| Sr. | Question |
|-----|----------|
| No. |          |

While walking on smooth surface one should take small steps to ensure 1. Large friction Small friction (A) (B) Larger normal force (C) Smaller normal force (D) 2. What happens to a vehicle travelling in an unbanked curved path if the friction between the road and tires suddenly disappears Moves along tangent Moves radially in (A) (B) (C) Moves radially out Moves along the curve (D) A ball of mass 0.2 kg strikes an obstacle and moves at  $60^{\circ}$  to its initial direction. If its speed 3. changes from 20m/s to 10m/s the magnitude of impulse received by the ball is -----Ns (A)  $2\sqrt{7}$ (B)  $2\sqrt{3}$ (D) (C)  $2\sqrt{5}$  $3\sqrt{2}$ A spacecraft of mass 2000kg moving with 600 m/s suddenly explodes into two pieces. One piece 4. of mass 500 kg is stationary. The velocity of other part in m/s is (A) 600 (B) 800 1500 1000 (C) (D) 5. 16 kg 140 N 8 kg The force on 16 kg is.....? 4 kg 140N (A) (B) 120N 100N (C) 80N (D) A man of mass 40 kg is at rest between the walls. If coeff. of friction between man and wall is 6. 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



7.

| 8.  | Gravitational force between two bodies is F. The space around the mass is now filled with a liquid of specific gravity 3. The gravitational force will be |  |                               |  |  |
|-----|---|--|-------------------------------|--|--|
|     | (A)   | F/9  | (B)                           | 3F   |  |
|     | (C)   | F  | (D)                           | F/3  |  |
| 9.  | A man weighs 75 kg on the surface of earth. His weight on the geostationary satellite is  |  |                               |  |  |
|     | $(\mathbf{A})$  | infinity   | (B)                           | 150kg  |  |
|     | (C)   | 2010   | (D)                           | 75/2 Kg  |  |
| 10. | g at a $(\Lambda)$  | depth of 1600 km inside the earth in m/s/s is  | (D)                           | 7.25   |  |
|     | $(\mathbf{C})$  | 8.65   | (D)                           | 4.35   |  |
| 11. | A bloc<br>embec<br>(A)<br>(C)   | ck of mass 19 M is suspended by a string of l<br>ded in it. If the block completes the vertical<br>140<br>$20\sqrt{9.8}$ | ength<br>circle<br>(B)<br>(D) | 1m. A bullet of mass M hits it and gets<br>the velocity of bullet in m/s is<br>$20\sqrt{19.6}$<br>20 |  |
| 12. | A rub<br>impac  | ber ball falls from a height of 4m and rebound   | ds to 1                       | .5m. The % loss of energy during the   |  |
|     | (A)   | 20   | (B)                           | 62.5   |  |
|     | (C)   | 23   | (D)                           | 60   |  |
| 13. | 25 kg<br>requir   | of sand is deposited each second on a convey<br>ed to maintain the belt in motion is                                     | or bel                        | t moving at 10m/s. The extra power   |  |
|     | (A)   | 2600W<br>225W  | (B)                           | 250W<br>2500W  |  |
|     | (C)   | 525 W  | (D)                           | 2500 W   |  |
| 14. | A unit  | form rod of mass M and length L standing ve<br>ag at the bottom. The moment of inertia will                              | rticall <sub></sub>           | y on a horizontal floor falls without  |  |
|     | (A)   | $ML^2/3$   | (B)                           | $ML^2/6$   |  |
|     | (C)   | $ML^2/9$   | (D)                           | $ML^{2}/12$  |  |
| 15. | If the  | velocity of C.M of a rolling body is V, then v   | velocit                       | y of highest point in the body will be   |  |
|     | (A)   | $\sqrt{2V}$  | (B)                           | $V_{V/2}$  |  |
|     | (C)   | 2 V  | (D)                           | V/ VZ  |  |
| 16. | The an of the   | ngular momentum of two rotating bodies are<br>ir rotational K.E is   | equal.                        | If the ratio of their M.I is 1:4, the ratio  |  |
|     | (A) $(C)$   | 1:2  | (В)<br>(D)                    | 2.1<br>4·1   |  |
| 17  | The le  | and a function in a tank is fun. A hala 1 am <sup>2</sup> is   |                               | at the bettern. The rate of lashess in $m^3$   |  |
| 17. | /s is (t  | ake $g = 10 \text{ m/s/s}$   | made                          | at the bottom. The rate of leakage in m  |  |
|     | (A)   | 10-3   | (B)                           | 10-4   |  |
|     | (C)   | 10   | (D)                           | 10-2   |  |
| 18. | Two b $3/5^{\text{th}}$   | blocks A and B float in water. A floats with 1   | /4 <sup>th</sup> of           | its volume immersed and B floats with  |  |
|     | (A)   | 5:12   | (B)                           | 12:5   |  |
|     | (C)   | 3:20   | (D)                           | 20:3   |  |

| 19. | The terminal velocity of a spherical ball of lead of radius R is Vwhile falling through a viscous liquid varies with R such that |   |                 |  |  |  |
|-----|--|---|-----------------|--|--|--|
|     | (A)  | V/R is constant   | (B)             | VR is constant   |  |  |
|     | (C)  | V is constant   | (D)             | $V/R^2$ is constant  |  |  |
| 20. | A hyd<br>other   | raulic press uses a piston of 100 cm <sup>2</sup> to exert piston that supports a mass of 2000 kg is (tak                         | a force $g = 1$ | e of $10^7$ dynes on water. The area of the $10$ m/s/s)  |  |  |
|     | (A)  | $100 \text{cm}^2$   | (B)             | $10^9 \text{ cm}^2$  |  |  |
|     | (C)  | $2 \times 10^4 \text{ cm}^2$  | (D)             | $2 \times 10^{10} \text{ cm}^2$  |  |  |
| 21. | When<br>throug<br>The v  | kerosene and coconut oil of coeff. of viscosi<br>gh the same pipe, under same pressure differe<br>olume of kerosene that flows is | ty 0.00         | 02 and $0.0154$ Ns/m <sup>2</sup> are followed<br>and same time collects 1 lit of coconut oil. |  |  |
|     | (A)  | 5.5 lit   | (B)             | 6.6 lit  |  |  |
|     | (C)  | 7.7 lit   | (D)             | 8.8 lit  |  |  |
| 22. | There  | is a circular hole in metal plate. When the pl  | ate is ł        | neated the radius of the hole becomes  |  |  |
|     | (A)  | increased   | (B)             | decreased  |  |  |
|     | (C)  | unchanged   | (D)             | depends on metal   |  |  |
| 23. | Specit<br>given  | fic heat of a substance depends on 1. Nature of the substance   | of subs         | stance. 2. Mass of substance. 3. Heat  |  |  |
|     | (A)  | Only one is correct   | (B)             | Both 1 and 2 are correct   |  |  |
|     | (C)  | All are correct   | (D)             | Only 1 and 3 are correct   |  |  |
| 24. | In a g   | ive process dW=0, dq is <0 then for a gas   |                 |  |  |  |
|     | (A)  | Temperature increases   | (B)             | Volume decreases   |  |  |
|     | (C)  | Pressure increases  | (D)             | Pressure decreases   |  |  |
| 25. | The e  | fficiency of carnot engine depends on   |                 |  |  |  |
|     | (A)  | Working substance   | (B)             | Sink temperature   |  |  |
|     | (C)  | Source temperature  | (D)             | Both B and C   |  |  |
| 26. | A 200<br>with e  | turn coil of self inductance 30 mH carries a each turn of coil.   | curren          | t of 5 mA. Find the magnetic flux linked   |  |  |
|     | (A)  | $7.5 \times 10^{-7} \text{Wb}$  | (B)             | 1.6 x 10 <sup>-7</sup> Wb  |  |  |
|     | (C)  | $3 \ge 10^{-7} \text{Wb}$   | (D)             | 1.5 x 10 <sup>-7</sup> Wb  |  |  |
| 27. | The ir   | stantaneous value of current in an AC circuit<br>he current will be maximum?  | t is I =        | 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first  |  |  |
|     | (A)  | 1/100 s   | (B)             | 1/200 s  |  |  |
|     | (C)  | 1/500 s   | (D)             | 1 s  |  |  |
|     |  |   |                 |  |  |  |

28. What in electric system represents force in mechanical system ?

| (A) | L   | - | (B) | Ι |
|-----|-----|---|-----|---|
| (C) | 1/C |   | (D) | q |

A capacitor of 1 μF is charged with 0.01C of electricity. How much energy is stored in it?
(A) 30 J
(B) 40 J
(C) 50 J
(D) 60 J

30.An electromagnetic wave is travelling in vacuum with a speed of  $3 \ge 10^8$  m/s. Find the velocity in<br/>a medium having relative electric and magnetic permeability 2 and 1, respectively.(A)  $3/\sqrt{2} \ge 10^8$  m/s(B)  $1.5 \ge 10^8$  m/s(C)  $2 \ge 10^8$  m/s(D) No change

31. Trace the path of ray of light passing through a glass prism as shown in the figure. If the refractive index of glass is  $\sqrt{3}$ , find out the value of angle of emergence from prism.



32. Light wave from two coherent sources of intensities in ratio 64:1 produces interference. Calculate the ration of maximum and minima of the interference pattern.

| (A) | 8:1 | (B) | 64:1  |
|-----|-----|-----|-------|
| (C) | 9:7 | (D) | 81:49 |

33. In young's experiment, the width of the fringes obtained with light of wavelength 6000 A° is 2 mm. What will be the fringe width, if the entire apparatus is immersed in a liquid of refractive index 1.33?

| (A) | 1 mm | (B) | 1.5 mm |
|-----|------|-----|--------|
| (C) | 2 mm | (D) | 2.5 mm |

34. Unpolarised light is incident on plane glass surface. What should be the angle of incidence in degrees, so that the reflected and refracted rays are perpendicular to each other?

| (A) | 37 | (B) | 47 |
|-----|----|-----|----|
| (C) | 57 | (D) | 67 |

35. Determine the de-Broglie wavelength associated with an electron, accelerated through a potential difference of 100 V.

| (A) | 1.227A° | (B) | 12.27A°            |
|-----|---------|-----|--------------------|
| (C) | 122.7A° | (D) | 1227A <sup>o</sup> |

36. A particle with rest mass m<sub>0</sub> is moving with velocity c. What is the de-Broglie wavelength associated with it?

| (A) | infinity   | (B) | zero  |
|-----|------------|-----|-------|
| (C) | radio wave | (D) | X ray |

- Which among the following series gives visible light? 37.
  - Lyman (B) Balmer (A)
  - (C) Bracket

None of these (D)

38. Identify the logic operation performed by this circuit



The number of silicon atoms per m<sup>3</sup> is  $5 \ge 10^{28}$ . This is doped simultaneously with  $5 \ge 10^{22}$  atoms per m<sup>3</sup> of arsenic and  $5 \ge 10^{20}$  atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that 39.  $n = 1.5 \times 10^{16} \text{ m}^{-3}$ .

| (A) | $4.54 \ge 10^9 \text{m}^{-3}$   | (B) | $4.95 \times 10^{22} \text{m}^{-3}$ |
|-----|---------------------------------|-----|-------------------------------------|
| (C) | $1.5 \ge 10^{16} \text{m}^{-3}$ | (D) | $5 \ge 10^{28} \text{m}^{-3}$       |

Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre 40. on the positive charge side along the axial line.

| (A) | 4.5 x 10 <sup>5</sup> N/C  | (B) | $4.5 \times 10^{5} \text{NC}$ |
|-----|----------------------------|-----|-------------------------------|
| (C) | 4.5 x 10 <sup>-5</sup> N/C | (D) | 4.5 x 10 <sup>-5</sup> NC     |

- If the Gaussian surface is so chosen that there are some charges inside and some outside than the 41. electric field is due to
  - (A) Only inside charges (B)
  - All the charges (C)
- Only outside charges
- (D) Cannot determine

42. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



43. Net capacitance of 3 identical capacitor in series is 1  $\mu$ *F*. What is the net capacitance in  $\mu$ *F* if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

44. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

45. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

46.



6 PCA A

| 47. | Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find the midpoint of the axis between them if same current I flows through both loops. |   |  |  |  |
|-----|---|---|--|--|--|
|     | (A) $\mu_0 I/2^{3/2} r$<br>(C) $\mu_0 I/4\pi r$   | (B) $\mu_0 2 I/2^{3/2} r$<br>(D) Cannot be determined   |  |  |  |
| 48. | A block of mass 4 kg is kept on a rough horizont 0.8. If a force of 19 N is applied on the block par between the block and floor is:  | al surface. The coefficient of static friction is allel to the floor, then the force of friction  |  |  |  |
|     | (A) 19N<br>(C) 16N  | (B) 18 N<br>(D) 9.8N  |  |  |  |
| 49. | Current in a circuit falls steadily from 2A to 0A i<br>(A) 1H<br>(C) 3H   | <ul> <li>n 10 ms. Calculate L if emf induced is 200V.</li> <li>(B) 2H</li> <li>(D) 4H</li> </ul>  |  |  |  |
| 50. | Self inductance of the air core inductor increases<br>core. What is the relative permeability of the core<br>(A) 500<br>(C) 900   | from 0.01 mH to 10 mH on introducing an iron<br>e used?<br>(B) 800<br>(D) 1000  |  |  |  |
| 51. | Among the following, the most stable complex is<br>(A) $[Fe (H_2O)_6]^{3+}$<br>(C) $[Fe (C_2O_4)_3]^{3-}$   | (B) $[Fe (NH_3)_6]^{3+}$<br>(D) $[Fe (Cl)_6]^{3-}$  |  |  |  |
| 52. | Which is the correct coordination number (C.N)<br>metal atom in $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?<br>(A) C.N=3, O.N=+1<br>(C) C.N=6, O.N=+1  | <ul> <li>(B) C.N=4, O.N=+2</li> <li>(D) C.N=6, O.N=+3</li> </ul>  |  |  |  |
| 53. | In a solid, oxide ions are arranged in ccp, cations<br>cation B occupy one third of the octahedral voids<br>(A) ABO <sub>3</sub><br>(C) AB <sub>3</sub> O   | A occupy one sixth of the tetrahedral voids and<br>a. The formula of the solid is:<br>(B) A <sub>3</sub> BO<br>(D) A <sub>3</sub> B <sub>3</sub> O <sub>3</sub>         |  |  |  |
| 54. | On mixing acetone to methanol some of the hydr<br>Which of the following statements is correct abo  | ogen bonds between methanol molecules break.<br>ut the above process?   |  |  |  |
|     | <ul> <li>(A) At specific composition methanol acetone<br/>mixture will form minimum boiling<br/>azeotrope and show positive deviation<br/>from Raoult's law</li> </ul>                                    | (B) At specific composition methanol<br>acetone mixture will form maximum<br>boiling azeotrope and show positive<br>deviation from Raoult's law                         |  |  |  |
|     | (C) At specific composition methanole<br>acetone mixture will form minimum<br>boiling azeotrope and show negative<br>deviation from Raoult's law  | <ul> <li>(D) At specific composition methanole<br/>acetone mixture will form maximum<br/>boiling azeotrope and show negative<br/>deviation from Raoult's law</li> </ul> |  |  |  |
| 55. | $K_{\rm H}$ value for argon, carbon dioxide, formaldehyd and 0.413, respectively. The correct arrangement solubility is:  | e and methane gases are 40.39, 1.67, 1.83 X 10 <sup>-5</sup> of these gases in the order of their increasing  |  |  |  |
|     | (A) formaldehyde <methane<carbon<br>dioxide<argon< td=""><td>(B) formaldehyde&lt; carbon dioxide<br/><methane<argon< td=""></methane<argon<></td></argon<></methane<carbon<br>                            | (B) formaldehyde< carbon dioxide<br><methane<argon< td=""></methane<argon<>   |  |  |  |
|     | (C) argon <carbon dioxide<<br="">methane<formaldehyde< td=""><td>(D) argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane></td></formaldehyde<></carbon>                | (D) argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane>   |  |  |  |

| 56. | The number of faradays of electricity required for electrolytic conversion of the mole of nitrobenzene to aniline is: |   |   |  |  |
|-----|---|---|---|--|--|
|     | (A) 3F  | (B) 4F  |   |  |  |
|     | $(C) \qquad 6F$   | (D) 5F  |   |  |  |
|     |   |   |   |  |  |
| 57. | The positive value of the standard electrode poter  | ntial of $Ag^+/Ag$ indicates that:  |   |  |  |
|     | (A) This redox couple is a stronger reducing  | (B) This redox couple is a stronger   |   |  |  |
|     | agent than $H^+/H_2$ couple   | oxidizing agent than $H^+/H_2$ couple   |   |  |  |
|     | (C) Ag can displace $H_2$ from acid   | (D) Ag can displace $H_2$ from base   |   |  |  |
| 58  | Milk is refrigerated in order to slow the rate of de  | ecomposition by bacterial action. The decrease in                                     | n |  |  |
| 20. | reaction rate is due to:  |   | • |  |  |
|     | (A) A decrease in surface area  | (B) A decrease in $\triangle$ H for the reaction                                      |   |  |  |
|     | (C) A decrease in the fraction of particles   | (D) The introduction of an alternative  |   |  |  |
|     | possessing sufficient energy  | pathway with greater activation   |   |  |  |
|     |   | energy.   |   |  |  |
| 59. | Which of the following statements is not correct?   | 2   |   |  |  |
|     | (A) The rate of a reaction decreases with   | (B) The instantaneous rate a reaction is  |   |  |  |
|     | passage of time as concentration of   | same at any time during the reaction  |   |  |  |
|     | reactants decrease $(C)$ For a zero order reaction the  | (D) The rate of a reaction decreases with   |   |  |  |
|     | (C) For a zero order reaction the<br>concentration of reactants remains   | (D) The face of a reaction decreases with<br>increase in concentration of reactant (s | ) |  |  |
|     | changed with passage of time  | increase in concentration of reactant (s  | , |  |  |
| 60. | Which of the following gases shows the lowest a   | dsorption per gram of charcoal? The critical  |   |  |  |
|     | temperatures are given in parenthesis:  |   |   |  |  |
|     | (A) $H_2(33K)$  | (B) $CH_4(190K)$  |   |  |  |
|     | (C) $SO_2(630K)$  | (D) $CO_2(304K)$  |   |  |  |
| 61  | Froundlich advantion isotherm is given by the ev  | $w$ procession $w/m = kn^{1/n}$ W/bish of the following                               |   |  |  |
| 01. | statements are false?   | cpression x/m-kp : which of the following   |   |  |  |
|     | i. When $1/n=0$ , the adsorption is independent   | endent of pressure.   |   |  |  |
|     | ii. When n=0, the plot of $x/m$ vs p graph  | h is a line parallel to x axis.   |   |  |  |
|     | iii. When 1/n=0, the adsorption is directly   | ly proportional to pressure.  |   |  |  |
|     | iv. When $n=0$ , plot of $x/m$ vs p is a curve  | e   |   |  |  |
|     | (A) i and ii  | (B) ii and iv   |   |  |  |
|     | (C) 1 and 111   | (D) all are false   |   |  |  |
| ()  |   |   |   |  |  |

- In the extraction of chlorine by electrolysis of an aqueous solution of sodium chloride, which of the following statements are true? i.  $\Delta G^0$  for the overall reaction is positive ii.  $\Delta G^0$  for the overall reaction is negative iii.  $E^0$  for the overall reaction is positive iv.  $E^0$  for the overall reaction is negative 62.

  - (A) i and iii i and iv (B)
  - (C) ii and iii (D) iii and iv

| 63. | Which                      | of the following pairs of ions are isoelectror   | nic and                     | l isostructural ?   |
|-----|----------------------------|--|-----------------------------|---|
|     | (A)                        | $NO_2^+$ and $NO_3^-$  | (B)                         | $\text{ClO}_3^-$ and $\text{ICl}_4^-$   |
|     | (C)                        | $XeO_3^{2-}$ and $PCl_3$   | (D)                         | $\text{ClO}_3^-$ and $\text{SO}_3^{2-}$   |
| 64. | Which                      | of the following hydrides is the strongest red   | ducing                      | g agent?  |
|     | (A)                        | NH <sub>3</sub>  | (B)                         | PH <sub>3</sub>   |
|     | (C)                        | AsH <sub>3</sub>   | (D)                         | SbH <sub>3</sub>  |
| 65. | Consid                     | er the reactions,  |                             |   |
|     | i.                         | $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (N)$  | $(O_3)_2 +$                 | $-X + H_2O$   |
|     | ii.                        | $Zn + dil. HNO_3 (cold) \longrightarrow Zn (N)$  | $(O_3)_2 -$                 | + Y + H <sub>2</sub> O  |
|     | (A)                        | NO NO  | $(\mathbf{B})$              | NO. NO.   |
|     | $(\Gamma)$                 | $N_2O, NO$   | $(\mathbf{D})$              | NO NO   |
|     | (C)                        | 1v <sub>2</sub> , 1v <sub>2</sub> O  | (D)                         | 1102, 110   |
| 66. | When H<br>mangar           | KMnO <sub>4</sub> acts as an oxidizing agent in weakly<br>nese decreases by:   | alkali                      | ne medium, the oxidation number of  |
|     | (A)                        | 1  | (B)                         | 2   |
|     | (C)                        | 3  | (D)                         | 5   |
| 67. | Acidifi<br>formati         | ed potassium dichromate solution turns gree  | en whe                      | n $Na_2SO_3$ is added to it due to the  |
|     | (A)                        | CrSO <sub>4</sub>  | (B)                         | $Cr_2(SO_4)_2$  |
|     | $(\mathbf{C})$             | $\operatorname{Cr}\Omega_{4}^{2}$  | (D)                         | $Cr_2(SO_2)_2$  |
|     | (0)                        |  | (D)                         | 612(003)3   |
| 68. | The d-e<br>Which<br>number | electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ arone of the following complexes will exhibit rs of Cr=24, Mn=25, Fe=26, Co=27) | nd Co <sup>2</sup><br>minin | <sup>++</sup> are d <sup>4</sup> , d <sup>5</sup> , d <sup>6</sup> and d <sup>7</sup> , respectively.<br>num paramagnetic behavior? (atomic |
|     | (A)                        | $[Cr(H_2O)_6]^{2+}$  | (B)                         | $[Mn(H_2O)_6]^{2+}$   |
|     | (C)                        | $[Fe(H_2O)_6]^{2+}$  | (D)                         | $[Co(H_2O)_6]^{2+}$   |
| 69. | When 2<br>is:              | 2-Bromopentane is heated with potassium et   | hoxid                       | e in ethanol, the major product obtained  |
|     | (A)                        | 2-Ethoxypentane  | (B)                         | Pent-1-ene  |
|     | (C)                        | Cis-Pent-2-ene   | (D)                         | Trans-Pent-2-ene  |
| 70. | Which                      | of the following undergoes nucleophilic sub  | stituti                     | on exclusively by $S_N^1$ mechnism?   |
|     | (A)                        | Chloroethane   | (B)                         | Isopropyl chloride  |
|     | (C)                        | Chlorobenzene  | (D)                         | Benzyl chloride   |
| 71. | The nu                     | mber of possible stereoisomers for CH <sub>3</sub> CH=   | CHCH                        | H <sub>2</sub> CH(Br)CH <sub>3</sub> is:  |
|     | (A)                        | 8  | (B)                         | 2   |
|     | (C)                        | 4  | (D)                         | 6   |
| 72. | 2-Meth                     | oxy-2-methylpropane on heating with HI pr  | oduce                       | s:  |
|     | (A)                        | Methanol and sec-propyl iodide   | (B)                         | Methyl iodide and tert-butyl alcohol  |
|     | (C)                        | Methyl iodide and isobutene  | (D)                         | Methanol and tet-butyl iodide   |
| 73. | The lea                    | st acidic compound among the following is:   |                             |   |
|     | (A)                        | o-Nitrophenol  | (B)                         | m-Nitrophenol   |
|     | (C)                        | p-Nitrophenol  | (D)                         | Phenol  |
|     |                            |  |                             |   |

| 74. | An alkene $C_7H_{14}$ on reductive ozonolysis gives an aldehyde with formula $C_3H_6O$ and a ketone.<br>The ketone is:                 |  |   |  |  |  |  |
|-----|--|--|---|--|--|--|--|
|     | (A) 2-Butanone   |  | (B)   | 2-Pentanone                                      |  |  |  |
|     | (C) 3-Pentanone  |  | (D)   | Propanone  |  |  |  |
| 75. | The increasing order of the rate of addition of HCN to the compounds i) Formaldehyde ii)<br>Acetone iii) Acetophenone iv) benzophenone |  |   |  |  |  |  |
|     | (A)  i < ii < iii < iv   |  | (B)   | iv < ii < iii < i                                |  |  |  |
|     | (C) $iv < iii < ii < i$  |  | (D)   | iv< i< ii< iii                                   |  |  |  |
| 76. | 76. The carboxylic acid that does not undergo Hell-Vohlard-Zelinsky reaction is  |  |   |  |  |  |  |
|     | (A) CH <sub>3</sub> COOH   | -  | (B)   | (CH <sub>3</sub> ) <sub>2</sub> CHCOOH           |  |  |  |
|     | (C) $CH_3CH_2CH_2$   | СООН   | (D)   | (CH <sub>3</sub> ) <sub>3</sub> CCOOH            |  |  |  |
| 77. | NaNO <sub>2</sub> /  | $\stackrel{\text{(HCl}}{\longrightarrow} X \stackrel{P/Br_2}{\longrightarrow} Y \stackrel{\text{NH}_3}{\longrightarrow}$ | Z   |  |  |  |  |
|     | - 22   | (excess)   | _   |  |  |  |  |
|     | In the above sequen  | ice, Z is:   | (7)   |  |  |  |  |
|     | (A) cyanoethane  |  | (B)   | ethanamide                                       |  |  |  |
|     | (C) methanamin   | e  | (D)   | etnanamine                                       |  |  |  |
| 78. | The attachment of v value?   | which of the following group at  | para p  | osition in aniline will raise the K <sub>b</sub> |  |  |  |
|     | (A) $-SO_3H$   |  | (B)   | -OH  |  |  |  |
|     | (C) –F   |  | (D)   | -Br  |  |  |  |
| 79. | Which of the follow  | ving is an example of globular   | orotein                                       | ?  |  |  |  |
|     | (A) myosin   |  | (B)   | collagen   |  |  |  |
|     | (C) keratin  |  | (D)   | haemoglobin                                      |  |  |  |
| 80. | Which one of the fo  | llowing is synthesized in our b  | ody by  | y sun rays?                                      |  |  |  |
|     | (A) Vitamin D  | 2  | (B)   | Vitamin B  |  |  |  |
|     | (C) Vitamin K  |  | (D)   | Vitamin A  |  |  |  |
| 81  | Caprolactum is the   | is the starting material for the s   | vnthes  | is of  |  |  |  |
|     | (A) Nylon-6  |  | (B)   | Nylon6,6   |  |  |  |
|     | (C) Terylene   |  | (D)   | Nylon 10   |  |  |  |
| 82  | The species which a  | can serve as an initiator for cati   | onic no                                       | olymerization is                                 |  |  |  |
| 02. | (A) Lithium alur   | ninium hydride   | (B)   | Nitric acid                                      |  |  |  |
|     | (C) Aluminium  | chloride   | (D)   | BuLi   |  |  |  |
| 82  | Aspirin is on:   |  |   |  |  |  |  |
| 05. | (A) analogsic  |  | (B)   | antipyretic                                      |  |  |  |
|     | (C) antimalarial   |  | (D)   | Both analgesic and antipyretic                   |  |  |  |
| 0.4 |  | o  |   |  |  |  |  |
| 84. | The equivalent mas $(A)$ Up 16 - 6 it - 4  | s of iron in the reaction $2Fe + 3$  | $\operatorname{SCl}_2 \rightarrow \mathbb{C}$ | · 2FeCl <sub>3</sub> 1S:                         |  |  |  |
|     | (A) Fiall OI Its at $(C)$ Same as atom   | onne mass  | (D)<br>(B)                                    | One fourth of its atomic mass                    |  |  |  |
|     | (C) Same as atom   | 1110 111855  | (D)   | one routin of its atollite mass                  |  |  |  |

| 85.         | Which o                          | f the following sets of quantum numbers is  | s corre           | ect for an electron in 4f subshell?                                      |
|-------------|----------------------------------|---|-------------------|--|
|             | (A) n=                           | =4, 1=3, m=4, s=+1/2  | <b>(B)</b>        | n=4, $l=3$ , $m=-4$ , $s=-1/2$   |
|             | (C) n <sup>2</sup>               | =4, l=3, m=+1, s=+1/2   | (D)               | n=3, $l=2$ , $m=-2$ , $s=+1/2$   |
|             |                                  |   |                   |  |
| 86.         | The corr                         | ect sequence of atomic radii is:  |                   |  |
|             | (A) N                            | la>Mg>Al>Si   | (B)               | Al>Si>Na>Mg  |
|             | (C) S                            | i>Al>Mg>Na  | (D)               | Si>Al>Na>Mg  |
| 87          | In which                         | of the following the bond angle around the  | ie cen            | tral atom is maximum?  |
| 07.         | $(\Delta)$ N                     | H <sub>a</sub>  | (B)               | NH <sup>+</sup>  |
|             | $(\Gamma)$ P                     | Cl <sub>2</sub>   | (D)               | SC1  |
|             | (C) 1                            |   | (D)               | 5612   |
| 88.         | Which o                          | f the following molecule does not exist   |                   |  |
|             | (A) N                            | F <sub>3</sub>  | (B)               | NF5  |
|             | (C) P                            | F <sub>5</sub>  | )                 | N <sub>2</sub> H <sub>4</sub>  |
|             | (0) 1                            | - 5   | (2)               |  |
| 89.         | If helium                        | n is allowed to expand in vacuum, it liberat  | tes hea           | at because   |
|             | (A) It                           | is an inert gas   | (B)               | It is an ideal gas   |
|             | (C) It                           | s critical temp. is low   | (D)               | It is a light gas  |
|             |                                  | I   |                   | 6 6  |
| 90.         | i) H <sub>2</sub> (g) -          | $+ 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ ii) $H_2(g) +$   | 1/2O <sub>2</sub> | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two                     |
|             | reactions                        | с, с  |                   |  |
|             | (A) x                            | > y   | (B)               | x < y  |
|             | (C) x                            | = y   | (D)               | $\mathbf{x} + \mathbf{y} = 0$  |
|             |                                  |   |                   |  |
| 91.         | If the bo                        | nd dissociation energies of XY, $X_2$ , $Y_2$ (all  | diato             | mic molecules) are in the ratio 1:1:0.5,                                 |
|             | respectiv                        | vely and $\Delta_{\rm f}$ H of XY is -200KJmol <sup>-1</sup> , the box                                      | nd dis            | sociation energy of $X_2$ will be:                                       |
|             | (A) 4                            | 00 KJmol <sup>-1</sup>  | (B)               | 300 KJmol <sup>-1</sup>  |
|             | (C) 20                           | 00 KJmol <sup>-1</sup>  | (D)               | $100 \text{ KJmol}^{-1}$   |
| 02          | What wi                          | Il ha the correct order of vanour programs  | fwate             | $r$ other at $20^{0}$ C $r$          |
| 92.         | among th                         | If be the correct order of vapour pressure of   | n wale            | int and other has minimum boiling point                                  |
|             | $(\Lambda)$ W                    | Veter ether etherol   | $(\mathbf{D})$    | Water athenal athar  |
|             | (A) W                            |   | (D)               |  |
|             | (C) E                            | ther <ethanoi<water< td=""><td>(D)</td><td>Etnanoi<etner<water< td=""></etner<water<></td></ethanoi<water<> | (D)               | Etnanoi <etner<water< td=""></etner<water<>                              |
| 93          | Which o                          | f the following will occur if a 0.1M solution   | on of a           | weak acid is diluted to 0.01M at   |
| <i>))</i> . | constant                         | temperature?  | /// UI u          | weak dold is dilated to 0.01111 at                                       |
|             | (A) []                           | $H^+$ will decrease to 0 001M   | (B)               | pH will decrease   |
|             | $(\Gamma)$ $(\Gamma)$ $(\Gamma)$ | ercentage ionization will increase  | (D)               | K will increase  |
|             | (0) 1                            | ereenuge forization with mereuse  | (D)               | Ka win increase  |
| 94.         | Which o                          | f the following species involves the transfe  | er of 5           | N <sub>A</sub> electrons per mole of it ?                                |
|             | (A) N                            | $\ln O_4^2 \rightarrow Mn O_4^2$  | (B)               | $MnO_4 \rightarrow Mn^{2+}$  |
|             | (C) M                            | $\ln O_4 \rightarrow MnO_2$   | (D)               | $\operatorname{CrO_4}^{\overline{2}} \rightarrow \operatorname{Cr}^{3+}$ |
|             | (2) 10                           |   | (2)               |  |
|             |                                  |   |                   |  |

| 95.  | 30-vo      | lume hyderogen peroxide means:   |                |  |
|------|------------|--|----------------|--|
|      | (A)        | 30% H <sub>2</sub> O <sub>2</sub> by volume                                    | (B)            | $30g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } H_2O_2 \text{ solution containing } 1g  solution $ |
|      | (C)        | 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ gas at STP | (D)            | $30 \text{ cm}^3$ of the solution contains one mole of $H_2O_2$  |
| 96.  | The co     | orrect sequence of covalent character is repre                                 | sented         | by:  |
|      | (A)<br>(C) | LiCl <nacl<becl<sub>2<br/>NaCl<licl< becl<sub="">2</licl<></nacl<becl<sub>     | (B)<br>(D)     | BeCl <sub>2</sub> <licl<nacl<br>BeCl<sub>2</sub><nacl< licl<="" td=""></nacl<></licl<nacl<br>  |
| 97.  | Whick      | h of the following is known as pyrene?   |                |  |
|      | (A)        | CCl <sub>4</sub>   | (B)            | CS <sub>2</sub>  |
|      | (C)        | $S_2Cl_2$  | (D)            |  |
| 98.  | The m      | nost stable carbocation amongst the following                                  | g is:          |  |
|      | (A)        | $(CH_3)_2CH^+$   | (B)            | $Ph_3C^+$  |
|      | (C)        | CH <sub>3</sub> CH <sub>2</sub>  | (D)            | $CH_2 - CH - CH_2$   |
| 99.  | The m      | nolecule that will have dipole moment is:                                      |                |  |
|      | (A)        | 2,2-Dimethylpropane  | (B)            | Cis-2-Butene   |
|      | (C)        | Trails-2-Dutene  | (D)            | 2,2,3,5-1 ett alletti yloutaile  |
| 100. | Of the     | e five isomeric hexanes, the isomer which car                                  | n give 1       | two monochlorinated compound is:   |
|      | (A)        | 2-Methylpentane  | (B)            | 2,2-Dimethylbutane   |
|      | (C)        | 2,5-Dimetryloutane   | (D)            | n-nexane   |
| 101. | Cross      | sing over occurs in meiosis I during:  |                |  |
|      | (A)        | Metaphase  | (B)            | Telophase  |
|      | (C)        | Anaphanse  | (D)            | Pachytene  |
| 102. | Powe       | er house of the cell:  |                |  |
|      | (A)        | Golgi body   | (B)            | Ribosomes  |
|      | (C)        | Mitochondria   | (D)            | Lysosomes  |
| 103  | Gene       | tics is the study of   |                |  |
| 1001 | (A)        | Heredity   | (B)            | Variation  |
|      | (C)        | Both A and B   | (D)            | None of these  |
| 104  | In cos     | , linked inheritance, characters are needed                                    | d from         | n father to the grandsons through his  |
| 104. | (A)        | Daughter   | (B)            | Son  |
|      | (C)        | Both daughter and son  | (D)            | Any of them  |
| 105  |            |  |                |  |
| 105. | Whic       | h of the following bases is not present in                                     | $(\mathbf{P})$ | Thymine  |
|      | (A)        | Adenine  | (D)<br>(D)     | Cvtosine   |
|      | (-)        |  | (2)            | - )  |

| 106. | <ul><li>Mendel's principle of independent assortment c</li><li>(A) Monohybrid cross</li><li>(C) Both A and B</li></ul>            | can be<br>(B)<br>(D) | demonstrated through:<br>Dihybrid cross<br>Any of them     |
|------|---|----------------------|--|
| 107. | <ul> <li>On hydrolysis, maltose gives</li> <li>(A) glucose + glucose</li> <li>(C) glucose + fructose</li> </ul>                   | (B)<br>(D)           | glucose + lactose<br>glucose + galactose                   |
| 108. | <ul><li>A dipeptide has peptide bonds.</li><li>(A) Three</li><li>(C) Two</li></ul>  | (B)<br>(D)           | One<br>None of them  |
| 109. | <ul><li>Which vitamin can be synthesized by green plabut not by mammals?</li><li>(A) Ascorbic acid</li><li>(C) Thiamine</li></ul> | nts ar<br>(B)<br>(D) | nd various micro-oraganisms<br>Pantothenic acid<br>Retinol |
| 110. | <ul><li>Bacterial cell wall is made up of:</li><li>(A) Chitin</li><li>(C) Peptidoglycan</li></ul>                                 | (B)<br>(D)           | Cellulose<br>All the above                                 |
| 111. | <ul><li>Plant viruses are generally of:</li><li>(A) RNA</li><li>(C) mRNA</li></ul>  | (B)<br>(D)           | DNA<br>tRNA  |
| 112. | <ul><li>Gram positive aerobic, filamentous bacteria wi</li><li>(A) Algae</li><li>(C) Bacteria</li></ul>                           | th hyp<br>(B)<br>(D) | bhae are known as:<br>Actinomycetes<br>Fungi               |
| 113. | <ul><li>Conversion of organic matter in to simple inorg</li><li>(A) Immobilization</li><li>(C) Co<sub>2</sub> fixation</li></ul>  | ganic<br>(B)<br>(D)  | forms is called:<br>Mineralization<br>Nitrification        |
| 114. | Excess carbon (> C/N ratio) leads to rate of dec<br>(A) Slow<br>(C) Optimum   | compo<br>(B)<br>(D)  | osition:<br>Fast<br>None                                   |
| 115. | <ul> <li>N<sub>2</sub> fixing cells of cyanobacteria are known as:</li> <li>(A) Cyst</li> <li>(C) Spores</li> </ul>               | (B)<br>(D)           | Akinetes<br>Heterocyst                                     |
| 116. | Livestock is important source of:<br>(A) Milk<br>(C) Manure   | (B)<br>(D)           | Meat<br>All of these                                       |
|      |   |                      |  |

| 117. | <ul><li>Dairy cattle and buffalo can be called as:</li><li>(A) Caprine</li><li>(C) Bovine</li></ul>         | (B)<br>(D)             | Ovine<br>Equine                  |
|------|---|------------------------|----------------------------------|
| 118. | <ul><li>Best breed of buffalo in India:</li><li>(A) Nili Ravi</li><li>(C) Surti</li></ul>                   | (B)<br>(D)             | Murrah<br>Toda                   |
| 119. | <ul><li>Best layer poultry strain is:</li><li>(A) WLH</li><li>(C) Karaknath</li></ul>                       | (B)<br>(D)             | Minorca<br>Sutlez                |
| 120. | Normal birth weight (Kg) of healthy buffalo<br>(A) 20<br>(C) 40   | calf is:<br>(B)<br>(D) | 30<br>50                         |
| 121. | Number of teats in buffalo:<br>(A) 2<br>(C) 6   | (B)<br>(D)             | 4<br>8                           |
| 122. | Dry matter requirement (kg) of a cow weighin<br>(A) 8<br>(C) 12   | ng 400<br>(B)<br>(D)   | kg is:<br>10<br>14               |
| 123. | <ul> <li>Green fodder requirement of adult cattle (kg)</li> <li>(A) 30</li> <li>(C) 50</li> </ul>           | (B)<br>(D)             | 40<br>60                         |
| 124. | <ul><li>Which of the following crops is the best for h</li><li>(A) Jowar</li><li>(C) Berseem</li></ul>      | ay mak<br>(B)<br>(D)   | cing:<br>Bajra<br>Oat            |
| 125. | Normal body temperature of healthy poultry l<br>(A) 37.0<br>(C) 107.0                                       | oird (°H<br>(B)<br>(D) | <sup>3</sup> ):<br>98.6<br>117.0 |
| 126. | <ul><li>ICAR-National Dairy Research Institute (ND</li><li>(A) Karnal</li><li>(C) Bareilly</li></ul>        | RI) is l<br>(B)<br>(D) | ocated at:<br>New Delhi<br>Anand |
| 127. | <ul><li>Excessive gas accumulation in rumen indicate</li><li>(A) Impaction</li><li>(C) Milk fever</li></ul> | es:<br>(B)<br>(D)      | Bloat<br>Foot and Mouth Disease  |
|      |   |                        |                                  |

| 128. | <ul><li>Most fatal disease in farm animals is:</li><li>(A) Foot and Mouth Disease</li><li>(C) Rinderpest</li></ul>                                    | (B)<br>(D)              | HS<br>Anthrax  |
|------|---|-------------------------|--|
| 129. | Semen is stored in liquid nitrogen at (°C):<br>(A) -79<br>(C) 79  | (B)<br>(D)              | -196<br>196  |
| 130. | <ul><li>During Artificial Insemination (AI) semen sl</li><li>(A) Vagina</li><li>(C) Uterus</li></ul>  | hould be<br>(B)<br>(D)  | e deposited<br>Cervix<br>Fallopian tube  |
| 131. | <ul> <li>Seeds of groundnut contain about:</li> <li>(A) 25% oil and 50% protein</li> <li>(C) 40% oil and 40% protein</li> </ul>                       | (B)<br>(D)              | 20% oil and 40% protein<br>50% oil and 25% protein   |
| 132. | <ul><li>Organic carbon is a measure of</li><li>(A) Available nitrogen in soil</li><li>(C) Excess of carbon in soil</li></ul>                          | (B)<br>(D)              | Available nutrient in soil<br>Excess of iron in soil   |
| 133. | <ul><li>Which among the following element is consistent.</li><li>(A) Calcium</li><li>(C) Nitrogen</li></ul>   | idered ir<br>(B)<br>(D) | nmobile in the plant<br>Phosphorus<br>Magnesium  |
| 134. | <ul><li>Which among the following is recommended</li><li>(A) HD 2960</li><li>(C) PBW 725</li></ul>  | d variety<br>(B)<br>(D) | of durum wheat:<br>WH 896<br>WH 711  |
| 135. | Recommended dose of nutrients for berseem<br>(A) $10 \text{ kg N}, 28 \text{ kg P}_2\text{O}_5$<br>(C) $20 \text{ kg N}, 40 \text{ kg P}_2\text{O}_5$ | (kg/acr<br>(B)<br>(D)   | e) is:<br>40 kg N, 25 kg P <sub>2</sub> O <sub>5</sub><br>20 kg N, 20 kg P <sub>2</sub> O <sub>5</sub> |
| 136. | Optimum row spacing for cotton is:<br>(A) 50 cm<br>(C) 67.5 cm  | (B)<br>(D)              | 60 cm<br>75 cm   |
| 137. | <ul><li>Optimum sowing time of summer moong in</li><li>(A) March</li><li>(C) First fortnight of April</li></ul>                                       | the state<br>(B)<br>(D) | e is:<br>Second fortnight of February<br>End June-early July   |
| 138. | <ul><li>'White alkali' soil refers to:</li><li>(A) Acid soil</li><li>(C) Salina sodic soil</li></ul>  | (B)<br>(D)              | Saline soil<br>Sodic soil  |
| 139. | The exchange sodium percentage (ESP) of a (A) More than 15  | lkali soi<br>(B)        | ls is always:<br>Any value   |

| 140. | ICAR   | -Central Arid Zone Research Institute is   | s locat  | ed at:                       |
|------|--------|--|----------|------------------------------|
|      | (A)    | Nagpur                                     | (B)      | Hyderabad                    |
|      | (C)    | New Delhi                                  | (D)      | Jodhpur                      |
| 141. | India  | is divided in to ecological zones.         |          |                              |
|      | (A)    | 12   | (B)      | 10                           |
|      | (C)    | 15   | (D)      | 20                           |
| 142. | Reco   | mmended seed rate (kg/ha) of dhaincha o    | or sunł  | nemp for green manuring is:  |
|      | (A)    | 20   | (B)      | 30                           |
|      | (C)    | 40   | (D)      | 50                           |
| 143. | Reco   | mmended seed rate for spring season mu     | ngbea    | n is                         |
|      | (A)    | 15-20 kg per acre                          | (B)      | 25-30 kg per hectare         |
|      | (C)    | 15-20 kg per hectare                       | (D)      | 10 kg per hectare            |
| 144. | For tr | ansplanting of pearl millet (bajra) in Har | yana,    | optimum age of seedlings is: |
|      | (A)    | Two weeks                                  | (B)      | Three weeks                  |
|      | (C)    | Four weeks                                 | (D)      | Five weeks                   |
| 145. | Blind  | tillage refers to:                         |          |                              |
|      | (A)    | Summer ploughing                           | (B)      | Primary tillage              |
|      | (C)    | Hoeing before germination                  | (D)      | Hoeing in standing crop rows |
| 146. | Flame  | e photometer is used for the determinatio  | n of:    |                              |
|      | (A)    | Nitrogen                                   | (B)      | Phosphorus                   |
|      | (C)    | Potassium                                  | (D)      | Boron                        |
| 147. | Tetra  | zolium test is conducted to test the:      |          |                              |
|      | (A)    | Physical purity of seed                    | (B)      | Percentage of weed seeds     |
|      | (C)    | Viability of seed                          | (D)      | Seed germination             |
| 148. | World  | d Food Day is celebrated on:               | <u> </u> |                              |
|      | (A)    | 5 June                                     | (B)      | 20 June                      |
|      | (C)    | 28 February                                | (D)      | 16 October                   |
| 149. | Whic   | h among the following is the best and ch   | eapest   | method of weed control:      |
|      | (A)    | Cultural measures                          | (B)      | Herbicide based weed control |
|      | (C)    | Biological control                         | (D)      | Preventive measures          |
| 150. | Black  | soils in India belong to soil order:       |          | · · · ·                      |
|      | (A)    | Alfisol                                    | (B)      | Inceptisol                   |
|      | (C)    | vertisol                                   | (D)      | UXISOI                       |
| 151. | Whic   | h among the following crop has epigeal g   | germir   | nation?                      |
|      | (A)    | Sunilower                                  | (B)      | Unickpea                     |
|      | (C)    | Kice                                       | (D)      | Pearl millet                 |

| 152. | Which                | h fraction of soil organic matter is soluble  | e in bo              | oth alkali and acid:                                     |
|------|----------------------|---|----------------------|--|
|      | (A)                  | Humic acid  | (B)                  | Fulvic acid  |
|      | (C)                  | Hymatomelonic acid  | (D)                  | Humin acid   |
| 153. | Nitro<br>(A)<br>(C)  | gen use efficiency in rice can be increased<br>Delayed application of N<br>Application of S-coated urea | l by:<br>(B)<br>(D)  | Use of biofertilizers<br>Application of blue green algae |
| 154. | Which                | h stage of sugarcane is most critical for in  | rigatio              | on?  |
|      | (A)                  | Germination   | (B)                  | Formative stage  |
|      | (C)                  | Grand growth phase  | (D)                  | Ripening stage   |
| 155. | The la<br>(A)<br>(C) | argest producer of rapeseed-mustard in In<br>Haryana<br>Rajasthan                                       | dia is<br>(B)<br>(D) | Uttar Pradesh<br>Gujarat                                 |
| 156. | The to<br>(A)<br>(C) | erm Functional or Metabolic Nutrients wa<br>JV Leibig<br>DI Arnon                                       | (B)<br>(D)           | posed by:<br>DJ Nicholas<br>Mosanoba Fukuoka             |
| 157. | Botar<br>(A)<br>(C)  | iical name of sunnhemp is<br>Sesbania aculeata<br>Carthamus tinctorium                                  | (B)<br>(D)           | Trifolium alexandrinum<br>Crotolaria juncea              |
| 158. | The u                | pper limit of soil moisture available for p   | lant g               | rowth is:  |
|      | (A)                  | PWP (15 bars)   | (B)                  | Hygroscopic coefficient                                  |
|      | (C)                  | Field capacity (1/3 bars)   | (D)                  | Gravitational potential                                  |
| 159. | For w                | hich fertilizer, India is fully dependent or  | n impo               | ort?   |
|      | (A)                  | N fertilizers   | (B)                  | K fertilizers  |
|      | (C)                  | P fertilizers   | (D)                  | S fertilizers  |
| 160. | Agros                | stology is the branch of Agronomy that de   | eals w               | ith cultivation of:                                      |
|      | (A)                  | Aromatic and medicinal crops  | (B)                  | Non edible oilseeds                                      |
|      | (C)                  | Fodder crops  | (D)                  | Green manure crops                                       |
| 161. | With                 | excessive use of nitrogen in sugarcane, th  | e sug                | ar content in juice is:                                  |
|      | (A)                  | Increased   | (B)                  | Remains same   |
|      | (C)                  | Decreased   | (D)                  | Not affected   |
| 162. | Bacte                | ria responsible for nitrogen fixation in so   | ybean                | is   |
|      | (A)                  | <i>Rhizobium leguminosarum</i>  | (B)                  | Rhizobium japonicum                                      |
|      | (C)                  | <i>Rhizobium phaseoli</i>   | (D)                  | Rhizobium trifoli  |
| 163. | The n<br>(A)<br>(C)  | nost critical stage of irrigation in maize is<br>Silking stage<br>Grain development stage               | :<br>(B)<br>(D)      | Tasseling stage<br>Dough stage                           |
| 164. | Nippi<br>(A)<br>(C)  | ng in chickpea is beneficial to:<br>Promote branching<br>Check excessive vegetative growth              | (B)<br>(D)           | Promote flowering<br>Improve seed setting                |

| 165. | Quantity of urea required by<br>(A) 130                            | wheat for one acre at a (B) | dose of 125 kg per hectare is:<br>90 |
|------|--|-----------------------------|--------------------------------------|
|      | (C) 110  | (D)                         | 275                                  |
| 166. | Congress grass (Parthenium   | hysterophorus) can be       | controlled by insect:                |
|      | (A) Chrysoperla  | (B)                         | Dactylopius tomentosus               |
|      | (C) Zygogramma bicolora  | <i>ta</i> (D)               | Bacillus thuringiensis               |
| 167. | Application of organic mater leads to:                             | ial with wider C:N ratio    | o (usually more than (20:1) to soil  |
|      | (A) N immobilization   | (B)                         | N leaching                           |
|      | (C) Immediate release in N   | N (D)                       | N mineralization                     |
| 168. | Heavy shedding of buds and   | bolls in cotton occurs d    | lue to:                              |
|      | (A) Deficiency of N in soil  | l (B)                       | Water stress at bud formation stage  |
|      | (C) Deficiency of P in soil  | (D)                         | Excess of N is soil                  |
| 169. | 'Whip tail' is brassica is due                                     | to the deficiency of:       |                                      |
|      | (A) Calcium  | (B)                         | Magnesium                            |
|      | (C) Manganese  | (D)                         | Zinc                                 |
| 170  | Which kind of soil mineralog                                       | w has the highest 'cati     | on exchange canacity':               |
| 1,01 | (A) Kaolinite  | (B)                         | Illite                               |
|      | (C) Montmorillonite  | (D)                         | Humus                                |
| 171  | Optimum row spacing for for  | dder crops is:              |                                      |
| 1/1. | $(\Delta)$ 30 cm   | (B)                         | 60 cm                                |
|      | (C) $45 \text{ cm}$  | (D)                         | 75 cm                                |
| 172  | The balance sheet of a dairy                                       | form ronrogant:             |                                      |
| 1/2. | $(\Lambda)$ A sets   | (B)                         | Liphilities                          |
|      | $(\mathbf{C})$ Both $(\mathbf{A})$ and $(\mathbf{B})$              | (D)                         | None of these                        |
| 172  | Main lineitation in lasening for                                   |                             | Tione of these                       |
| 1/3. | (A) Illitoraay   | rm records in India is:     | Noture of forming                    |
|      | (A) Initelacy<br>(C) $\operatorname{Pig}_{\text{size}}$ of holding | (D)                         | None of these                        |
|      | (C) Big size of holding  | (D)                         | None of these                        |
| 174. | Profit and loss account is a ty                                    | /pe of:                     |                                      |
|      | (A) Personal account   | (B)                         | Real account                         |
|      | (C) Nominal account  | (D)                         | None of these                        |
| 175. | Which is the most prominent  | book for keeping farm       | records and accounts:                |
|      | (A) Journal  | (B)                         | Ledger                               |
|      | (C) Cash book  | (D)                         | Purchase register                    |
| 176. | The list of all the physical proposed point of time is known as:   | operty of a business alo    | ng with their values at a specific   |
|      | (A) Assets   | (B)                         | Liabilities                          |
|      | (C) Farm inventory   | (D)                         | None of these                        |
| 177. | The decline in value of assets known as:                           | s due to usage, accident    | al damage and time obsolescence is   |
|      | (A) Appreciation   | (B)                         | Depreciation                         |
|      | (C) Interest   | (D)                         | None of these                        |
|      |  |                             |                                      |

| 178. | Which of the following is not a component of farm business:<br>(A) Capital (B) Land  |                     |  |
|------|--|---------------------|--|
|      | (C) Market   | (D)                 | Labour and management                                    |
| 179. | Queen of Fruits is:<br>(A) Mango<br>(C) Litchi   | (B)<br>(D)          | Apple<br>Banana  |
| 180. | <ul><li>Low chilling pears are trained by:</li><li>(A) Espaliar system</li><li>(C) Modified leader system</li></ul>        | (B)<br>(D)          | Centre leader system<br>Y trellies system                |
| 181. | <ul><li>Wind break established in the orchards is of:</li><li>(A) Jamun</li><li>(C) Karonda</li></ul>                      | (B)<br>(D)          | Jhatti Khatti<br>Galgal                                  |
| 182. | <ul><li>Strawberry is propagated through:</li><li>(A) Stolon</li><li>(C) Crown</li></ul>                                   | (B)<br>(D)          | Runners<br>Suckers                                       |
| 183. | <ul><li>Epicotyl grafting is commonly done in:</li><li>(A) Guava</li><li>(C) Pear</li></ul>                                | (B)<br>(D)          | Litchi<br>Mango  |
| 184. | Daisy is cross between:(A)Fortune x Fremont mandarin(C) <u>Citrus grandis</u> Osbeck <u>Paradisi</u> Macf.                 | (B)<br>(D)          | King x Willow leaf<br>Sweet orange x <i>C trifoliata</i> |
| 185. | <ul><li>Arunika is cross between:</li><li>(A) Dashehari x Neelum</li><li>(C) Amrapali x Vanraj</li></ul>                   | (B)<br>(D)          | Neelum x Dashehari<br>Sensation x Amrapali               |
| 186. | <ul><li><i>Phytophthora</i> is controlled with the application of</li><li>(A) Ridomil</li><li>(C) c. M 45</li></ul>        | (B)<br>(D)          | Bayleton<br>All of these                                 |
| 187. | <ul><li>Yellow pigment in papaya fruit is:</li><li>(A) Xanthophyll</li><li>(C) Lycopene</li></ul>                          | (B)<br>(D)          | Carotene<br>Caricaxanthin                                |
| 188. | <ul><li>Which garden is also referred as 'Nature in Minia</li><li>(A) Japanese</li><li>(C) English</li></ul>               | ture:<br>(B)<br>(D) | Mughals<br>Persian                                       |
| 189. | <ul> <li>Tree with drooping inflorescence is:</li> <li>(A) Jacaranda mimosaefolia</li> <li>(C) Bassia latifolia</li> </ul> | (B)<br>(D)          | Salyx baylonica<br>Kigelia pinnata                       |
| 190. | <ul><li>Red scarlet is a cultivar of:</li><li>(A) Radish</li><li>(C) Onion</li></ul>                                       | (B)<br>(D)          | Carrot<br>Turnip   |

| 191. | Whick<br>(A)   | h of the following is a climacteric fruit?<br>Muskmelon          | (B)            | Tomato  |
|------|--|--|----------------|---|
|      | (C)  | Both A and B   | (D)            | None of these   |
| 192. | Sun s<br>(A)<br>(C)  | calding incidence usually occurs in:<br>Brinjal<br>Muskmelon     | (B)<br>(D)     | Tomato<br>Cauliflower   |
| 193. | Sex e<br>(A)   | xpression in pointed gourd is:<br>Monoecious                     | (B)            | Andromonoecious   |
|      | (C)  | Dioecious  | (D)            | Hermaphrodite   |
| 194. | Whick<br>(A)   | h of the following soil is most suitable for veg<br>Sandy        | getable<br>(B) | es?<br>Sandy Loam   |
|      | (C)  | Clay loam  | (d)            | Clay  |
| 195. | The s (A)  | eed required for one hectare sowing of carrot<br>1-2 kg          | is<br>(B)      | 10-15 kg  |
|      | (C)  | 4-5 kg   | (D)            | 15-20 kg  |
| 196. | The main reason for blanching of fruits and vegetables is: |  |                |   |
|      | (A)<br>(C)   | To make them soft<br>To make the products taste better           | (B)<br>(D)     | To inactivate enzymes<br>For long term preservation of products     |
| 197. | What   | is Canning   |                |   |
|      | (A)  | Placing of foods in sealed metal containers                      | (B)            | Storage of foods in hermetically sealed containers                  |
|      | (C)  | Placing cans in retorts  | (D)            | None of these   |
| 198. | What   | is Brine   |                |   |
|      | (A)<br>(C)   | A solution of sugar and water<br>A solution of vinegar and water | (B)<br>(D)     | A solution of salt and water<br>An additive used in food processing |
| 199. | The n  | nost economical way of drying fruits and veg                     | etables        | s is  |
|      | (A)<br>(C)   | Solar drying<br>Mechanical drying                                | (B)<br>(D)     | Oven drying<br>None of these  |
| 200. | Prese  | rvative used in tomato Ketchup is                                |                |   |
|      | (A)<br>(C)   | Potassium Metabisulphite<br>Citric acid                          | (B)<br>(D)     | Sodium Benzoate<br>None of these                                    |

| Sr. | Question |
|-----|----------|
| No. |          |

Among the following, the most stable complex is 1. (B)  $[Fe (NH_3)_6]^{3+}$ (D)  $[Fe (Cl)_6]^{3-}$  $[Fe (H_2O)_6]^{34}$ (A)  $[Fe (C_2O_4)_3]^{3-1}$ (C) 2. Which is the correct coordination number (C.N) and oxidation number (O.N) of the transition metal atom in  $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ? (A) C.N=3, O.N=+1 (B) C.N=4, O.N=+2C.N=6, O.N=+1 (D) C.N=6, O.N=+3(C) 3. In a solid, oxide ions are arranged in ccp, cations A occupy one sixth of the tetrahedral voids and cation B occupy one third of the octahedral voids. The formula of the solid is: (A) ABO<sub>3</sub> (B) A<sub>3</sub>BO AB<sub>3</sub>O (C) (D)  $A_3B_3O_3$ 4. On mixing acetone to methanol some of the hydrogen bonds between methanol molecules break. Which of the following statements is correct about the above process? At specific composition methanol acetone At specific composition methanol (A) **(B)** mixture will form minimum boiling acetone mixture will form maximum azeotrope and show positive deviation boiling azeotrope and show positive deviation from Raoult's law from Raoult's law (C) At specific composition methanole (D) At specific composition methanole acetone mixture will form minimum acetone mixture will form maximum boiling azeotrope and show negative boiling azeotrope and show negative deviation from Raoult's law deviation from Raoult's law 5.  $K_{\rm H}$  value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10<sup>-5</sup> and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is: formaldehyde< carbon dioxide (A) formaldehyde<methane<carbon (B) dioxide<argon <methane<argon argon<carbon dioxide< argon <methane <carbon dioxide (C) (D) methane<formaldehyde < formaldehyde The number of faradays of electricity required for electrolytic conversion of the mole of 6. nitrobenzene to aniline is: (A) 3F (B) 4F 6F 5F (C) (D) 7. The positive value of the standard electrode potential of  $Ag^+/Ag$  indicates that: (A) This redox couple is a stronger reducing (B) This redox couple is a stronger agent than  $H^+/H_2$  couple oxidizing agent than  $H^+/H_2$  couple (D) Ag can displace  $H_2$  from base Ag can displace H<sub>2</sub> from acid (C) 8. Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The decrease in reaction rate is due to: A decrease in  $\triangle$  H for the reaction A decrease in surface area (A) **(B)** A decrease in the fraction of particles The introduction of an alternative (C) (D) pathway with greater activation possessing sufficient energy energy.

| 9.  | Which of the following statements is not correct?  |  |
|-----|--|--|
|     | (A) The rate of a reaction decreases with passage of time as concentration of  | (B) The instantaneous rate a reaction is same at any time during the reaction  |
|     | <ul> <li>(C) For a zero order reaction the concentration of reactants remains changed with passage of time</li> </ul>  | (D) The rate of a reaction decreases with increase in concentration of reactant (s)  |
| 10. | Which of the following gases shows the lowest ad   | sorption per gram of charcoal? The critical  |
|     | (A) $H_2$ (33K)<br>(C) $SO_2$ (630K)   | (B) $CH_4(190K)$<br>(D) $CO_2(304K)$   |
| 11. | <ul> <li>Freundlich adsorption isotherm is given by the exp statements are false?</li> <li>i. When 1/n=0, the adsorption is indeper</li> <li>ii. When n=0, the plot of x/m vs p graph</li> <li>iii. When 1/n=0, the adsorption is directly</li> <li>iv. When n=0, plot of x/m vs p is a curve</li> </ul>   | pression $x/m=kp^{1/n}$ . Which of the following<br>ndent of pressure.<br>is a line parallel to x axis.<br>y proportional to pressure. |
|     | (A) i and ii   | (B) ii and iv  |
| 12. | In the extraction of chlorine by electrolysis of an a<br>the following statements are true?<br>i. $\triangle G^0$ for the overall reaction is positiviti.<br>ii. $\triangle G^0$ for the overall reaction is negative<br>iii. $E^0$ for the overall reaction is positive<br>iv. $E^0$ for the overall reaction is negative<br>(A) i and iv<br>(C) ii and iii | aqueous solution of sodium chloride, which of<br>ve<br>ive<br>(B) i and iii<br>(D) iii and iv  |
| 13. | Which of the following pairs of ions are isoelectro<br>(A) $NO_2^+$ and $NO_3^-$<br>(C) $XeO_3^{-2-}$ and $PCl_3$  | (B) $ClO_3^-$ and $ICl_4^-$<br>(D) $ClO_3^-$ and $SO_3^{2-}$   |
| 14. | <ul> <li>Which of the following hydrides is the strongest re</li> <li>(A) NH<sub>3</sub></li> <li>(C) AsH<sub>3</sub></li> </ul>   | educing agent?<br>(B) PH <sub>3</sub><br>(D) SbH <sub>3</sub>  |
| 15. | Consider the reactions,<br>i. $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (N)$<br>ii. $Zn + dil. HNO_3 (cold) \longrightarrow Zn (N)$<br>Compounds X and Y are, respectively<br>(A) $N_2O$ , NO<br>(C) $N_2$ , $N_2O$   | $(NO_3)_2 + X + H_2O$<br>$NO_3)_2 + Y + H_2O$<br>$(B) NO_2, NO_2$<br>$(D) NO_2, NO$  |
| 16. | When KMnO <sub>4</sub> acts as an oxidizing agent in weakly manganese decreases by:<br>(A) 1   | y alkaline medium, the oxidation number of<br>(B) 2  |
|     |  |  |

| 17. | Acidified potassium dichromate solution turns green when Na <sub>2</sub> SO <sub>3</sub> is added to it due to the formation of: |  |                       |  |  |  |
|-----|--|--|-----------------------|--|--|--|
|     | (A)<br>(C)   | CrSO <sub>4</sub><br>CrO <sub>4</sub> <sup>2-</sup>  | (B)<br>(D)            | $Cr_2(SO_4)_3$<br>$Cr_2(SO_3)_3$   |  |  |
| 18. | The de<br>Which<br>number<br>(A)   | The d-electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ and $Co^{2+}$ are $d^4$ , $d^5$ , $d^6$ and $d^7$ , respectively.<br>Which one of the following complexes will exhibit minimum paramagnetic behavior? (atomic numbers of $Cr=24$ , $Mn=25$ , $Fe=26$ , $Co=27$ )<br>(A) = [Cr(H-O)]^{2+} (B) = [Mn(H-O)]^{2+} |                       |  |  |  |
|     | (C)  | $[Fe(H_2O)_6]^{2+}$  | (D)                   | $[Co(H_2O)_6]^{2+}$  |  |  |
| 19. | When is:   | 2-Bromopentane is heated with potassium et   | hoxide                | e in ethanol, the major product obtained   |  |  |
|     | (A)<br>(C)   | 2-Ethoxypentane<br>Cis-Pent-2-ene  | (B)<br>(D)            | Pent-1-ene<br>Trans-Pent-2-ene   |  |  |
| 20. | Which<br>(A)<br>(C)  | n of the following undergoes nucleophilic sub<br>Chloroethane<br>Chlorobenzene   | (B)<br>(D)            | on exclusively by S <sub>N</sub> <sup>1</sup> mechnism?<br>Isopropyl chloride<br>Benzyl chloride         |  |  |
| 21. | The n<br>(A)<br>(C)  | umber of possible stereoisomers for CH <sub>3</sub> CH=<br>8<br>4  | CHCH<br>(B)<br>(D)    | H <sub>2</sub> CH(Br)CH <sub>3</sub> is:<br>2<br>6   |  |  |
| 22. | 2-Met<br>(A)<br>(C)  | hoxy-2-methylpropane on heating with HI pr<br>Methanol and sec-propyl iodide<br>Methyl iodide and isobutene  | oduce<br>(B)<br>(D)   | s:<br>Methyl iodide and tert-butyl alcohol<br>Methanol and tet-butyl iodide                              |  |  |
| 23. | The le<br>(A)<br>(C)   | east acidic compound among the following is:<br>o-Nitrophenol<br>p-Nitrophenol   | (B)<br>(D)            | m-Nitrophenol<br>Phenol  |  |  |
| 24. | An all<br>The k  | kene $C_7H_{14}$ on reductive ozonolysis gives an a etone is:  | aldehy                | de with formula $C_3H_6O$ and a ketone.  |  |  |
|     | (A)<br>(C)   | 2-Butanone<br>3-Pentanone  | (B)<br>(D)            | 2-Pentanone<br>Propanone   |  |  |
| 25. | The in<br>Aceto  | ncreasing order of the rate of addition of HCN<br>ne iii) Acetophenone iv) benzophenone  | to the                | e compounds i) Formaldehyde ii)  |  |  |
|     | (A)<br>(C)   | i <ii <="" iii<="" iv<br="">iv<iii< i<="" ii<="" td=""><td>(B)<br/>(D)</td><td>iv&lt; ii&lt; iii &lt; i<br/>iv&lt; i&lt; ii&lt; iii</td></iii<></ii>   | (B)<br>(D)            | iv< ii< iii < i<br>iv< i< ii< iii  |  |  |
| 26. | The ca<br>(A)<br>(C)   | arboxylic acid that does not undergo Hell-Vo<br>CH <sub>3</sub> COOH<br>CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH   | hlard-Z<br>(B)<br>(D) | Zelinsky reaction is:<br>(CH <sub>3</sub> ) <sub>2</sub> CHCOOH<br>(CH <sub>3</sub> ) <sub>3</sub> CCOOH |  |  |
| 27. | C <sub>2</sub> H <sub>5</sub> N  | $NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y \xrightarrow{NH_3} (excess)$   | Z                     |  |  |  |
|     | In the   | above sequence, Z is:  | $(\mathbf{D})$        | athonomida   |  |  |
|     | (A) $(C)$  | methanamine  | (D)                   | Ethanamine   |  |  |

| 28. | The attachment of which of the following group at para position in aniline will raise the K <sub>b</sub> value?   |  |  |  |  |
|-----|---|--|--|--|--|
|     | $ \begin{array}{ll} (A) & -SO_3H \\ (C) & -F \end{array} $  | (B) -OH<br>(D) -Br   |  |  |  |
| 29. | <ul><li>Which of the following is an example of globular</li><li>(A) myosin</li><li>(C) keratin</li></ul>   | protein?<br>(B) collagen<br>(D) haemoglobin  |  |  |  |
| 30. | <ul><li>Which one of the following is synthesized in our</li><li>(A) Vitamin D</li><li>(C) Vitamin K</li></ul>  | body by sun rays?<br>(B) Vitamin B<br>(D) Vitamin A  |  |  |  |
| 31. | Caprolactum is the is the starting material for the   | synthesis of   |  |  |  |
|     | <ul><li>(A) Nylon-6</li><li>(C) Terylene</li></ul>  | <ul><li>(B) Nylon6,6</li><li>(D) Nylon 10</li></ul>  |  |  |  |
| 32. | <ul><li>The species which can serve as an initiator for cat</li><li>(A) Lithium aluminium hydride</li><li>(C) Aluminium chloride</li></ul>                                      | ionic polymerization is<br>(B) Nitric acid<br>(D) BuLi   |  |  |  |
| 33. | Aspirin is an:<br>(A) analgesic<br>(C) antimalarial   | <ul><li>(B) antipyretic</li><li>(D) Both analgesic and antipyretic</li></ul>                               |  |  |  |
| 34. | <ul> <li>The equivalent mass of iron in the reaction 2Fe +</li> <li>(A) Half of its atomic mass</li> <li>(C) Same as atomic mass</li> </ul>                                     | $3Cl_2 \rightarrow 2FeCl_3$ is:<br>(B) One third of its atomic mass<br>(D) One fourth of its atomic mass   |  |  |  |
| 35. | Which of the following sets of quantum numbers<br>(A) $n=4$ , $l=3$ , $m=4$ , $s=+1/2$<br>(C) $n=4$ , $l=3$ , $m=+1$ , $s=+1/2$   | is correct for an electron in 4f subshell?<br>(B) $n=4, l=3, m=-4, s=-1/2$<br>(D) $n=3, l=2, m=-2, s=+1/2$ |  |  |  |
| 36. | The correct sequence of atomic radii is:<br>(A) Na>Mg>Al>Si<br>(C) Si>Al>Mg>Na  | <ul><li>(B) Al&gt;Si&gt;Na&gt;Mg</li><li>(D) Si&gt;Al&gt;Na&gt;Mg</li></ul>                                |  |  |  |
| 37. | In which of the following, the bond angle around (A) $NH_3$<br>(C) $PCl_3$  | the central atom is maximum?<br>(B) $NH_4^+$<br>(D) $SCl_2$  |  |  |  |
| 38. |   | (B) $NF_5$<br>(D) $N_2H_4$   |  |  |  |
| 39. | <ul><li>If helium is allowed to expand in vacuum, it liber</li><li>(A) It is an inert gas</li><li>(C) Its critical temp. is low</li></ul>                                       | <ul><li>ates heat because</li><li>(B) It is an ideal gas</li><li>(D) It is a light gas</li></ul>           |  |  |  |
| 40. | i) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ ii) $H_2(g) \rightarrow H_2O(I) + x KJ$ iii) $H_2(g) \rightarrow H_2O(I) + x KJ$<br>reactions,<br>(A) $x > y$<br>(C) $x = y$ | + $1/2O_2(g) \rightarrow H_2O(g) + y$ KJ; For the given two<br>(B) $x < y$<br>(D) $x + y = 0$              |  |  |  |

| 41. | If the l<br>respec<br>(A)<br>(C)   | bond dissociation energies of XY, $X_2$ , $Y_2$ (all<br>tively and $\Delta_f H$ of XY is -200KJmol <sup>-1</sup> , the bor<br>400 KJmol <sup>-1</sup><br>200 KJmol <sup>-1</sup> | diaton<br>nd diss<br>(B)<br>(D) | nic molecules) are in the ratio 1:1:0.5,<br>sociation energy of $X_2$ will be:<br>300 KJmol <sup>-1</sup><br>100 KJmol <sup>-1</sup> |  |
|-----|--|--|---------------------------------|--|--|
| 42. | What will be the correct order of vapour pressure of water, ethanol and ether at 30 <sup>o</sup> C? Given th among these compounds water has maximum boiling point and ether has minimum boiling point |  |                                 |  |  |
|     | (A)  | Water <ether<ethanol< td=""><td>(B)</td><td>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<>   | (B)                             | Water <ethanol<ether< td=""></ethanol<ether<>  |  |
|     | (C)  | Ether <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>   | (D)                             | Ethanol <ether<water< td=""></ether<water<>  |  |
| 43. | Which<br>consta<br>(A)   | of the following will occur if a 0.1M solution<br>t temperature?<br>$[H^+]$ will decrease to 0.001M  | n of a<br>(B)                   | weak acid is diluted to 0.01M at<br>pH will decrease   |  |
|     | (C)  | Percentage ionization will increase  | (D)                             | K <sub>a</sub> will increase   |  |
| 44. | Which  | of the following species involves the transfe  | r of 5]                         | N <sub>A</sub> electrons per mole of it ?  |  |
|     | (A)  | $MnO_4^2 \rightarrow MnO_4^-$  | (B)                             | $MnO_4^- \rightarrow Mn^{2+}$  |  |
| 45. | (C)<br>30-vol  | ume hyderogen peroxide means:  | (D)                             | $ClO_4 \rightarrow Cl$   |  |
|     | (A)  | $30\% H_2O_2$ by volume  | (B)                             | $30g$ of $H_2O_2$ solution containing 1g of it   |  |
|     | (C)  | 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ gas at STP   | (D)                             | $30 \text{ cm}^3$ of the solution contains one mole of $H_2O_2$  |  |
| 46. | The co   | prrect sequence of covalent character is repres  | sented                          | by:  |  |
|     | (A)<br>(C)   | LiCl <nacl<becl<sub>2<br/>NaCl<licl< becl<sub="">2</licl<></nacl<becl<sub>   | (B)<br>(D)                      | BeCl <sub>2</sub> <licl<nacl<br>BeCl<sub>2</sub><nacl<licl< td=""></nacl<licl<></licl<nacl<br>                                       |  |
| 47. | Which  | of the following is known as pyrene?   |                                 |  |  |
|     | (A)<br>(C)   | $CCl_4$<br>S <sub>2</sub> Cl <sub>2</sub>  | (B)<br>(D)                      | CS <sub>2</sub><br>Solid CO <sub>2</sub>   |  |
| 48. | The m  | ost stable carbocation amongst the following   | is:                             | N. C <sup>+</sup>  |  |
|     | (A)<br>(C)   | $(CH_3)_2CH^2$<br>$CH_2CH_2^+$   | (B)                             | $Ph_3C^+$<br>$CH_2 = CH_2CH_2^+$   |  |
| 10  | (C)<br>The m   | olecule that will have dipole moment is:   | (D)                             |  |  |
| 49. | (A)<br>(C)   | 2,2-Dimethylpropane<br>Trans-2-Butene  | (B)<br>(D)                      | Cis-2-Butene<br>2,2,3,3-Tetramethylbutane  |  |
| 50. | Of the<br>(A)<br>(C)   | five isomeric hexanes, the isomer which can<br>2-Methylpentane<br>2,3-Dimethylbutane   | give (B)<br>(D)                 | wo monochlorinated compound is:<br>2,2-Dimethylbutane<br>n-Hexane  |  |
| 51. | Cross<br>(A)<br>(C)  | ing over occurs in meiosis I during:<br>Metaphase<br>Anaphahse   | (B)<br>(D)                      | Telophase<br>Pachytene   |  |
| 52  | Dowe   | r house of the call:   |                                 |  |  |
| 32. | rowei<br>(A)   | Golgi body   | (B)                             | Ribosomes  |  |
|     | (C)  | Mitochondria   | (D)                             | Lysosomes  |  |
|     |  |  |                                 |  |  |

| 53. | Gene           | tics is the study of:                                       |         |  |
|-----|----------------|---|---------|--|
|     | (A)            | Heredity  | (B)     | Variation                              |
|     | (C)            | Both A and B  | (D)     | None of these                          |
| 54. | In sex         | k -linked inheritance, characters are passe                 | d fron  | n father to the grandsons through his: |
|     | (A)            | Daughter  | (B)     | Son                                    |
|     | (C)            | Both daughter and son                                       | (D)     | Any of them                            |
| 55. | Whic           | h of the following bases is not present in                  | RNA:    |  |
|     | (A)            | Uracil  | (B)     | Thymine                                |
|     | (C)            | Adenine   | (D)     | Cytosine                               |
| 56. | Mend           | lel's principle of independent assortment of                | can be  | demonstrated through:                  |
|     | (A)            | Monohybrid cross  | (B)     | Dihybrid cross                         |
|     | (C)            | Both A and B  | (D)     | Any of them                            |
| 57. | On hy          | ydrolysis, maltose gives                                    |         |  |
|     | (A)            | glucose + glucose   | (B)     | glucose + lactose                      |
|     | (C)            | glucose + fructose  | (D)     | glucose + galactose                    |
| 58. | A dip          | eptide has peptide bonds.                                   |         |  |
|     | (A)            | Three   | (B)     | One                                    |
|     | (C)            | Two   | (D)     | None of them                           |
| 59. | Whic<br>but ne | h vitamin can be synthesized by green pla<br>ot by mammals? | ants ar | nd various micro-oraganisms            |
|     | (A)            | Ascorbic acid   | (B)     | Pantothenic acid                       |
|     | (C)            | Thiamine  | (D)     | Retinol                                |
| 60. | Bacte          | rial cell wall is made up of:                               |         |  |
|     | (A)            | Chitin  | (B)     | Cellulose                              |
|     | (C)            | Peptidoglycan   | (D)     | All the above                          |
| 61. | Plant          | viruses are generally of:                                   |         |  |
|     | (A)            | RNA   | (B)     | DNA                                    |
|     | (C)            | mRNA  | (D)     | tRNA                                   |
| 62. | Gram           | positive aerobic, filamentous bacteria wi                   | th hyp  | bhae are known as:                     |
|     | (A)            | Algae   | (B)     | Actinomycetes                          |
|     | (C)            | Bacteria  | (D)     | Fungi                                  |
| 63. | Conv           | ersion of organic matter in to simple inor                  | ganic   | forms is called:                       |
|     | (A)            | Immobilization  | (B)     | Mineralization                         |
|     | (C)            | Co <sub>2</sub> fixation                                    | (D)     | Nitrification                          |

| 64. | Exces              | s carbon (> C/N ratio) leads to rate of dec | C/N ratio) leads to rate of decomposition: |              |  |  |  |
|-----|--------------------|---|--|--------------|--|--|--|
|     | (A)                | Slow  | (B)  | Fast         |  |  |  |
|     | (C)                | Optimum                                     | (D)  | None         |  |  |  |
| 65. | N <sub>2</sub> fix | ing cells of cyanobacteria are known as:    |  |              |  |  |  |
|     | (A)                | Cyst  | (B)  | Akinetes     |  |  |  |
|     | (C)                | Spores                                      | (D)  | Heterocyst   |  |  |  |
| 66. | Livest             | ock is important source of:                 |  |              |  |  |  |
|     | (A)                | Milk  | (B)  | Meat         |  |  |  |
|     | (C)                | Manure                                      | (D)  | All of these |  |  |  |
| 67. | Dairy              | cattle and buffalo can be called as:        |  |              |  |  |  |
|     | (A)                | Caprine                                     | (B)  | Ovine        |  |  |  |
|     | (C)                | Bovine                                      | (D)  | Equine       |  |  |  |
| 68. | Best b             | reed of buffalo in India:                   |  |              |  |  |  |
|     | (A)                | Nili Ravi                                   | (B)  | Murrah       |  |  |  |
|     | (C)                | Surti                                       | (D)  | Toda         |  |  |  |
| 69. | Best la            | ayer poultry strain is:                     |  |              |  |  |  |
|     | (A)                | WLH   | (B)  | Minorca      |  |  |  |
|     | (C)                | Karaknath                                   | (D)  | Sutlez       |  |  |  |
| 70. | Norma              | al birth weight (Kg) of healthy buffalo ca  | alf is:                                    |              |  |  |  |
|     | (A)                | 20  | (B)  | 30           |  |  |  |
|     | (C)                | 40  | (D)  | 50           |  |  |  |
| 71. | Numb               | er of teats in buffalo:                     |  |              |  |  |  |
|     | (A)                | 2   | (B)  | 4            |  |  |  |
|     | (C)                | 6   | (D)  | 8            |  |  |  |
| 72. | Dry m              | atter requirement (kg) of a cow weighing    | g 400                                      | kg is:       |  |  |  |
|     | (A)                | 8   | (B)  | 10           |  |  |  |
|     | (C)                | 12  | (D)  | 14           |  |  |  |
| 73. | Green              | fodder requirement of adult cattle (kg):    |  |              |  |  |  |
|     | (A)                | 30  | (B)  | 40           |  |  |  |
|     | (C)                | 50  | (D)  | 60           |  |  |  |
| 74. | Which              | n of the following crops is the best for ha | y mak                                      | ing:         |  |  |  |
|     | (A)                | Jowar                                       | (B)  | Bajra        |  |  |  |
|     |                    | D   | $(\mathbf{D})$                             | 0-4          |  |  |  |

| 75. | Norm                | al body temperature of healthy poultry bi  | ird (°F          | ):   |
|-----|---------------------|--|------------------|--|
|     | (A)                 | 37.0   | (B)              | 98.6   |
|     | (C)                 | 107.0  | (D)              | 117.0  |
| 76. | ICAR                | -National Dairy Research Institute (NDR  | (B)              | ocated at:   |
|     | (A)                 | Karnal   | (B)              | New Delhi  |
|     | (C)                 | Bareilly   | (D)              | Anand  |
| 77. | Exces<br>(A)<br>(C) | ssive gas accumulation in rumen indicates<br>Impaction<br>Milk fever                 | s:<br>(B)<br>(D) | Bloat<br>Foot and Mouth Disease                      |
| 78. | Most<br>(A)<br>(C)  | fatal disease in farm animals is:<br>Foot and Mouth Disease<br>Rinderpest            | (B)<br>(D)       | HS<br>Anthrax  |
| 79. | Seme<br>(A)<br>(C)  | n is stored in liquid nitrogen at (°C):<br>-79<br>79                                 | (B)<br>(D)       | -196<br>196  |
| 80. | Durin               | g Artificial Insemination (AI) semen sho   | uld be           | deposited  |
|     | (A)                 | Vagina   | (B)              | Cervix   |
|     | (C)                 | Uterus   | (D)              | Fallopian tube                                       |
| 81. | Seeds<br>(A)<br>(C) | of groundnut contain about:<br>25% oil and 50% protein<br>40% oil and 40% protein    | (B)<br>(D)       | 20% oil and 40% protein<br>50% oil and 25% protein   |
| 82. | Orgar<br>(A)<br>(C) | nic carbon is a measure of<br>Available nitrogen in soil<br>Excess of carbon in soil | (B)<br>(D)       | Available nutrient in soil<br>Excess of iron in soil |
| 83. | Whick               | h among the following element is conside   | ered in          | nmobile in the plant                                 |
|     | (A)                 | Calcium  | (B)              | Phosphorus   |
|     | (C)                 | Nitrogen   | (D)              | Magnesium  |
| 84. | Whick               | h among the following is recommended v   | variety          | of durum wheat:                                      |
|     | (A)                 | HD 2960  | (B)              | WH 896   |
|     | (C)                 | PBW 725  | (D)              | WH 711   |
| 85. | Recor               | nmended dose of nutrients for berseem (1   | kg/acro          | e) is:   |
|     | (A)                 | 10 kg N, 28 kg P <sub>2</sub> O <sub>5</sub>   | (B)              | 40 kg N, 25 kg P <sub>2</sub> O <sub>5</sub>         |
|     | (C)                 | 20 kg N, 40 kg P <sub>2</sub> O <sub>5</sub>   | (D)              | 20 kg N, 20 kg P <sub>2</sub> O <sub>5</sub>         |
| 86. | Optin<br>(A)<br>(C) | num row spacing for cotton is:<br>50 cm<br>67.5 cm                                   | (B)<br>(D)       | 60 cm<br>75 cm                                       |

| 87. | Optimum sowing time of summer moong in the state is: |   |                |                                |  |
|-----|--|---|----------------|--------------------------------|--|
|     | (Å)  | March                                       | (B)            | Second fortnight of February   |  |
|     | (C)  | First fortnight of April                    | (D)            | End June-early July            |  |
| 88. | 'Whit  | e alkali' soil refers to:                   |                |                                |  |
|     | (A)  | Acid soil                                   | (B)            | Saline soil                    |  |
|     | (C)  | Salina sodic soil                           | (D)            | Sodic soil                     |  |
| 80  | <b>T</b> 1   |   | 1              | 1 • 1                          |  |
| 89. | I he e $(\Lambda)$                                   | xchange sodium percentage (ESP) of alka     | $(\mathbf{D})$ | Is is always:                  |  |
|     | (A)  | Nore than 15                                | $(\mathbf{B})$ | Any value                      |  |
|     | (C)  | Less than 15                                | (D)            | Less than 7.5                  |  |
| 90. | ICAR   | -Central Arid Zone Research Institute is    | locate         | ed at:                         |  |
|     | (A)  | Nagpur                                      | (B)            | Hyderabad                      |  |
|     | (C)  | New Delhi                                   | (D)            | Jodhpur                        |  |
| 91. | India  | is divided in to ecological zones           |                |                                |  |
|     | (A)  | 12  | (B)            | 10                             |  |
|     | (C)  | 15  | (D)            | 20                             |  |
| 02  | D  |   | 1.             |                                |  |
| 92. | Kecol  | nmended seed rate (kg/na) of dhaincha of    | $(\mathbf{D})$ | 20                             |  |
|     | (A)  | 20  | $(\mathbf{B})$ | 50<br>50                       |  |
|     | (C)  | 40  | (D)            | 50                             |  |
| 93. | Reco   | nmended seed rate for spring season mun     | igbeai         | n is                           |  |
|     | (A)  | 15-20 kg per acre                           | (B)            | 25-30 kg per hectare           |  |
|     | (C)  | 15-20 kg per hectare                        | (D)            | 10 kg per hectare              |  |
| 94. | For tr   | ansplanting of pearl millet (bajra) in Hary | vana, o        | optimum age of seedlings is:   |  |
|     | (A)  | Two weeks                                   | (B)            | Three weeks                    |  |
|     | (C)  | Four weeks                                  | (D)            | Five weeks                     |  |
| 05  | Dlind  | tillaga rafara ta:                          |                |                                |  |
| 95. | $(\Lambda)$  | Summer ploughing                            | $(\mathbf{R})$ | Primary tillage                |  |
|     | $(\mathbf{A})$                                       | Hoeing before germination                   | $(\mathbf{D})$ | Hoeing in standing crop rows   |  |
|     | (C)  | Hoenig before germination                   | (D)            | The fing in standing crop rows |  |
| 96. | Flame  | e photometer is used for the determination  | n of:          |                                |  |
|     | (A)  | Nitrogen                                    | (B)            | Phosphorus                     |  |
|     | (C)  | Potassium                                   | (D)            | Boron                          |  |
| 97. | Tetra  | zolium test is conducted to test the:       |                |                                |  |
|     | (A)  | Physical purity of seed                     | (B)            | Percentage of weed seeds       |  |
|     | (C)  | Viability of seed                           | (D)            | Seed germination               |  |
| 98. | World  | l Food Day is celebrated on:                |                |                                |  |
|     | (A)  | 5 June                                      | (B)            | 20 June                        |  |
|     | (C)  | 28 February                                 | )              | 16 October                     |  |

| 99. Which among the following is the best and cheapest method of w |                |   | method of weed control: |                                 |  |  |
|--|----------------|---|-------------------------|---------------------------------|--|--|
|  | (A)            | Cultural measures                                       | (B)                     | Herbicide based weed control    |  |  |
|  | (C)            | Biological control                                      | (D)                     | Preventive measures             |  |  |
| 100  | Black          | soils in India belong to soil order.                    |                         |                                 |  |  |
| 100.   | (A)            | Alfisol   | (B)                     | Incentisol                      |  |  |
|  | $(\Gamma)$     | Vertisol  | (D)                     | Oxisol                          |  |  |
|  | (C)            | Vertisor  | (D)                     | CAISOI                          |  |  |
| 101.   | Whic           | Which among the following crop has epigeal germination? |                         |                                 |  |  |
|  | (A)            | Sunflower   | (B)                     | Chickpea                        |  |  |
|  | (C)            | Rice  | (D)                     | Pearl millet                    |  |  |
| 102.   | Whic           | h fraction of soil organic matter is soluble            | e in bo                 | oth alkali and acid:            |  |  |
|  | (A)            | Humic acid  | (B)                     | Fulvic acid                     |  |  |
|  | (C)            | Hymatomelonic acid                                      | (D)                     | Humin acid                      |  |  |
| 103.   | Nitro          | gen use efficiency in rice can be increase              | d bv <sup>.</sup>       |                                 |  |  |
|  | (A)            | Delayed application of N                                | (B)                     | Use of biofertilizers           |  |  |
|  | (C)            | Application of S-coated urea                            | (D)                     | Application of blue green algae |  |  |
| 104  | Whield         |   |                         |                                 |  |  |
| 104.   | winc.          | Commination   | (D)                     | Eormativa staga                 |  |  |
|  | $(\mathbf{A})$ | Grand growth phase                                      | $(\mathbf{D})$          | Pinoning stage                  |  |  |
|  | (C)            | Grand growth phase                                      | (D)                     | Ripening stage                  |  |  |
| 105.   | The la         | argest producer of rapeseed-mustard in Ir               | idia is                 |                                 |  |  |
|  | (A)            | Haryana   | (B)                     | Uttar Pradesh                   |  |  |
|  | (C)            | Rajasthan   | (D)                     | Gujarat                         |  |  |
| 106.   | The te         | erm Functional or Metabolic Nutrients wa                | as pro                  | posed by:                       |  |  |
|  | (A)            | JV Leibig   | (B)                     | DJ Nicholas                     |  |  |
|  | (C)            | DI Arnon  | (D)                     | Mosanoba Fukuoka                |  |  |
| 107.   | Botan          | nical name of sunnhemp is                               |                         |                                 |  |  |
|  | (A)            | Sesbania aculeata                                       | (B)                     | Trifolium alexandrinum          |  |  |
|  | (C)            | Carthamus tinctorium                                    | (D)                     | Crotolaria juncea               |  |  |
| 108.   | The u          | pper limit of soil moisture available for p             | olant g                 | rowth is:                       |  |  |
|  | (A)            | PWP (15 bars)   | (B)                     | Hygroscopic coefficient         |  |  |
|  | (C)            | Field capacity (1/3 bars)                               | (D)                     | Gravitational potential         |  |  |
| 109.   | For w          | which fertilizer. India is fully dependent of           | n impo                  | ort?                            |  |  |
|  | (A)            | N fertilizers   | (B)                     | K fertilizers                   |  |  |
|  | (C)            | P fertilizers   | (D)                     | S fertilizers                   |  |  |
| 110  | A ~~~~         | to logy is the branch of A area area that 1             | aala                    | ith gultivation of              |  |  |
| 110.   | Agros          | A remetie and modified arous                            | eals W                  | Non adible ailseade             |  |  |
|  | (A)            | Fodder grops  | (D)                     | Groop manura grops              |  |  |
|  | $(\mathbf{U})$ | rouder crops  | (D)                     | Green manure crops              |  |  |

| 111. | With<br>(A)<br>(C)           | excessive use of nitrogen in sugarcane, th<br>Increased<br>Decreased  | e sug<br>(B)<br>(D)                              | ar content in juice is:<br>Remains same<br>Not affected                   |
|------|------------------------------|---|--|---|
| 112. | Bacte<br>(A)<br>(C)          | ria responsible for nitrogen fixation in sog<br><i>Rhizobium leguminosarum</i><br><i>Rhizobium phaseoli</i> | ybean<br>(B)<br>(D)                              | is<br>Rhizobium japonicum<br>Rhizobium trifoli                            |
| 113. | The n<br>(A)<br>(C)          | nost critical stage of irrigation in maize is:<br>Silking stage<br>Grain development stage                  | :<br>(B)<br>(D)                                  | Tasseling stage<br>Dough stage  |
| 114. | Nippi<br>(A)<br>(C)          | ng in chickpea is beneficial to:<br>Promote branching<br>Check excessive vegetative growth                  | (B)<br>(D)                                       | Promote flowering<br>Improve seed setting                                 |
| 115. | Quant<br>(A)<br>(C)          | tity of urea required by wheat for one acre<br>130<br>110   | e at a<br>(B)<br>(D)                             | dose of 125 kg per hectare is:<br>90<br>275                               |
| 116. | Congr<br>(A)<br>(C)          | ress grass (Parthenium hysterophorus) ca<br>Chrysoperla<br>Zygogramma bicolorata                            | n be c<br>(B)<br>(D)                             | controlled by insect:<br>Dactylopius tomentosus<br>Bacillus thuringiensis |
| 117. | Appli<br>leads<br>(A)<br>(C) | cation of organic material with wider C:N<br>to:<br>N immobilization<br>Immediate release in N              | (B)<br>(D)                                       | N leaching<br>N mineralization  |
| 118. | Heavy<br>(A)<br>(C)          | y shedding of buds and bolls in cotton occ<br>Deficiency of N in soil<br>Deficiency of P in soil            | curs d<br>(B)<br>(D)                             | ue to:<br>Water stress at bud formation stage<br>Excess of N is soil      |
| 119. | 'Whip<br>(A)<br>(C)          | p tail' is brassica is due to the deficiency of<br>Calcium<br>Manganese                                     | of:<br>(B)<br>(D)                                | Magnesium<br>Zinc   |
| 120. | Whick<br>(A)<br>(C)          | h kind of soil mineralogy has the highest<br>Kaolinite<br>Montmorillonite                                   | <ul><li>'catio</li><li>(B)</li><li>(D)</li></ul> | on exchange capacity':<br>Illite<br>Humus                                 |
| 121. | Optin<br>(A)<br>(C)          | num row spacing for fodder crops is:<br>30 cm<br>45 cm  | (B)<br>(D)                                       | 60 cm<br>75 cm  |
| 122. | The b<br>(A)<br>(C)          | alance sheet of a dairy farm represent:<br>Assets<br>Both (A) and (B)                                       | (B)<br>(D)                                       | Liabilities<br>None of these  |
| 123. | Main<br>(A)<br>(C)           | limitation in keeping farm records in Indi<br>Illiteracy<br>Big size of holding                             | a is:<br>(B)<br>(D)                              | Nature of farming<br>None of these  |
|      |                              |   |  |   |

| 124. | Profit and loss account is a type of:                                   |                |                                     |  |  |
|------|---|----------------|-------------------------------------|--|--|
|      | (A) Personal account  | (B)            | Real account                        |  |  |
|      | (C) Nominal account   | (D)            | None of these                       |  |  |
| 125. | Which is the most prominent book for keeping farm records and accounts: |                |                                     |  |  |
|      | (A) Journal   | (B)            | Ledger                              |  |  |
|      | (C) Cash book   | (D)            | Purchase register                   |  |  |
| 126. | The list of all the physical property of a busine                       | ess alo        | ong with their values at a specific |  |  |
|      | point of time is known as:  |                |                                     |  |  |
|      | (A) Assets  | (B)            | Liabilities                         |  |  |
|      | (C) Farm inventory  | (D)            | None of these                       |  |  |
| 127. | The decline in value of assets due to usage, ac                         | cident         | al damage and time obsolescence is  |  |  |
|      | known as:   |                | C                                   |  |  |
|      | (A) Appreciation  | (B)            | Depreciation                        |  |  |
|      | (C) Interest  | (D)            | None of these                       |  |  |
| 128. | Which of the following is not a component of                            | farm 1         | business:                           |  |  |
|      | (A) Capital   | (B)            | Land                                |  |  |
|      | (C) Market  | (D)            | Labour and management               |  |  |
| 120  | Queen of Eruita is:   |                |                                     |  |  |
| 129. | (A) Mango   | $(\mathbf{B})$ | Apple                               |  |  |
|      | (C) Litchi  | (D)            | Banana                              |  |  |
|      |   | (2)            |                                     |  |  |
| 130. | Low chilling pears are trained by:                                      | $(\mathbf{D})$ | Contro los don sustan               |  |  |
|      | (A) Espanar System<br>(C) Modified leader system                        | $(\mathbf{B})$ | V trellies system                   |  |  |
|      | (C) Woulded leader system   | (D)            | r tremes system                     |  |  |
| 131. | Wind break established in the orchards is of:                           |                |                                     |  |  |
|      | (A) Jamun   | (B)            | Jhatti Khatti                       |  |  |
|      | (C) Karonda   | (D)            | Galgal                              |  |  |
| 132. | Strawberry is propagated through:                                       |                |                                     |  |  |
|      | (A) Stolon  | (B)            | Runners                             |  |  |
|      | (C) Crown   | (D)            | Suckers                             |  |  |
| 133. | Epicotyl grafting is commonly done in:                                  |                |                                     |  |  |
|      | (A) Guava   | (B)            | Litchi                              |  |  |
|      | (C) Pear  | (D)            | Mango                               |  |  |
| 124  | Doigy is gross between  |                |                                     |  |  |
| 134. | (A) Fortune x Fremont mandarin  | (B)            | King x Willow leaf                  |  |  |
|      | (C) Citrus grandis Osbeck $\times$ Citrus                               | (D)            | Sweet orange x <i>C trifoliata</i>  |  |  |
|      | <u>Paradisi</u> Macf.   | (-)            | 6                                   |  |  |
| 135  | Arunika is cross between  |                |                                     |  |  |
| 100. | (A) Dashehari x Neelum  | (B)            | Neelum x Dashehari                  |  |  |
|      | C Amrapali x Vanraj   | (D)            | Sensation x Amrapali                |  |  |
|      | · · · · · · · · · · · · · · · · · · ·                                   | · · ·          | *                                   |  |  |

| 136. | Phytop<br>(A)<br>(C)        | <i>ohthora</i> is controlled with the application of:<br>Ridomil<br>c. M 45                              | (B)<br>(D)             | Bayleton<br>All of these   |
|------|-----------------------------|--|------------------------|--|
| 137. | Yellov<br>(A)<br>(C)        | v pigment in papaya fruit is:<br>Xanthophyll<br>Lycopene   | (B)<br>(D)             | Carotene<br>Caricaxanthin  |
| 138. | Which<br>(A)<br>(C)         | garden is also referred as 'Nature in Miniatu<br>Japanese<br>English                                     | ure:<br>(B)<br>(D)     | Mughals<br>Persian   |
| 139. | Tree w<br>(A)<br>(C)        | vith drooping inflorescence is:<br>Jacaranda mimosaefolia<br>Bassia latifolia                            | (B)<br>(D)             | Salyx baylonica<br>Kigelia pinnata   |
| 140. | Red so<br>(A)<br>(C)        | earlet is a cultivar of:<br>Radish<br>Onion  | (B)<br>(D)             | Carrot<br>Turnip   |
| 141. | Which<br>(A)<br>(C)         | of the following is a climacteric fruit?<br>Muskmelon<br>Both A and B                                    | (B)<br>(D)             | Tomato<br>None of these  |
| 142. | Sun sc<br>(A)<br>(C)        | alding incidence usually occurs in:<br>Brinjal<br>Muskmelon  | (B)<br>(D)             | Tomato<br>Cauliflower  |
| 143. | Sex ex<br>(A)<br>(C)        | pression in pointed gourd is:<br>Monoecious<br>Dioecious   | (B)<br>(D)             | Andromonoecious<br>Hermaphrodite   |
| 144. | Which<br>(A)<br>(C)         | of the following soil is most suitable for veg<br>Sandy<br>Clay loam                                     | getable<br>(B)<br>(d)  | s?<br>Sandy Loam<br>Clay   |
| 145. | The se<br>(A)<br>(C)        | red required for one hectare sowing of carrot<br>1-2 kg<br>4-5 kg  | is<br>(B)<br>(D)       | 10-15 kg<br>15-20 kg   |
| 146. | The m<br>(A)<br>(C)         | ain reason for blanching of fruits and vegetal<br>To make them soft<br>To make the products taste better | bles is:<br>(B)<br>(D) | To inactivate enzymes<br>For long term preservation of products                      |
| 147. | What i<br>(A)               | s Canning<br>Placing of foods in sealed metal<br>containers  | (B)                    | Storage of foods in hermetically sealed containers                                   |
| 148. | (C)<br>What i<br>(A)<br>(C) | Placing cans in retorts<br>is Brine<br>A solution of sugar and water<br>A solution of vinegar and water  | (D)<br>(B)<br>(D)      | None of these<br>A solution of salt and water<br>An additive used in food processing |
|      |                             |  |                        |  |

| 149. | The m<br>(A)<br>(C)           | nost economical way of drying fruits and vego<br>Solar drying<br>Mechanical drying                                       | etables<br>(B)<br>(D)            | o is<br>Oven drying<br>None of these   |
|------|-------------------------------|--|----------------------------------|--|
| 150. | Preser<br>(A)<br>(C)          | rvative used in tomato Ketchup is<br>Potassium Metabisulphite<br>Citric acid   | (B)<br>(D)                       | Sodium Benzoate<br>None of these   |
| 151. | While<br>(A)<br>(C)           | walking on smooth surface one should take<br>Large friction<br>Larger normal force                                       | small s<br>(B)<br>(D)            | steps to ensure<br>Small friction<br>Smaller normal force  |
| 152. | What<br>and tin<br>(A)<br>(C) | happens to a vehicle travelling in an unbanke<br>res suddenly disappears<br>Moves along tangent<br>Moves radially out    | ed curv<br>(B)<br>(D)            | Moves radially in<br>Moves along the curve   |
| 153. | A ball<br>chang<br>(A)<br>(C) | of mass 0.2 kg strikes an obstacle and move<br>these from 20m/s to 10m/s the magnitude of imp $2\sqrt{7}$<br>$2\sqrt{5}$ | s at 60<br>oulse r<br>(B)<br>(D) | $^{0}$ to its initial direction. If its speed<br>received by the ball isNs<br>$2\sqrt{3}$<br>$3\sqrt{2}$ |
| 154. | A spa<br>of ma<br>(A)<br>(C)  | cecraft of mass 2000kg moving with 600 m/s<br>ss 500 kg is stationary. The velocity of other<br>600<br>1500              | sudde<br>part in<br>(B)<br>(D)   | enly explodes into two pieces. One piece<br>m/s is<br>800<br>1000  |
| 155. | 16                            | kg 8 kg 4 kg The f   | orce c                           | on 16 kg is?   |
|      | (A)<br>(C)                    | 140N<br>100N   | (B)<br>(D)                       | 120N<br>80N  |
| 156. | A mai                         | n of mass 40 kg is at rest between the walls. I  | f coeff                          | f. of friction between man and wall is   |

0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



| (A) | 100 N |
|-----|-------|
| (C) | 80 N  |

| (B) | 250 N |
|-----|-------|
| (D) | 50 N  |

|      | Find minimum height in terms of D to complete th   | e loop                           |  |
|------|--|----------------------------------|--|
|      | <ul><li>(A) 7D/4</li><li>(C) 5D/4</li></ul>  | (B)<br>(D)                       | 9D/4<br>3D/4   |
| 158. | <ul> <li>Gravitational force between two bodies is F. The s liquid of specific gravity 3. The gravitational force (A) F/9</li> <li>(C) F</li> </ul>      | pace as<br>will b<br>(B)<br>(D)  | round the mass is now filled with a<br>e<br>3F<br>F/3  |
| 159. | <ul><li>A man weighs 75 kg on the surface of earth. His w</li><li>(A) infinity</li><li>(C) zero</li></ul>  | veight o<br>(B)<br>(D)           | on the geostationary satellite is<br>150kg<br>75/2 kg  |
| 160. | <ul> <li>g at a depth of 1600 km inside the earth in m/s/s is</li> <li>(A) 6.65</li> <li>(C) 8.65</li> </ul>   | s<br>(B)<br>(D)                  | 7.35<br>4.35   |
| 161. | A block of mass 19 M is suspended by a string of<br>embedded in it. If the block completes the vertica<br>(A) 140<br>(C) $20\sqrt{9.8}$                  | length<br>l circle<br>(B)<br>(D) | 1m. A bullet of mass M hits it and gets<br>the velocity of bullet in m/s is<br>$20\sqrt{19.6}$<br>20 |
| 162. | A rubber ball falls from a height of 4m and rebour<br>impact is<br>(A) 20<br>(C) 23  | (B)<br>(D)                       | .5m. The % loss of energy during the<br>62.5<br>60   |
| 163. | <ul> <li>25 kg of sand is deposited each second on a converge required to maintain the belt in motion is</li> <li>(A) 2600W</li> <li>(C) 325W</li> </ul> | yor bel<br>(B)<br>(D)            | 250W<br>2500W  |
| 164. | A uniform rod of mass M and length L standing versibility of the bottom. The moment of inertia will (A) $ML^{2}/3$ (C) $ML^{2}/9$                        | ertically<br>be<br>(B)<br>(D)    | y on a horizontal floor falls without $ML^{2}/6$ $ML^{2}/12$   |
| 165. | If the velocity of C.M of a rolling body is V, then<br>(A) $\sqrt{2V}$<br>(C) $2V$   | velocit<br>(B)<br>(D)            | y of highest point in the body will be $V = V/\sqrt{2}$  |
| 166. | The angular momentum of two rotating bodies are<br>of their rotational K.E is<br>(A) 1:2<br>(C) 1:4  | equal.<br>(B)<br>(D)             | If the ratio of their M.I is 1:4, the ratio<br>2:1<br>4:1  |

157.

| 167. | The le<br>/s is (t        | evel of water in a tank is 5m. A hole $1 \text{ cm}^2$ is ake $g=10 \text{ m/s/s}$  | made                           | at the bottom. The rate of leakage in m <sup>3</sup>                                      |
|------|---------------------------|---|--------------------------------|---|
|      | (A)                       | 10-3  | (B)                            | 10-4  |
| 1.60 | (C)                       |   | (D)                            |   |
| 168. | Two b $3/5^{\text{th}}$ o | blocks A and B float in water. A floats with L  | 4 <sup>th</sup> of<br>sities i | its volume immersed and B floats with   |
|      | (A)                       | 5:12  | (B)                            | 12:5  |
|      | (C)                       | 3:20  | (D)                            | 20:3  |
| 169. | The te liquid             | erminal velocity of a spherical ball of lead of a varies with R such that   | radius                         | R is V while falling through a viscous  |
|      | (A)<br>(C)                | V/R is constant<br>V is constant  | (B)<br>(D)                     | VR is constant $V/R^2$ is constant  |
| 170. | A hyd                     | raulic press uses a piston of 100 cm <sup>2</sup> to exert a  | a force                        | e of $10^7$ dynes on water. The area of the   |
|      | other j                   | piston that supports a mass of 2000 kg is (tak $\frac{100}{2}$  | e g = 1                        | 10m/s/s)  |
|      | (A)                       | $100 \text{cm}^2$<br>2 x $10^4 \text{cm}^2$   | (B)                            | 10  cm<br>2 x $10^{10} \text{ cm}^2$  |
| 1.51 | (C)                       |   | (D)                            | $2 \times 10^{\circ}$ cm  |
| 171. | When<br>throug<br>The ve  | kerosene and coconut oil of coeff. of viscosi<br>gh the same pipe, under same pressure differe<br>olume of kerosene that flows is | ty 0.00<br>nce an              | 12 and 0.0154 Ns/m <sup>2</sup> are followed and same time collects 1 lit of coconut oil. |
|      | (A)                       | 5.5 lit   | (B)                            | 6.6 lit   |
|      | (C)                       | 7.7 lit   | (D)                            | 8.8 lit   |
| 172. | There                     | is a circular hole in metal plate. When the pla   | ate is l                       | neated the radius of the hole becomes   |
|      | (A)                       | increased   | (B)                            | decreased   |
|      | (C)                       | unchanged   | (D)                            | depends on metal  |
| 173. | Specif<br>given           | fic heat of a substance depends on 1. Nature of to substance  | of subs                        | stance. 2. Mass of substance. 3. Heat   |
|      | (A)                       | Only one is correct   | (B)                            | Both 1 and 2 are correct  |
|      | (C)                       | All are correct   | (D)                            | Only 1 and 3 are correct  |
| 174. | In a gi                   | ive process dW=0, dq is <0 then for a gas   |                                |   |
|      | (A)                       | Temperature increases   | (B)                            | Volume decreases  |
|      | (C)                       | Pressure increases  | (D)                            | Pressure decreases  |
| 175. | The ef                    | fficiency of carnot engine depends on   |                                |   |
|      | (A)                       | Working substance   | (B)                            | Sink temperature  |
|      | (C)                       | Source temperature  | (D)                            | Both B and C  |
| 176. | A 200<br>with e           | turn coil of self inductance 30 mH carries a cach turn of coil  | curren                         | t of 5 mA. Find the magnetic flux linked  |
|      | (A)                       | $7.5 \times 10^{-7} \text{Wb}$  | (B)                            | 1.6 x 10 <sup>-7</sup> Wb   |
|      | (C)                       | $3 \times 10^{-7} Wb$   | (D)                            | 1.5 x 10 <sup>-7</sup> Wb   |
| 177. | The in time the           | nstantaneous value of current in an AC circuit he current will be maximum?  | is I =                         | 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first   |
|      | (A)                       | 1/100 s   | (B)                            | 1/200 s   |
|      | (C)                       | 1/500 s   | (D)                            | 1 s   |
| 178. | What                      | in electric system represents force in mechan   | ical sv                        | vstem ?   |
|      | (A)                       | L   | (B)                            | Ι   |
|      | (C)                       | 1/C   | (D)                            | Q   |
|      |                           |   |                                |   |
- 179. A capacitor of 1  $\mu$ F is charged with 0.01C of electricity. How much energy is stored in it? (A) 30 J (B) 40 J
  - (A) 30 J (C) 50 J

181.

- J (D) 60 J
- 180. An electromagnetic wave is travelling in vacuum with a speed of  $3 \times 10^8$  m/s. Find the velocity in a medium having relative electric and magnetic permeability 2 and 1, respectively. (A)  $3/\sqrt{2} \times 10^8$ m/s (B)  $1.5 \times 10^8$ m/s
  - (A)  $3/\sqrt{2} \times 10^8 \text{m/s}$  (B)  $1.5 \times 10^8 \text{m/s}$ (C)  $2 \times 10^8 \text{m/s}$  (D) No change
  - Trace the path of ray of light passing through a glass prism as shown in the figure. If the



182. Light wave from two coherent sources of intensities in ratio 64:1 produces interference. Calculate the ration of maximum and minima of the interference pattern.

| (A) | 8:1 | (B) | 64:1  |
|-----|-----|-----|-------|
| (C) | 9:7 | (D) | 81:49 |

183. In young's experiment, the width of the fringes obtained with light of wavelength 6000 A° is 2 mm. What will be the fringe width, if the entire apparatus is immersed in a liquid of refractive index 1.33?

| (A) | 1 mm | (B) | 1.5 mm |
|-----|------|-----|--------|
| (C) | 2 mm | (D) | 2.5 mm |

184. Unpolarised light is incident on plane glass surface. What should be the angle of incidence in degrees, so that the reflected and refracted rays are perpendicular to each other? (A) 37 (B) 47

| (11) | 51 | (D) | - <b>T</b> / |
|------|----|-----|--------------|
| (C)  | 57 | (D) | 67           |

185. Determine the de-Broglie wavelength associated with an electron, accelerated through a potential difference of 100 V.

| (A) | 1.227A <sup>o</sup> | (B) | 12.27A° |
|-----|---------------------|-----|---------|
| (C) | 122.7A°             | (D) | 1227A°  |

186. A particle with rest mass  $m_0$  is moving with velocity c. What is the de-Broglie wavelength associated with it?

| (A) | infinity   | (B) | zero  |
|-----|------------|-----|-------|
| (C) | radio wave | (D) | X ray |

187. Which among the following series gives visible light?

| (A)            | Lyman | (B) | Balmer    |
|----------------|-------|-----|-----------|
| $(\mathbf{C})$ | D     | (D) | Mana afd. |

(C) Bracket (D) None of these

188. Identify the logic operation performed by this circuit



189. The number of silicon atoms per m<sup>3</sup> is 5 x 10<sup>28</sup>. This is doped simultaneously with 5 x 10<sup>22</sup> atoms per m<sup>3</sup> of arsenic and 5 x 10<sup>20</sup> atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ .

| (A) | $4.54 \times 10^{9} \text{m}^{-3}$ | (B) | $4.95 \times 10^{22} \text{m}^{-3}$ |
|-----|------------------------------------|-----|-------------------------------------|
| (C) | $1.5 \ge 10^{16} \text{m}^{-3}$    | (D) | $5 \times 10^{28} \text{m}^{-3}$    |

190. Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre on the positive charge side along the axial line.

| (A) | 4.5 x 10 <sup>5</sup> N/C  | (B) | 4.5 x 10°NC               |
|-----|----------------------------|-----|---------------------------|
| (C) | 4.5 x 10 <sup>-5</sup> N/C | (D) | 4.5 x 10 <sup>-5</sup> NC |

- 191. If the Gaussian surface is so chosen that there are some charges inside and some outside than the electric field is due to
  - (A) Only inside charges (B) Only outside charges
  - (C) All the charges (D) Cannot determine
- 192. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



r

193. Net capacitance of 3 identical capacitor in series is  $1 \mu F$ . What is the net capacitance in  $\mu F$  if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

194. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

195. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be (A) = 0.5(B) 1

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

## 196.

Find current in the following circuit  $2\Omega$   $1\Omega$   $2\Omega$   $2\Omega$ (A) 1A (C) 3A (B) 2A (D) 4A

197. Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find the midpoint of the axis between them if same current I flows through both loops.

| (A) | $\mu_0 I/2^{3/2} r$ | (B) | $\mu_0 2 I/2^{3/2} r$ |
|-----|---------------------|-----|-----------------------|
| (C) | $\mu_0 I/4\pi r$    | (D) | Cannot be determined  |

198. A block of mass 4 kg is kept on a rough horizontal surface. The coefficient of static friction is 0.8. If a force of 19 N is applied on the block parallel to the floor, then the force of friction between the block and floor is:

| (A) | 19N | (B) | 18 N |
|-----|-----|-----|------|
| (C) | 16N | (D) | 9.8N |

## Current in a circuit falls steadily from 2A to 0A in 10 ms. Calculate L if emf induced is 200V. 199.

- (A) 1H(B) 2H 4H (D)
  - (C)3Н

Self inductance of the air core inductor increases from 0.01 mH to 10 mH on introducing an iron 200. core. What is the relative permeability of the core used?

- (A) 500 (B) 800 (C)
  - 900 (D) 1000

| Sr.<br>No | Question   |            |  |
|-----------|--|------------|--|
| INU.      |  |            |  |
| 1.        | Crossing over occurs in meiosis I during:  |            |  |
|           | (A) Metaphase  | (B)        | Telophase                              |
|           | (C) Anaphahse  | (D)        | Pachytene                              |
| 2.        | Power house of the cell:   |            |  |
|           | (A) Golgi body   | (B)        | Ribosomes                              |
|           | (C) Mitochondria   | (D)        | Lysosomes                              |
| 3.        | Genetics is the study of:  |            |  |
|           | (A) Heredity   | (B)        | Variation                              |
|           | (C) Both A and B   | (D)        | None of these                          |
| 4.        | In sex -linked inheritance, characters are pass                                  | ed from    | n father to the grandsons through his: |
|           | (A) Daughter   | (B)        | Son                                    |
|           | (C) Both daughter and son  | (D)        | Any of them                            |
| 5.        | Which of the following bases is not present in                                   | RNA        |  |
|           | (A) II 'I  |            |  |
|           | (A) Uracil   | (B)        | Thymine                                |
|           | (C) Adenine  | (D)        | Cytosine                               |
| 6.        | Mendel's principle of independent assortment                                     | can be     | e demonstrated through:                |
|           | (A) Monohybrid cross   | (B)        | Dihybrid cross                         |
|           | (C) Both A and B   | (D)        | Any of them                            |
| 7.        | On hydrolysis, maltose gives   |            |  |
|           | (A) $glucose + glucose$  | (B)        | glucose + lactose                      |
|           | (C) glucose + fructose   | (D)        | glucose + galactose                    |
| 8.        | A dipeptide has peptide bonds.   |            |  |
|           | (A) Three  | (B)        | One                                    |
|           | (C) Two  | (D)        | None of them                           |
| 9.        | Which vitamin can be synthesized by green p                                      | lants a    | nd various micro-oraganisms            |
|           | but not by mammals? $(A) = A \operatorname{spartial} a \operatorname{spart}^{d}$ | <b>(D)</b> | Dontothonia asid                       |
|           | (C) Thiamine   | (B)<br>(D) | Retinol                                |
|           |  | (2)        |  |
| 10.       | Bacterial cell wall is made up of:   |            |  |
|           | (A) Chitin   | (B)        | Cellulose                              |
|           | (C) Peptidoglycan  | (D)        | All the above                          |
|           |  |            |  |

| 11. | Plant                         | viruses are generally of:                          |                |                    |
|-----|-------------------------------|--|----------------|--------------------|
|     | (A)                           | KNA<br>mRNA  | (B)            | DNA<br>tRNA        |
|     | (C)                           | IIIKIVA  | (D)            |                    |
| 12. | Gram                          | positive aerobic, filamentous bacteria wi          | th hyp         | phae are known as: |
|     | (A)                           | Algae  | (B)            | Actinomycetes      |
|     | (C)                           | Bacteria   | (D)            | Fungi              |
| 12  | Conu                          | argion of organic matter in to simple incr         | ania           | forms is called:   |
| 15. | (A)                           | Immobilization                                     | (B)            | Mineralization     |
|     | (C)                           | Co <sub>2</sub> fixation                           | (D)            | Nitrification      |
| 14  | Erroo                         | $\sim corbon (\sim C/N ratio) loads to rate of do$ |                | acition            |
| 14. | Exces (A)                     | Slow   | (B)            | Fast               |
|     | (C)                           | Optimum  | (D)            | None               |
| 1.5 |                               |  |                |                    |
| 15. | $N_2$ fix                     | curst curst cyanobacteria are known as:            | <b>(D)</b>     | Alzinatas          |
|     | $(\mathbf{A})$ $(\mathbf{C})$ | Spores   | $(\mathbf{D})$ | Heterocyst         |
|     | (-)                           |  |                |                    |
| 16. | Lives                         | tock is important source of:                       |                |                    |
|     | (A)                           | Milk   | (B)            | Meat               |
|     | (C)                           | Manure   | (D)            | All of these       |
| 17. | Dairy                         | cattle and buffalo can be called as:               |                |                    |
|     | (A)                           | Caprine  | (B)            | Ovine              |
|     | (C)                           | Bovine   | (D)            | Equine             |
| 18. | Best l                        | breed of buffalo in India:                         |                |                    |
|     | (A)                           | Nili Ravi  | (B)            | Murrah             |
|     | (C)                           | Surti  | (D)            | Toda               |
| 19  | Best 1                        | aver noultry strain is:                            |                |                    |
| 17. | (A)                           | WLH  | (B)            | Minorca            |
|     | (C)                           | Karaknath  | (D)            | Sutlez             |
| 20  | Norm                          | al hirth weight (Kg) of healthy buffalo o          | alfig          |                    |
| 20. | (A)                           | 20   | (B)            | 30                 |
|     | (C)                           | 40   | (D)            | 50                 |
|     |                               |  |                |                    |
| 21. | Numl                          | ber of teats in buffalo:                           | $(\mathbf{D})$ | 4                  |
|     | (A)                           | 2<br>6   | (В)<br>(D)     | 4<br>8             |
|     | $(\mathbf{c})$                | v  | (1)            | 0                  |

| 22. | Dry matter requirement (kg) of a cow weighing<br>(A) 8<br>(C) 12  | g 400<br>(B)<br>(D)    | kg is:<br>10<br>14                                   |
|-----|---|------------------------|--|
| 23. | Green fodder requirement of adult cattle (kg):<br>(A) 30<br>(C) 50  | (B)<br>(D)             | 40<br>60   |
| 24. | <ul><li>Which of the following crops is the best for ha</li><li>(A) Jowar</li><li>(C) Berseem</li></ul>                         | y mak<br>(B)<br>(D)    | ing:<br>Bajra<br>Oat                                 |
| 25. | Normal body temperature of healthy poultry by<br>(A) 37.0<br>(C) 107.0  | ird (°F<br>(B)<br>(D)  | 5):<br>98.6<br>117.0                                 |
| 26. | <ul><li>ICAR-National Dairy Research Institute (NDR</li><li>(A) Karnal</li><li>(C) Bareilly</li></ul>                           | CI) is l<br>(B)<br>(D) | ocated at:<br>New Delhi<br>Anand                     |
| 27. | <ul><li>Excessive gas accumulation in rumen indicates</li><li>(A) Impaction</li><li>(C) Milk fever</li></ul>                    | 5:<br>(B)<br>(D)       | Bloat<br>Foot and Mouth Disease                      |
| 28. | <ul><li>Most fatal disease in farm animals is:</li><li>(A) Foot and Mouth Disease</li><li>(C) Rinderpest</li></ul>              | (B)<br>(D)             | HS<br>Anthrax  |
| 29. | Semen is stored in liquid nitrogen at (°C):<br>(A) -79<br>(C) 79  | (B)<br>(D)             | -196<br>196  |
| 30. | <ul><li>During Artificial Insemination (AI) semen sho</li><li>(A) Vagina</li><li>(C) Uterus</li></ul>                           | uld be<br>(B)<br>(D)   | e deposited<br>Cervix<br>Fallopian tube              |
| 31. | <ul> <li>Seeds of groundnut contain about:</li> <li>(A) 25% oil and 50% protein</li> <li>(C) 40% oil and 40% protein</li> </ul> | (B)<br>(D)             | 20% oil and 40% protein 50% oil and 25% protein      |
| 32. | <ul><li>Organic carbon is a measure of</li><li>(A) Available nitrogen in soil</li><li>(C) Excess of carbon in soil</li></ul>    | (B)<br>(D)             | Available nutrient in soil<br>Excess of iron in soil |

| 33. | Whic                 | h among the following element is conside   | ered in          | nmobile in the plant   |
|-----|----------------------|--|------------------|--|
|     | (A)                  | Calcium  | (B)              | Phosphorus   |
|     | (C)                  | Nitrogen   | (D)              | Magnesium  |
| 34. | Whic                 | h among the following is recommended v   | variety          | of durum wheat:  |
|     | (A)                  | HD 2960  | (B)              | WH 896   |
|     | (C)                  | PBW 725  | (D)              | WH 711   |
| 35. | Recon<br>(A)<br>(C)  | mmended dose of nutrients for berseem (l<br>10 kg N, 28 kg P <sub>2</sub> O <sub>5</sub><br>20 kg N, 40 kg P <sub>2</sub> O <sub>5</sub> | (B)<br>(D)       | e) is:<br>40 kg N, 25 kg P <sub>2</sub> O <sub>5</sub><br>20 kg N, 20 kg P <sub>2</sub> O <sub>5</sub> |
| 36. | Optin<br>(A)<br>(C)  | num row spacing for cotton is:<br>50 cm<br>67.5 cm   | (B)<br>(D)       | 60 cm<br>75 cm   |
| 37. | Optin                | num sowing time of summer moong in th  | e state          | e is:  |
|     | (A)                  | March  | (B)              | Second fortnight of February   |
|     | (C)                  | First fortnight of April   | (D)              | End June-early July  |
| 38. | 'Whit<br>(A)<br>(C)  | te alkali' soil refers to:<br>Acid soil<br>Salina sodic soil   | (B)<br>(D)       | Saline soil<br>Sodic soil  |
| 39. | The e                | exchange sodium percentage (ESP) of alka   | ali soi          | ls is always:  |
|     | (A)                  | More than 15   | (B)              | Any value  |
|     | (C)                  | Less than 15   | (D)              | Less than 7.5  |
| 40. | ICAR                 | R-Central Arid Zone Research Institute is  | locate           | ed at:   |
|     | (A)                  | Nagpur   | (B)              | Hyderabad  |
|     | (C)                  | New Delhi  | (D)              | Jodhpur  |
| 41. | India<br>(A)<br>(C)  | is divided in to ecological zones.<br>12<br>15   | (B)<br>(D)       | 10<br>20   |
| 42. | Reco                 | mmended seed rate (kg/ha) of dhaincha or   | r sunh           | emp for green manuring is:   |
|     | (A)                  | 20   | (B)              | 30   |
|     | (C)                  | 40   | (D)              | 50   |
| 43. | Recon                | mmended seed rate for <i>spring</i> season mur   | ngbear           | n is   |
|     | (A)                  | 15-20 kg per acre  | (B)              | 25-30 kg per hectare   |
|     | (C)                  | 15-20 kg per hectare   | (D)              | 10 kg per hectare  |
| 44. | For tr<br>(A)<br>(C) | ransplanting of pearl millet (bajra) in Hary<br>Two weeks<br>Four weeks  | yana, (B)<br>(D) | optimum age of seedlings is:<br>Three weeks<br>Five weeks  |
|     |                      |  |                  |  |

| 45. | Blind | tillage refers to:                           |         |                                 |
|-----|-------|--|---------|---------------------------------|
|     | (A)   | Summer ploughing                             | (B)     | Primary tillage                 |
|     | (C)   | Hoeing before germination                    | (D)     | Hoeing in standing crop rows    |
| 46. | Flam  | e photometer is used for the determinatio    | n of:   |                                 |
|     | (A)   | Nitrogen                                     | (B)     | Phosphorus                      |
|     | (C)   | Potassium                                    | (D)     | Boron                           |
| 47. | Tetra | zolium test is conducted to test the:        |         |                                 |
|     | (A)   | Physical purity of seed                      | (B)     | Percentage of weed seeds        |
|     | (C)   | Viability of seed                            | (D)     | Seed germination                |
| 48. | Worl  | d Food Day is celebrated on:                 |         |                                 |
|     | (A)   | 5 June                                       | (B)     | 20 June                         |
|     | (C)   | 28 February                                  | (D)     | 16 October                      |
| 49. | Whic  | h among the following is the best and cho    | eapest  | method of weed control:         |
|     | (A)   | Cultural measures                            | (B)     | Herbicide based weed control    |
|     | (C )  | Biological control                           | (D)     | Preventive measures             |
| 50. | Black | soils in India belong to soil order:         |         |                                 |
|     | (A)   | Alfisol                                      | (B)     | Inceptisol                      |
|     | (C)   | Vertisol                                     | (D)     | Oxisol                          |
| 51. | Whic  | h among the following crop has epigeal       | germir  | nation?                         |
|     | (A)   | Sunflower                                    | (B)     | Chickpea                        |
|     | (C)   | Rice   | (D)     | Pearl millet                    |
| 52. | Whic  | h fraction of soil organic matter is soluble | e in bo | oth alkali and acid:            |
|     | (A)   | Humic acid                                   | (B)     | Fulvic acid                     |
|     | (C)   | Hymatomelonic acid                           | (D)     | Humin acid                      |
| 53. | Nitro | gen use efficiency in rice can be increase   | d by:   |                                 |
|     | (A)   | Delayed application of N                     | (B)     | Use of biofertilizers           |
|     | (C)   | Application of S-coated urea                 | (D)     | Application of blue green algae |
| 54. | Whie  | h stage of sugarcane is most critical for in | rrigati | on?                             |
|     | (A)   | Germination                                  | (B)     | Formative stage                 |
|     | (C)   | Grand growth phase                           | (D)     | Ripening stage                  |
| 55. | The l | argest producer of rapeseed-mustard in Ir    | ndia is |                                 |
|     | (A)   | Haryana                                      | (B)     | Uttar Pradesh                   |
|     | (C)   | Rajasthan                                    | (D)     | Gujarat                         |
| 56. | The t | erm Functional or Metabolic Nutrients w      | as pro  | posed by:                       |
|     | (A)   | JV Leibig                                    | (B)     | DJ Nicholas                     |
|     | (C)   | DI Arnon                                     | (D)     | Mosanoba Fukuoka                |

| 57. | <ul> <li>Botanical name of sunnhemp is</li> <li>(A) Sesbania aculeata</li> <li>(C) Carthamus tinctorium</li> </ul>          | (B)<br>(D)                               | Trifolium alexandrinum<br>Crotolaria juncea                               |
|-----|---|--|---|
| 58. | <ul> <li>The upper limit of soil moisture</li> <li>(A) PWP (15 bars)</li> <li>(C) Field capacity (1/3 bars)</li> </ul>      | e available for plant g<br>(B)<br>(D)    | rowth is:<br>Hygroscopic coefficient<br>Gravitational potential           |
| 59. | <ul><li>For which fertilizer, India is ful</li><li>(A) N fertilizers</li><li>(C) P fertilizers</li></ul>                    | ly dependent on imp<br>(B)<br>(D)        | ort?<br>K fertilizers<br>S fertilizers                                    |
| 60. | <ul><li>Agrostology is the branch of Ag</li><li>(A) Aromatic and medicinal</li><li>(C) Fodder crops</li></ul>               | gronomy that deals w<br>crops (B)<br>(D) | rith cultivation of:<br>Non edible oilseeds<br>Green manure crops         |
| 61. | <ul><li>With excessive use of nitrogen</li><li>(A) Increased</li><li>(C) Decreased</li></ul>                                | in sugarcane, the sug<br>(B)<br>(D)      | ar content in juice is:<br>Remains same<br>Not affected                   |
| 62. | Bacteria responsible for nitroge  | n fixation in soybear                    | is  |
|     | <ul><li>(A) Rhizobium leguminosaru</li><li>(C) Rhizobium phaseoli</li></ul>   | m (B)<br>(D)                             | Rhizobium japonicum<br>Rhizobium trifoli                                  |
| 63. | <ul><li>The most critical stage of irriga</li><li>(A) Silking stage</li><li>(C) Grain development stage</li></ul>           | tion in maize is:<br>(B)<br>(D)          | Tasseling stage<br>Dough stage  |
| 64. | <ul><li>Nipping in chickpea is beneficial</li><li>(A) Promote branching</li><li>(C) Check excessive vegetation</li></ul>    | al to:<br>(B)<br>ve growth (D)           | Promote flowering<br>Improve seed setting                                 |
| 65. | Quantity of urea required by wh<br>(A) 130<br>(C) 110   | neat for one acre at a<br>(B)<br>(D)     | dose of 125 kg per hectare is:<br>90<br>275                               |
| 66. | <ul> <li>Congress grass (Parthenium hy.</li> <li>(A) Chrysoperla</li> <li>(C) Zygogramma bicolorata</li> </ul>              | sterophorus) can be (B)<br>(D)           | controlled by insect:<br>Dactylopius tomentosus<br>Bacillus thuringiensis |
| 67. | <ul><li>Application of organic material leads to:</li><li>(A) N immobilization</li><li>(C) Immediate release in N</li></ul> | (B)<br>(D)                               | N leaching<br>N mineralization  |
| 68. | <ul><li>Heavy shedding of buds and bo</li><li>(A) Deficiency of N in soil</li><li>(C) Deficiency of P in soil</li></ul>     | lls in cotton occurs d<br>(B)<br>(D)     | ue to:<br>Water stress at bud formation stage<br>Excess of N is soil      |

| 69. | 'Whip tail' is brassica is due to the deficiency                                | of:            |                                    |
|-----|---|----------------|------------------------------------|
|     | (A) Calcium   | (B)            | Magnesium                          |
|     | (C) Manganese   | (D)            | Zinc                               |
| 70. | Which kind of soil mineralogy has the highes                                    | t 'cati        | on exchange capacity':             |
|     | (A) Kaolinite   | (B)            | Illite                             |
|     | (C) Montmorillonite   | (D)            | Humus                              |
| 71. | Optimum row spacing for fodder crops is:  |                |                                    |
|     | (Å) 30 cm   | (B)            | 60 cm                              |
|     | (C) 45 cm   | (D)            | 75 cm                              |
| 72. | The balance sheet of a dairy farm represent:                                    |                |                                    |
|     | (A) Assets  | (B)            | Liabilities                        |
|     | (C) Both (A) and (B)  | (D)            | None of these                      |
| 73. | Main limitation in keeping farm records in Ind                                  | lia is:        |                                    |
|     | (A) Illiteracy  | (B)            | Nature of farming                  |
|     | (C) Big size of holding   | (D)            | None of these                      |
| 74. | Profit and loss account is a type of:   |                |                                    |
|     | (A) Personal account  | (B)            | Real account                       |
|     | (C) Nominal account   | (D)            | None of these                      |
| 75. | Which is the most prominent book for keeping                                    | g farm         | records and accounts:              |
|     | (A) Journal   | (B)            | Ledger                             |
|     | (C) Cash book   | (D)            | Purchase register                  |
| 76. | The list of all the physical property of a busine<br>point of time is known as: | ess alo        | ng with their values at a specific |
|     | (A) Assets  | (B)            | Liabilities                        |
|     | (C) Farm inventory  | (D)            | None of these                      |
| 77. | The decline in value of assets due to usage, ac known as:                       | cident         | al damage and time obsolescence is |
|     | (A) Appreciation  | (B)            | Depreciation                       |
|     | (C) Interest  | (D)            | None of these                      |
| 78. | Which of the following is not a component of                                    | farm l         | ousiness:                          |
|     | (A) Capital   | (B)            | Land                               |
|     | (C) Market  | (D)            | Labour and management              |
| 70  | Queen of Emilts is:   |                | -                                  |
| 19. | (A) Mango   | (B)            | Apple                              |
|     | (C) Litchi  | (D)            | Banana                             |
| 0.0 |   |                |                                    |
| 80. | Low chilling pears are trained by:<br>(A) Espaliar system                       | $(\mathbf{D})$ | Centre leader system               |
|     | (C) Modified leader system  | $(\mathbf{D})$ | Y trellies system                  |
|     |   | (D)            |                                    |
| 81. | Wind break established in the orchards is of:                                   |                | TL 4. TZ1 4.                       |
|     | (A) Jamun<br>(C) Karanda  | (B)            | Jnatti Knatti<br>Galgal            |
|     | (C) Karonda   | (D)            | Gaigai                             |
|     |   |                |                                    |

| 82. | Strawl<br>(A)<br>(C) | berry is propagated through:<br>Stolon<br>Crown  | (B)<br>(D)         | Runners<br>Suckers                                       |
|-----|----------------------|--|--------------------|--|
| 83. | Epicot<br>(A)<br>(C) | tyl grafting is commonly done in:<br>Guava<br>Pear   | (B)<br>(D)         | Litchi<br>Mango  |
| 84. | Daisy<br>(A)<br>(C)  | is cross between:<br>Fortune x Fremont mandarin<br><u>Citrus grandis</u> Osbeck × <u>Citrus</u><br><u>Paradisi</u> Macf. | (B)<br>(D)         | King x Willow leaf<br>Sweet orange x <i>C trifoliata</i> |
| 85. | Arunil<br>(A)<br>(C) | ka is cross between:<br>Dashehari x Neelum<br>Amrapali x Vanraj  | (B)<br>(D)         | Neelum x Dashehari<br>Sensation x Amrapali               |
| 86. | Phytop<br>(A)<br>(C) | <i>phthora</i> is controlled with the application of:<br>Ridomil<br>c. M 45  | (B)<br>(D)         | Bayleton<br>All of these                                 |
| 87. | Yellov<br>(A)<br>(C) | w pigment in papaya fruit is:<br>Xanthophyll<br>Lycopene   | (B)<br>(D)         | Carotene<br>Caricaxanthin                                |
| 88. | Which<br>(A)<br>(C)  | n garden is also referred as 'Nature in Miniat<br>Japanese<br>English  | ure:<br>(B)<br>(D) | Mughals<br>Persian                                       |
| 89. | Tree w<br>(A)<br>(C) | vith drooping inflorescence is:<br>Jacaranda mimosaefolia<br>Bassia latifolia  | (B)<br>(D)         | Salyx baylonica<br>Kigelia pinnata                       |
| 90. | Red s<br>(A)<br>(C)  | carlet is a cultivar of:<br>Radish<br>Onion  | (B)<br>(D)         | Carrot<br>Turnip   |
| 91. | Whick<br>(A)         | h of the following is a climacteric fruit?<br>Muskmelon  | (B)                | Tomato   |
|     | (C)                  | Both A and B   | (D)                | None of these  |
| 92. | Sun se<br>(A)        | calding incidence usually occurs in:<br>Brinjal  | (B)                | Tomato   |
|     | (C)                  | Muskmelon  | (D)                | Cauliflower  |

| 93.  | Sex e<br>(A)                 | expression in pointed gourd is:<br>Monoecious   | (B)                              | Andromonoecious   |
|------|------------------------------|---|----------------------------------|---|
|      | (C)                          | Dioecious   | (D)                              | Hermaphrodite   |
| 94.  | Whic<br>(A)                  | ch of the following soil is most suitable fo<br>Sandy   | r vege<br>(B)                    | etables?<br>Sandy Loam  |
|      | (C)                          | Clay loam   | (d)                              | Clay  |
| 95.  | The s (A)                    | seed required for one hectare sowing of ca<br>1-2 kg  | rrot is<br>(B)                   | s<br>10-15 kg   |
|      | (C)                          | 4-5 kg  | (D)                              | 15-20 kg  |
| 96.  | The n<br>(A)<br>(C)          | nain reason for blanching of fruits and vegeta<br>To make them soft<br>To make the products taste better                    | bles is<br>(B)<br>(D)            | :<br>To inactivate enzymes<br>For long term preservation of products                                      |
| 97.  | What (A) (C)                 | is Canning<br>Placing of foods in sealed metal<br>containers<br>Placing cans in retorts                                     | (B)<br>(D)                       | Storage of foods in hermetically sealed<br>containers<br>None of these                                    |
| 98.  | What<br>(A)<br>(C)           | is Brine<br>A solution of sugar and water<br>A solution of vinegar and water  | (B)<br>(D)                       | A solution of salt and water<br>An additive used in food processing                                       |
| 99.  | The n<br>(A)<br>(C)          | nost economical way of drying fruits and veg<br>Solar drying<br>Mechanical drying   | etables<br>(B)<br>(D)            | s is<br>Oven drying<br>None of these  |
| 100. | Prese<br>(A)<br>(C)          | rvative used in tomato Ketchup is<br>Potassium Metabisulphite<br>Citric acid  | (B)<br>(D)                       | Sodium Benzoate<br>None of these  |
| 101. | While<br>(A)<br>(C)          | e walking on smooth surface one should take<br>Large friction<br>Larger normal force  | small (B)<br>(D)                 | steps to ensure<br>Small friction<br>Smaller normal force   |
| 102. | What<br>and ti<br>(A)<br>(C) | happens to a vehicle travelling in an unbanker<br>res suddenly disappears<br>Moves along tangent<br>Moves radially out      | ed curv<br>(B)<br>(D)            | Moves radially in<br>Moves along the curve  |
| 103. | A bal<br>chang<br>(A)<br>(C) | l of mass 0.2 kg strikes an obstacle and move<br>ges from 20m/s to 10m/s the magnitude of imp<br>$2\sqrt{7}$<br>$2\sqrt{5}$ | s at 60<br>pulse r<br>(B)<br>(D) | $2^{0}$ to its initial direction. If its speed<br>received by the ball isNs<br>$2\sqrt{3}$<br>$3\sqrt{2}$ |
| 104. | A spa<br>of ma<br>(A)<br>(C) | acccraft of mass 2000kg moving with 600 m/s<br>ss 500 kg is stationary. The velocity of other<br>600<br>1500                | sudde<br>part ir<br>(B)<br>(D)   | enly explodes into two pieces. One piece<br>n m/s is<br>800<br>1000                                       |

105.



106. A man of mass 40 kg is at rest between the walls. If coeff. of friction between man and wall is 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



| 113. | 25 kg of sand is deposited each second on a conveyor belt moving at 10m/s. The extra power required to maintain the belt in motion is |  |                                |  |
|------|---|--|--------------------------------|--|
|      | (A)<br>(C)  | 2600W<br>325W  | (B)<br>(D)                     | 250W<br>2500W  |
| 114. | A unit<br>slippii   | form rod of mass M and length L standing vering at the bottom. The moment of inertia will l                                      | rtically<br>be                 | y on a horizontal floor falls without  |
|      | (A)<br>(C)  | ML <sup>2</sup> /3<br>ML <sup>2</sup> /9   | (B)<br>(D)                     | $\frac{ML^{2}}{6}$ $\frac{ML^{2}}{12}$   |
| 115. | If the (A)  | velocity of C.M of a rolling body is V, then v $\sqrt{2V}$   | elocity<br>(B)                 | y of highest point in the body will be<br>V  |
|      | (C)   | 2V   | (D)                            | $V/\sqrt{2}$   |
| 116. | The an of the   | ngular momentum of two rotating bodies are a rotational K.E is   | equal.                         | If the ratio of their M.I is 1:4, the ratio  |
|      | (A)<br>(C)  | 1:2<br>1:4   | (B)<br>(D)                     | 2:1<br>4:1   |
| 117. | The le  | evel of water in a tank is 5m. A hole 1 cm <sup>2</sup> is also $g = 10 \text{ m/s/c}$   | made                           | at the bottom. The rate of leakage in m <sup>3</sup>                                     |
|      | (A)   | $10^{-3}$  | (B)                            | 10-4   |
|      | (C)   | 10   | (D)                            | 10 <sup>-2</sup>   |
| 118. | Two b $3/5^{\text{th}}$ o   | blocks A and B float in water. A floats with $1/2$ if its volume immersed. The ratio of their den                                | /4 <sup>m</sup> of<br>sities i | its volume immersed and B floats with  |
|      | (A)<br>(C)  | 3:20   | (B)<br>(D)                     | 20:3   |
| 119. | The te<br>liquid  | erminal velocity of a spherical ball of lead of a varies with R such that  | radius                         | R is V while falling through a viscous   |
|      | (A)<br>(C)  | V/R is constant<br>V is constant   | (B)<br>(D)                     | VR is constant $V/R^2$ is constant   |
| 120. | A hyd<br>other  | raulic press uses a piston of 100 cm <sup>2</sup> to exert a piston that supports a mass of 2000 kg is (tak                      | a force<br>e g = 1             | $c of 10^7 dynes on water. The area of the 10m/s/s$                                      |
|      | (A)<br>(C)  | $100 \text{cm}^2$<br>2 x 10 <sup>4</sup> cm <sup>2</sup>   | (B)<br>(D)                     | $10^9 \text{ cm}^2$<br>2 x $10^{10} \text{ cm}^2$  |
| 121. | When<br>throug<br>The ve  | kerosene and coconut oil of coeff. of viscosing<br>the same pipe, under same pressure differe<br>plume of kerosene that flows is | ty 0.00<br>nce an              | 02 and 0.0154 Ns/m <sup>2</sup> are followed id same time collects 1 lit of coconut oil. |
|      | (A)<br>(C)  | 5.5 lit<br>7 7 lit   | (B)<br>(D)                     | 6.6 lit<br>8 8 lit   |
| 122. | There   | is a circular hole in metal plate. When the plate  | ate is h                       | neated the radius of the hole becomes  |
|      | (A)<br>(C)  | increased<br>unchanged   | (B)<br>(D)                     | decreased<br>depends on metal  |
| 123. | Specif<br>given   | fic heat of a substance depends on 1. Nature of the substance  | of subs                        | tance. 2. Mass of substance. 3. Heat   |
|      | (A)<br>(C)  | Only one is correct<br>All are correct   | (B)<br>(D)                     | Both 1 and 2 are correct<br>Only 1 and 3 are correct                                     |
| 124  | Inam  | ive process $dW=0$ dg is <0 then for a gas   | (-)                            | ,  |
|      | (A)   | Temperature increases  | (B)                            | Volume decreases   |
|      | (C)   | Pressure increases   | (D)                            | Pressure decreases   |

| 125. | The ex<br>(A)<br>(C)            | fficiency of carnot engine depends on<br>Working substance<br>Source temperature  | (B)<br>(D)                       | Sink temperature<br>Both B and C  |
|------|---------------------------------|---|----------------------------------|---|
| 126. | A 200<br>with e<br>(A)<br>(C)   | ) turn coil of self inductance 30 mH carries a<br>each turn of coil.<br>7.5 x 10 <sup>-7</sup> Wb<br>3 x 10 <sup>-7</sup> Wb                    | curren<br>(B)<br>(D)             | t of 5 mA. Find the magnetic flux linked<br>$1.6 \times 10^{-7}$ Wb<br>$1.5 \times 10^{-7}$ Wb                      |
| 127. | The ir<br>time t<br>(A)<br>(C)  | nstantaneous value of current in an AC circuit<br>he current will be maximum?<br>1/100 s<br>1/500 s   | t is I = $(B)$ $(D)$             | 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first<br>1/200 s  |
| 128. | What<br>(A)<br>(C)              | in electric system represents force in mechan<br>L<br>1/C   | ical sy<br>(B)<br>(D)            | rstem ?<br>I<br>q   |
| 129. | A cap<br>(A)<br>(C)             | acitor of 1 µF is charged with 0.01C of electr<br>30 J<br>50 J  | ricity.<br>(B)<br>(D)            | How much energy is stored in it?<br>40 J<br>60 J  |
| 130. | An ele<br>a med<br>(A)<br>(C)   | ectromagnetic wave is travelling in vacuum w<br>lium having relative electric and magnetic per<br>$3/\sqrt{2} \ge 10^8$ m/s<br>$2 \ge 10^8$ m/s | vith a s<br>rmeabi<br>(B)<br>(D) | speed of 3 x $10^8$ m/s. Find the velocity in<br>ility 2 and 1, respectively.<br>$1.5 \times 10^8$ m/s<br>No change |
| 131. | Trace<br>refrac                 | the path of ray of light passing through a glastive index of glass is $\sqrt{3}$ , find out the value of  | ss pris<br>Fangle                | m as shown in the figure. If the of emergence from prism.   |
|      |                                 | 60  |                                  |   |
|      | (A)<br>(C)                      | 30<br>60  | (B)<br>(D)                       | 45<br>75  |
| 132. | Light<br>the rat<br>(A)<br>(C)  | wave from two coherent sources of intensitie<br>tion of maximum and minima of the interfere<br>8:1<br>9:7                                       | s in ra<br>nce pa<br>(B)<br>(D)  | tio 64:1 produces interference. Calculate<br>attern.<br>64:1<br>81:49   |
| 133. | In you<br>mm. V<br>index<br>(A) | ing's experiment, the width of the fringes obt<br>What will be the fringe width, if the entire app<br>1.33?<br>1 mm                             | ained<br>paratus<br>(B)          | with light of wavelength 6000 A° is 2<br>s is immersed in a liquid of refractive<br>1.5 mm                          |
|      | (C)                             | 2 mm  | (D)                              | 2.5 mm  |
| 134. | Unpol<br>degree<br>(A)<br>(C)   | larised light is incident on plane glass surface<br>es, so that the reflected and refracted rays are<br>37<br>57                                | e. Wha<br>perper<br>(B)<br>(D)   | at should be the angle of incidence in<br>ndicular to each other?<br>47<br>67                                       |

- 135. Determine the de-Broglie wavelength associated with an electron, accelerated through a potential difference of 100 V.
  - $\begin{array}{cccc} (A) & 1.227A^{\circ} & (B) & 12.27A^{\circ} \\ (C) & 122.7A^{\circ} & (D) & 1227A^{\circ} \end{array}$
- 136. A particle with rest mass  $m_0$  is moving with velocity c. What is the de-Broglie wavelength associated with it?

| (A) | infinity   | (B) | zero  |
|-----|------------|-----|-------|
| (C) | radio wave | (D) | X ray |

- 137. Which among the following series gives visible light?
  - (A) Lyman(B) Balmer(C) Bracket(D) None of these
- 138. Identify the logic operation performed by this circuit



- 139. The number of silicon atoms per m<sup>3</sup> is 5 x 10<sup>28</sup>. This is doped simultaneously with 5 x 10<sup>22</sup> atoms per m<sup>3</sup> of arsenic and 5 x 10<sup>20</sup> atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ .
  - (A)  $4.54 \times 10^{9} \text{m}^{-3}$ (B)  $4.95 \times 10^{22} \text{m}^{-3}$ (D)  $5 \times 10^{28} \text{m}^{-3}$
- 140. Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre on the positive charge side along the axial line.
  - (A)  $4.5 \times 10^{5}$ N/C (B)  $4.5 \times 10^{5}$ N/C (D)  $4.5 \times 10^{-5}$ N/C (D)  $4.5 \times 10^{-5}$ NC
- 141. If the Gaussian surface is so chosen that there are some charges inside and some outside than the electric field is due to
  - (A) Only inside charges (B) Only outside charges
  - (C) All the charges (D) Cannot determine

142. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



143. Net capacitance of 3 identical capacitor in series is  $1 \mu F$ . What is the net capacitance in  $\mu F$  if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

144. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

145. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

146.



<sup>14 |</sup> P C A C

| 147. | Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find the midpoint of the axis between them if same current I flows through both loops.<br>(A) $\mu_1 I/2^{3/2} r$ (B) $\mu_2 I/2^{3/2} r$ |   |                               |   |  |
|------|--|---|-------------------------------|---|--|
|      | $(\mathbf{C})$   | $\mu_0 I/2 \pi$ r   | (D)<br>(D)                    | Cannot be determined  |  |
| 148. | A bloc<br>0.8. If<br>betwe<br>(A)  | ck of mass 4 kg is kept on a rough horizontal<br>a force of 19 N is applied on the block paral<br>en the block and floor is:<br>19N   | surfac<br>lel to t<br>(B)     | e. The coefficient of static friction is<br>he floor, then the force of friction<br>18 N  |  |
|      | (C)  | 16N   | (D)                           | 9.8N  |  |
| 149. | Curren<br>(A)<br>(C)   | nt in a circuit falls steadily from 2A to 0A in<br>1H<br>3H   | 10 ms.<br>(B)<br>(D)          | Calculate L if emf induced is 200V.<br>2H<br>4H   |  |
| 150. | Self ir<br>core. V<br>(A)<br>(C)   | nductance of the air core inductor increases fr<br>What is the relative permeability of the core u<br>500<br>900  | om 0.0<br>ised?<br>(B)<br>(D) | 01 mH to 10 mH on introducing an iron<br>800<br>1000  |  |
| 151. | Amon<br>(A)<br>(C)   | g the following, the most stable complex is<br>$[Fe (H_2O)_6]^{3^+}$<br>$[Fe (C_2O_4)_3]^{3^-}$   | (B)<br>(D)                    | $[Fe (NH_3)_6]^{3+}$<br>$[Fe (Cl)_6]^{3-}$  |  |
| 152. | Which<br>metal<br>(A)<br>(C)   | n is the correct coordination number (C.N) an<br>atom in [Co(NH <sub>3</sub> ) <sub>2</sub> (H <sub>2</sub> O) <sub>2</sub> Cl <sub>2</sub> ] <sup>+</sup> ?<br>C.N=3, O.N=+1<br>C.N=6, O.N=+1  | d oxid<br>(B)<br>(D)          | ation number (O.N) of the transition<br>C.N=4, O.N=+2<br>C.N=6, O.N=+3  |  |
| 153. | In a so<br>cation<br>(A)<br>(C)  | blid, oxide ions are arranged in ccp, cations A<br>B occupy one third of the octahedral voids.<br>ABO <sub>3</sub><br>AB <sub>3</sub> O   | occup<br>Гhe fo<br>(B)<br>(D) | by one sixth of the tetrahedral voids and<br>rmula of the solid is:<br>A <sub>3</sub> BO<br>A <sub>3</sub> B <sub>3</sub> O <sub>3</sub>  |  |
| 154. | On mi<br>Which   | ixing acetone to methanol some of the hydrog<br>n of the following statements is correct about  | gen bor<br>the ab             | nds between methanol molecules break.<br>ove process?   |  |
|      | (A)<br>(C)   | At specific composition methanol acetone<br>mixture will form minimum boiling<br>azeotrope and show positive deviation<br>from Raoult's law<br>At specific composition methanole<br>acetone mixture will form minimum<br>boiling azeotrope and show negative<br>deviation from Raoult's law | (B)                           | At specific composition methanol<br>acetone mixture will form maximum<br>boiling azeotrope and show positive<br>deviation from Raoult's law<br>At specific composition methanole<br>acetone mixture will form maximum<br>boiling azeotrope and show negative<br>deviation from Raoult's law |  |
| 155. | $K_{\rm H}$ value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10 <sup>-5</sup> and 0.413, respectively. The correct arrangement of these gases in the order of their increasing  |   |                               |   |  |
|      | (A)  | formaldehyde <methane<carbon<br>dioxide<argon< td=""><td>(B)</td><td>formaldehyde&lt; carbon dioxide<br/><methane<argon< td=""></methane<argon<></td></argon<></methane<carbon<br>  | (B)                           | formaldehyde< carbon dioxide<br><methane<argon< td=""></methane<argon<>   |  |
|      | (U)  | methane <formaldehyde< td=""><td>(D)</td><td><formaldehyde< td=""></formaldehyde<></td></formaldehyde<>   | (D)                           | <formaldehyde< td=""></formaldehyde<>   |  |

| 156. | The number of faradays of electricity required for electrolytic conversion of the mole of nitrobenzene to aniline is:<br>(A) $3E$ (B) $4E$   |  |  |  |
|------|--|--|--|--|
|      |  | (D) $5F$   |  |  |
| 157. | The positive value of the standard electrode poter   | ntial of Ag <sup>+</sup> /Ag indicates that:   |  |  |
|      | (A) This redox couple is a stronger reducing agent than $H^+/H_2$ couple   | <ul> <li>(B) This redox couple is a stronger oxidizing agent than H<sup>+</sup>/H<sub>2</sub> couple</li> <li>(D) As any displayed H. from here</li> </ul> |  |  |
| 1.50 | (C) Ag can displace $H_2$ from acid  | (D) Ag can displace $H_2$ from base  |  |  |
| 158. | Milk is refrigerated in order to slow the rate of de reaction rate is due to:  | ecomposition by bacterial action. The decrease in  |  |  |
|      | <ul> <li>(A) A decrease in surface area</li> <li>(C) A decrease in the fraction of particles possessing sufficient energy.</li> </ul>  | <ul> <li>(B) A decrease in △ H for the reaction</li> <li>(D) The introduction of an alternative pathway with greater activation energy.</li> </ul>         |  |  |
| 159. | <ul> <li>Which of the following statements is not correct?</li> <li>(A) The rate of a reaction decreases with passage of time as concentration of reactants decrease</li> </ul>  | <ul><li>(B) The instantaneous rate a reaction is same at any time during the reaction</li></ul>  |  |  |
|      | <ul> <li>(C) For a zero order reaction the concentration of reactants remains changed with passage of time</li> </ul>  | (D) The rate of a reaction decreases with increase in concentration of reactant (s)  |  |  |
| 160. | Which of the following gases shows the lowest a temperatures are given in parenthesis:   | dsorption per gram of charcoal? The critical   |  |  |
|      | (A) $H_2(33K)$<br>(C) $SO_2(630K)$   | (B) $CH_4(190K)$<br>(D) $CO_2(304K)$   |  |  |
| 161. | Freundlich adsorption isotherm is given by the exstatements are false?   | xpression $x/m=kp^{1/n}$ . Which of the following  |  |  |
|      | i. When $1/n=0$ , the adsorption is indep  | endent of pressure.  |  |  |
|      | iii. When $1/n=0$ , the plot of $x/m$ vs p graph<br>iii. When $1/n=0$ , the adsorption is direct<br>iv. When $n=0$ , plot of $x/m$ vs p is a surrouted by the second | tly proportional to pressure.  |  |  |
|      | (A) i and ii   | (B) ii and iv  |  |  |
|      | (C) i and iii  | (D) all are false  |  |  |
| 162. | In the extraction of chlorine by electrolysis of an<br>the following statements are true?<br>i. $\triangle G^0$ for the overall reaction is positi<br>ii. $\triangle G^0$ for the overall reaction is negative<br>iii. $E^0$ for the overall reaction is positive<br>iv. $E^0$ for the overall reaction is negative  | aqueous solution of sodium chloride, which of<br>tive<br>ative<br>e  |  |  |
|      | (A) i and iv<br>(C) ii and iii   | (B) i and iii<br>(D) iii and iy  |  |  |
| 162  | Which of the following pairs of ions are isoclast:   | (D) In and iv  |  |  |
| 103. | (A) $NO_2^+$ and $NO_3^-$  | (B) $ClO_3^-$ and $ICl_4^-$  |  |  |

(A)  $NO_2$  and  $NO_3$ (B)  $CIO_3$  and  $ICI_4$ (C)  $XeO_3^{2^2}$  and  $PCI_3$ (D)  $CIO_3^{-1}$  and  $SO_3^{2^2}$ 

| 164.   | Whic                         | Which of the following hydrides is the strongest reducing agent?  |                                  |  |  |  |  |
|--------|------------------------------|---|----------------------------------|--|--|--|--|
|        | (A)                          | NH <sub>3</sub>   | (B)                              | PH <sub>3</sub>  |  |  |  |
|        | (C)                          | AsH <sub>3</sub>  | (D)                              | SbH <sub>3</sub>   |  |  |  |
| 165.   | Const                        | ider the reactions,   |                                  |  |  |  |  |
|        | i.                           | $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (1)$   | NO <sub>3</sub> ) <sub>2</sub> - | $+X + H_2O$  |  |  |  |
|        | ii                           | . $Zn + dil. HNO_3 (cold) \longrightarrow Zn ($   | $(NO_3)_2$                       | $+ Y + H_2O$   |  |  |  |
|        |                              | Compounds X and Y are, respectively   | У                                |  |  |  |  |
|        | (A)                          | N <sub>2</sub> O, NO  | (B)                              | $NO_2, NO_2$   |  |  |  |
|        | (C)                          | $N_2, N_2O$   | (D)                              | $NO_2$ , $NO$  |  |  |  |
| 166.   | Wher<br>mang                 | n KMnO <sub>4</sub> acts as an oxidizing agent in weakl<br>anese decreases by:  | y alkal                          | ine medium, the oxidation number of  |  |  |  |
|        | (A)                          | 1   | (B)                              | 2  |  |  |  |
|        | (C)                          | 3   | (D)                              | 5  |  |  |  |
| 167.   | Acidi<br>forma               | fied potassium dichromate solution turns greation of:   | een whe                          | en $Na_2SO_3$ is added to it due to the  |  |  |  |
|        | (A)                          | $CrSO_4$  | (B)                              | $Cr_2(SO_4)_3$   |  |  |  |
|        | (C)                          | $\operatorname{CrO_4^{2^-}}$  | (D)                              | $Cr_2(SO_3)_3$   |  |  |  |
| 168.   | The d<br>Whic<br>numb<br>(A) | l-electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$<br>h one of the following complexes will exhib<br>pers of Cr=24, Mn=25, Fe=26, Co=27)<br>$[Cr(H_2O)_6]_{-}^{2+}$ | and Co<br>it minin<br>(B)        | $^{2+}$ are d <sup>4</sup> , d <sup>5</sup> , d <sup>6</sup> and d <sup>7</sup> , respectively.<br>num paramagnetic behavior? (atomic<br>$[Mn(H_2O)_6]^{2+}$ |  |  |  |
|        | (C)                          | $\left[\mathrm{Fe}(\mathrm{H}_{2}\mathrm{O})_{6}\right]^{2+}$   | (D)                              | $[Co(H_2O)_6]^{2+}$  |  |  |  |
| 169.   | Wher is:                     | a 2-Bromopentane is heated with potassium of  | ethoxid                          | e in ethanol, the major product obtained   |  |  |  |
|        | (A)                          | 2-Ethoxypentane   | (B)                              | Pent-1-ene   |  |  |  |
|        | (C)                          | Cis-Pent-2-ene  | (D)                              | Trans-Pent-2-ene   |  |  |  |
| 170.   | Whic                         | h of the following undergoes nucleophilic su  | ıbstituti                        | on exclusively by $S_N^1$ mechnism?  |  |  |  |
|        | (A)                          | Chloroethane  | (B)                              | Isopropyl chloride   |  |  |  |
|        | (C)                          | Chlorobenzene   | (D)                              | Benzyl chloride  |  |  |  |
| 171    | The n                        | number of possible stereoisomers for CH <sub>2</sub> CH   | =CHC                             | H <sub>2</sub> CH(Br)CH <sub>2</sub> is:   |  |  |  |
| 1 / 1. | (A)                          | 8   | (B)                              | 2  |  |  |  |
|        | (C)                          | 4   | (D)                              | 6  |  |  |  |
| 172    | 2_Me                         | thoxy_2_methylpropage on heating with HI r  | roduce                           | ·c.  |  |  |  |
| 1/2.   | (A)                          | Methanol and sec-propyl iodide  | (B)                              | Methyl iodide and tert-butyl alcohol   |  |  |  |
|        | (C)                          | Methyl iodide and isobutene   | (D)                              | Methanol and tet-butyl iodide  |  |  |  |
| 172    | The L                        | aget acidic compound among the following i  |                                  |  |  |  |  |
| 175.   | $(\Delta)$                   | o-Nitrophenol   | s.<br>(B)                        | m-Nitrophenol  |  |  |  |
|        | $(\mathbf{C})$               | p-Nitrophenol   | (D)                              | Phenol   |  |  |  |
| 174    | (0)                          |   | (2)                              |  |  |  |  |
| 1/4.   | An al                        | kene $C_7H_{14}$ on reductive ozonolysis gives an vetone is:  | aldeny                           | when formula $C_3H_6O$ and a ketone.   |  |  |  |
|        | (A)                          | 2-Butanone  | (B)                              | 2-Pentanone  |  |  |  |
|        | (C)                          | 3-Pentanone   | (D)                              | Propanone  |  |  |  |

| 175. | The increasing order of the rate of addition of HCN to the compounds i) Formaldehyde i<br>Acetone iii) Acetophenone iv) benzophenone |   |  |
|------|--|---|--|
|      | (A) $i < iii < iii < iv$   | (B) $iv < ii < iii < i$                         |  |
|      | (C) $iv < iii < ii < i$  | (D) $iv < i < ii < iii$                         |  |
| 176. | The carboxylic acid that does not undergo Hell-V   | ohlard-Zelinsky reaction is:                    |  |
|      | (A) CH <sub>3</sub> COOH   | (B) $(CH_3)_2CHCOOH$                            |  |
|      | (C) $CH_3CH_2CH_2COOH$   | (D) $(CH_3)_3CCOOH$                             |  |
| 177. | $C_2H_5NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y \xrightarrow{NH_3}$<br>(excess)  | ► Z   |  |
|      | In the above sequence, Z is:   |   |  |
|      | (A) cyanoethane  | (B) ethanamide                                  |  |
|      | (C) methanamine  | (D) ethanamine                                  |  |
| 178. | The attachment of which of the following group a value?  | t para position in aniline will raise the $K_b$ |  |
|      | (A) $-SO_3H$   | (B) –OH   |  |
|      | (C) –F   | (D) –Br   |  |
| 179. | Which of the following is an example of globular   | protein?  |  |
|      | (A) myosin   | (B) collagen                                    |  |
|      | (C) keratin  | (D) haemoglobin                                 |  |
| 180. | Which one of the following is synthesized in our l   | body by sun rays?                               |  |
|      | (A) Vitamin D  | (B) Vitamin B                                   |  |
|      | (C) Vitamin K  | (D) Vitamin A                                   |  |
| 181. | Caprolactum is the is the starting material for the  | synthesis of                                    |  |
|      | (A) Nylon-6  | (B) Nylon6,6                                    |  |
|      | (C) Terylene   | (D) Nylon 10                                    |  |
| 182. | The species which can serve as an initiator for cat  | ionic polymerization is                         |  |
|      | (A) Lithium aluminium hydride  | (B) Nitric acid                                 |  |
|      | (C) Aluminium chloride   | (D) BuLi  |  |
| 183. | Aspirin is an:   |   |  |
|      | (A) analgesic  | (B) antipyretic                                 |  |
|      | (C) antimalarial   | (D) Both analgesic and antipyretic              |  |
| 184. | The equivalent mass of iron in the reaction 2Fe +  | $3Cl_2 \rightarrow 2FeCl_3$ is:                 |  |
|      | (A) Half of its atomic mass  | (B) One third of its atomic mass                |  |
|      | (C) Same as atomic mass  | (D) One fourth of its atomic mass               |  |
| 185. | Which of the following sets of quantum numbers   | is correct for an electron in 4f subshell?      |  |
|      | (A) $n=4, l=3, m=4, s=+1/2$  | (B) $n=4, l=3, m=-4, s=-1/2$                    |  |
|      | (C) $n=4, l=3, m=+1, s=+1/2$   | (D) $n=3$ , $l=2$ , $m=-2$ , $s=+1/2$           |  |
| 186  | The correct sequence of atomic radii is:   |   |  |
| 100. | (A) Na>Mg>Al>Si  | (B) Al>Si>Na>Mg                                 |  |
|      | (C) Si>Al>Mg>Na  | (D) Si>Al>Na>Mg                                 |  |
| 187  | In which of the following the bond angle around  | the central atom is maximum?                    |  |
| 107. | (A) NH <sub>3</sub>  | (B) $NH_{4}^{+}$                                |  |
|      | (C) PCl <sub>3</sub>   | (D) SCl <sub>2</sub>                            |  |

| 188. | Which of the following molecule does not exist |   |                          |   |
|------|--|---|--------------------------|---|
|      | (A)  | NF <sub>3</sub>   | (B)                      | NF <sub>5</sub>   |
|      | (C)  | PF <sub>5</sub>   | (D)                      | $N_2H_4$  |
| 189. | If heli  | um is allowed to expand in vacuum, it liberat   | es hea                   | t because   |
|      | (A)  | It is an inert gas  | (B)                      | It is an ideal gas  |
|      | (C)  | Its critical temp. is low   | (D)                      | It is a light gas   |
| 190. | i) H <sub>2</sub> (greaction                   | $g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ ii) $H_2(g) + ons$ ,  | 1/2O <sub>2</sub> (      | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two  |
|      | (A)  | $\mathbf{x} > \mathbf{y}$   | (B)                      | x < y   |
|      | (C)  | $\mathbf{x} = \mathbf{y}$   | (D)                      | $\mathbf{x} + \mathbf{y} = 0$   |
| 191. | If the l<br>respec                             | bond dissociation energies of XY, X <sub>2</sub> , Y <sub>2</sub> (all tively and $\Delta_{\rm f}$ H of XY is -200KJmol <sup>-1</sup> , the bor   | diator<br>d diss         | mic molecules) are in the ratio 1:1:0.5,<br>sociation energy of $X_2$ will be:  |
|      | $(\mathbf{A})$                                 | $200 \text{ K Imol}^{-1}$   | $(\mathbf{D})$           | $100 \text{ K Imol}^{-1}$   |
|      | (C)  | 200 KJIII0I   | (D)                      |   |
| 192. | What water what water among (A)                | will be the correct order of vapour pressure or<br>these compounds water has maximum boiling<br>Water <ether<ethanol< td=""><td>f wate<br/>ng poin<br/>(B)</td><td>r, ethanol and ether at 30<sup>o</sup>C? Given that<br/>nt and ether has minimum boiling point.<br/>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<> | f wate<br>ng poin<br>(B) | r, ethanol and ether at 30 <sup>o</sup> C? Given that<br>nt and ether has minimum boiling point.<br>Water <ethanol<ether< td=""></ethanol<ether<> |
|      | (C)  | Ether <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>  | (D)                      | Ethanol <ether<water< td=""></ether<water<>   |
| 193. | Which consta                                   | of the following will occur if a 0.1M solution nt temperature?  | n of a                   | weak acid is diluted to 0.01M at  |
|      | (A)  | $[H^+]$ will decrease to 0.001M   | (B)                      | pH will decrease  |
|      | (C)  | Percentage ionization will increase   | (D)                      | K <sub>a</sub> will increase  |
| 194. | Which  | of the following species involves the transfe   | r of 51                  | N <sub>A</sub> electrons per mole of it ?   |
|      | (A)  | $MnO_4^2 \rightarrow MnO_4^-$   | (B)                      | $MnO_4 \rightarrow Mn^{2+}$   |
|      | (C)  | $MnO_4 \rightarrow MnO_2$   | (D)                      | $CrO_4^2 \rightarrow Cr^{3+}$   |
| 195. | 30-vol   | ume hyderogen peroxide means:   |                          |   |
|      | (A)  | $30\% H_2O_2$ by volume   | (B)                      | $30g$ of $H_2O_2$ solution containing 1g of it  |
|      | (C)  | 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of O <sub>2</sub><br>gas at STP  | (D)                      | 30 cm <sup>3</sup> of the solution contains one mole of $H_2O_2$  |
| 196. | The co   | prrect sequence of covalent character is repres   | sented                   | by:   |
|      | (A)  | LiCl <nacl<becl<sub>2</nacl<becl<sub>   | (B)                      | BeCl <sub>2</sub> <licl<nacl< td=""></licl<nacl<>   |
|      | (C)  | NaCl <licl< becl<sub="">2</licl<>   | (D)                      | BeCl <sub>2</sub> <nacl< licl<="" td=""></nacl<>  |
| 197. | Which  | of the following is known as pyrene?  |                          |   |
|      | (A)  | CCl <sub>4</sub>  | (B)                      | $CS_2$  |
|      | (C)  | S <sub>2</sub> Cl <sub>2</sub>  | (D)                      | Solid CO <sub>2</sub>   |
| 198. | The m  | ost stable carbocation amongst the following  | is:                      |   |
|      | (A)  | $(CH_3)_2CH^+$  | (B)                      | $Ph_3C^+$   |
|      | (C)  | $CH_3CH_2^+$  | (D)                      | $CH_2 = CH - CH_2^+$  |
|      |  |   |                          |   |

- 199. The molecule that will have dipole moment is:
  - (A) 2,2-Dimethylpropane(C) Trans-2-Butene

- (B) Cis-2-Butene
- (D) 2,2,3,3-Tetramethylbutane
- 200. Of the five isomeric hexanes, the isomer which can give two monochlorinated compound is:
  - (A) 2-Methylpentane
  - (C) 2,3-Dimethylbutane

- (B) 2,2-Dimethylbutane
- (D) n-Hexane

| Sr.<br>No | Question   |   |
|-----------|--|---|
| 1.        | Which among the following crop has epigeal ge<br>(A) Sunflower<br>(C) Rice   | rmination?<br>(B) Chickpea<br>(D) Pearl millet  |
| 2.        | <ul><li>Which fraction of soil organic matter is soluble</li><li>(A) Humic acid</li><li>(C) Hymatomelonic acid</li></ul>                                 | in both alkali and acid:<br>(B) Fulvic acid<br>(D) Humin acid   |
| 3.        | <ul><li>Nitrogen use efficiency in rice can be increased</li><li>(A) Delayed application of N</li><li>(C) Application of S-coated urea</li></ul>         | <ul><li>by:</li><li>(B) Use of biofertilizers</li><li>(D) Application of blue green algae</li></ul>       |
| 4.        | <ul><li>Which stage of sugarcane is most critical for irri</li><li>(A) Germination</li><li>(C) Grand growth phase</li></ul>                              | igation?<br>(B) Formative stage<br>(D) Ripening stage   |
| 5.        | The largest producer of rapeseed-mustard in Ind  | ia is   |
|           | <ul><li>(A) Haryana</li><li>(C) Rajasthan</li></ul>  | <ul><li>(B) Uttar Pradesh</li><li>(D) Gujarat</li></ul>   |
| 6.        | <ul><li>The term Functional or Metabolic Nutrients was</li><li>(A) JV Leibig</li><li>(C) DI Arnon</li></ul>  | s proposed by:<br>(B) DJ Nicholas<br>(D) Mosanoba Fukuoka   |
| 7.        | <ul> <li>Botanical name of sunnhemp is</li> <li>(A) Sesbania aculeata</li> <li>(C) Carthamus tinctorium</li> </ul>                                       | <ul><li>(B) Trifolium alexandrinum</li><li>(D) Crotolaria juncea</li></ul>                                |
| 8.        | <ul> <li>The upper limit of soil moisture available for pla</li> <li>(A) PWP (15 bars)</li> <li>(C) Field capacity (1/3 bars)</li> </ul>                 | ant growth is:<br>(B) Hygroscopic coefficient<br>(D) Gravitational potential                              |
| 9.        | <ul><li>For which fertilizer, India is fully dependent on</li><li>(A) N fertilizers</li><li>(C) P fertilizers</li></ul>                                  | import?<br>(B) K fertilizers<br>(D) S fertilizers   |
| 10.       | <ul><li>Agrostology is the branch of Agronomy that dea</li><li>(A) Aromatic and medicinal crops</li><li>(C) Fodder crops</li></ul>                       | <ul><li>als with cultivation of:</li><li>(B) Non edible oilseeds</li><li>(D) Green manure crops</li></ul> |
| 11.       | <ul><li>With excessive use of nitrogen in sugarcane, the</li><li>(A) Increased</li><li>(C) Decreased</li></ul>   | <ul><li>e sugar content in juice is:</li><li>(B) Remains same</li><li>(D) Not affected</li></ul>          |
| 12.       | <ul> <li>Bacteria responsible for nitrogen fixation in soy</li> <li>(A) <i>Rhizobium leguminosarum</i></li> <li>(C) <i>Rhizobium phaseoli</i></li> </ul> | bean is<br>(B) Rhizobium japonicum<br>(D) Rhizobium trifoli   |

| 13. | The m<br>(A)<br>(C)           | nost critical stage of irrigation in maize is:<br>Silking stage<br>Grain development stage       | (B)<br>(D)                                       | Tasseling stage<br>Dough stage   |
|-----|-------------------------------|--|--|--|
| 14. | Nippi<br>(A)<br>(C)           | ng in chickpea is beneficial to:<br>Promote branching<br>Check excessive vegetative growth       | (B)<br>(D)                                       | Promote flowering<br>Improve seed setting                                |
| 15. | Quant<br>(A)<br>(C)           | tity of urea required by wheat for one acre<br>130<br>110  | e at a (<br>(B)<br>(D)                           | dose of 125 kg per hectare is:<br>90<br>275                              |
| 16. | Congr<br>(A)<br>(C)           | ress grass (Parthenium hysterophorus) ca<br>Chrysoperla<br>Zygogramma bicolorata                 | n be c<br>(B)<br>(D)                             | ontrolled by insect:<br>Dactylopius tomentosus<br>Bacillus thuringiensis |
| 17. | Applie<br>leads<br>(A)<br>(C) | cation of organic material with wider C:N<br>to:<br>N immobilization<br>Immediate release in N   | (B)<br>(D)                                       | (usually more than (20:1) to soil<br>N leaching<br>N mineralization      |
| 18. | Heavy<br>(A)<br>(C)           | y shedding of buds and bolls in cotton occ<br>Deficiency of N in soil<br>Deficiency of P in soil | curs d<br>(B)<br>(D)                             | ue to:<br>Water stress at bud formation stage<br>Excess of N is soil     |
| 19. | 'Whip<br>(A)<br>(C)           | tail' is brassica is due to the deficiency of<br>Calcium<br>Manganese                            | of:<br>(B)<br>(D)                                | Magnesium<br>Zinc  |
| 20. | Whicl<br>(A)<br>(C)           | h kind of soil mineralogy has the highest<br>Kaolinite<br>Montmorillonite                        | <ul><li>'catio</li><li>(B)</li><li>(D)</li></ul> | n exchange capacity':<br>Illite<br>Humus                                 |
| 21. | Optim<br>(A)<br>(C)           | num row spacing for fodder crops is:<br>30 cm<br>45 cm   | (B)<br>(D)                                       | 60 cm<br>75 cm   |
| 22. | The b<br>(A)<br>(C)           | alance sheet of a dairy farm represent:<br>Assets<br>Both (A) and (B)                            | (B)<br>(D)                                       | Liabilities<br>None of these   |
| 23. | Main<br>(A)<br>(C)            | limitation in keeping farm records in Indi<br>Illiteracy<br>Big size of holding                  | a is:<br>(B)<br>(D)                              | Nature of farming<br>None of these                                       |
| 24. | Profit<br>(A)<br>(C)          | and loss account is a type of:<br>Personal account<br>Nominal account                            | (B)<br>(D)                                       | Real account<br>None of these  |
| 25. | Which<br>(A)<br>(C)           | h is the most prominent book for keeping<br>Journal<br>Cash book                                 | farm<br>(B)<br>(D)                               | records and accounts:<br>Ledger<br>Purchase register                     |

| 26. | The list of all the physical property of a business along with their values at a specific point of time is known as: |   |                |                                    |  |
|-----|--|---|----------------|------------------------------------|--|
|     | (A)  | Assets  | (B)            | Liabilities                        |  |
|     | (C)  | Farm inventory  | (D)            | None of these                      |  |
| 27. | The c<br>know  | decline in value of assets due to usage, acc          | eident         | al damage and time obsolescence is |  |
|     | (A)  | Appreciation  | (B)            | Depreciation                       |  |
|     | (C)  | Interest  | (D)            | None of these                      |  |
| 28. | Whic   | th of the following is not a component of the         | farm l         | ousiness:                          |  |
|     | (A)  | Capital   | (B)            | Land                               |  |
|     | (C)  | Market  | (D)            | Labour and management              |  |
| 29  | Oueer  | n of Fruits is <sup>.</sup>                           |                |                                    |  |
| _>. | (A)  | Mango   | (B)            | Apple                              |  |
|     | (C)  | Litchi  | (D)            | Banana                             |  |
| 20  | Low  | abilling poors are trained by:                        |                |                                    |  |
| 30. | $(\Delta)$   | Espaliar system                                       | $(\mathbf{R})$ | Centre leader system               |  |
|     | $(\mathbf{C})$   | Modified leader system                                | (D)            | Y trellies system                  |  |
| 21  | (C)  |   | (2)            |                                    |  |
| 31. | Wind   | break established in the orchards is of:              |                |                                    |  |
|     | (A)  | Jamun   | (B)            | Jhatti Khatti                      |  |
|     | (C)  | Karonda   | (D)            | Galgal                             |  |
| 32. | Straw  | berry is propagated through:                          |                |                                    |  |
|     | (A)  | Stolon  | (B)            | Runners                            |  |
|     | (C)  | Crown   | (D)            | Suckers                            |  |
| 33. | Epico  | tyl grafting is commonly done in:                     |                |                                    |  |
|     | (Â)  | Guava   | (B)            | Litchi                             |  |
|     | (C)  | Pear  | (D)            | Mango                              |  |
| 34  | Daisv  | ris cross between                                     |                |                                    |  |
| 54. | (A)  | Fortune x Fremont mandarin                            | (B)            | King x Willow leaf                 |  |
|     | (C)  | Citrus grandis Osbeck × Citrus                        | (D)            | Sweet orange x <i>C</i> trifoliata |  |
|     |  | Paradisi Macf.  |                |                                    |  |
| 35. | Aruni  | ka is cross between:                                  |                |                                    |  |
|     | (A)  | Dashehari x Neelum                                    | (B)            | Neelum x Dashehari                 |  |
|     | (C)  | Amrapali x Vanraj                                     | (D)            | Sensation x Amrapali               |  |
| 36  | Phyto  | <i>phthora</i> is controlled with the application of: |                |                                    |  |
| 50. | (A)  | Ridomil   | (B)            | Bayleton                           |  |
|     | (C)  | c. M 45   | (D)            | All of these                       |  |
| 27  | V 11   |   |                |                                    |  |
| 51. | r ello   | w pigment in papaya fruit is:<br>Xanthophyll          | (D)            | Carotene                           |  |
|     | $(\mathbf{A})$   | I veonene   | $(\mathbf{D})$ | Caricaxanthin                      |  |
|     | $(\mathbf{C})$   | Lycopene  | (D)            | Сансаланини                        |  |

| 38. | Which<br>(A)<br>(C)  | h garden is also referred as 'Nature in Miniatu<br>Japanese<br>English                  | ure:<br>(B)<br>(D)    | Mughals<br>Persian   |
|-----|----------------------|---|-----------------------|--|
| 39. | Tree v<br>(A)<br>(C) | with drooping inflorescence is:<br>Jacaranda mimosaefolia<br>Bassia latifolia           | (B)<br>(D)            | Salyx baylonica<br>Kigelia pinnata                                     |
| 40. | Red s<br>(A)<br>(C)  | carlet is a cultivar of:<br>Radish<br>Onion   | (B)<br>(D)            | Carrot<br>Turnip   |
| 41. | Whic<br>(A)<br>(C)   | h of the following is a climacteric fruit?<br>Muskmelon<br>Both A and B                 | (B)<br>(D)            | Tomato<br>None of these  |
| 42. | Sun s<br>(A)<br>(C)  | calding incidence usually occurs in:<br>Brinjal<br>Muskmelon                            | (B)<br>(D)            | Tomato<br>Cauliflower  |
| 43. | Sex e<br>(A)<br>(C)  | expression in pointed gourd is:<br>Monoecious<br>Dioecious                              | (B)<br>(D)            | Andromonoecious<br>Hermaphrodite                                       |
| 44. | Whic<br>(A)          | h of the following soil is most suitable for<br>Sandy                                   | r vege<br>(B)         | stables?<br>Sandy Loam   |
|     | (C)                  | Clay loam   | (d)                   | Clay   |
| 45. | The s (A) (C)        | eed required for one hectare sowing of ca<br>1-2 kg<br>4-5 kg                           | rrot is<br>(B)<br>(D) | 5<br>10-15 kg<br>15-20 kg  |
| 46  | The n                | nain reason for blanching of fruits and vegetal   | hles is               |  |
| 10. | (A)<br>(C)           | To make them soft<br>To make the products taste better                                  | (B)<br>(D)            | To inactivate enzymes<br>For long term preservation of products        |
| 47. | What<br>(A)<br>(C)   | is Canning<br>Placing of foods in sealed metal<br>containers<br>Placing cans in retorts | (B)<br>(D)            | Storage of foods in hermetically sealed<br>containers<br>None of these |
| 48. | What<br>(A)<br>(C)   | is Brine<br>A solution of sugar and water<br>A solution of vinegar and water            | (B)<br>(D)            | A solution of salt and water<br>An additive used in food processing    |

| 49. | The most economical way of drying fruits and vegetables is |  |                            |  |  |
|-----|--|--|----------------------------|--|--|
|     | (A)  | Solar drying   | (B)                        | Oven drying  |  |
|     | (C)  | Mechanical drying  | (D)                        | None of these  |  |
| 50. | Prese  | ervative used in tomato Ketchup is   |                            |  |  |
|     | (A)  | Potassium Metabisulphite   | (B)                        | Sodium Benzoate  |  |
|     | (C)  | Citric acid  | (D)                        | None of these  |  |
| 51. | While  | e walking on smooth surface one should take  | small                      | steps to ensure  |  |
|     | (A)  | Large friction   | (B)                        | Small friction   |  |
|     | (C)  | Larger normal force  | (D)                        | Smaller normal force   |  |
| 52. | What<br>and ti   | happens to a vehicle travelling in an unbank ires suddenly disappears  | ed curv                    | ved path if the friction between the road  |  |
|     | (A)  | Moves along tangent  | (B)                        | Moves radially in  |  |
|     | (C)  | Moves radially out   | (D)                        | Moves along the curve  |  |
| 53. | A bal<br>chang<br>(A)                                      | Il of mass 0.2 kg strikes an obstacle and move<br>ges from 20m/s to 10m/s the magnitude of im<br>$2\sqrt{7}$ | es at 60<br>pulse 1<br>(B) | $2^{0}$ to its initial direction. If its speed received by the ball isNs $2\sqrt{3}$ |  |
|     | (C)  | 2√5  | (D)                        | $3\sqrt{2}$  |  |
| 54. | A spa<br>of ma   | accecraft of mass 2000kg moving with 600 m/<br>ass 500 kg is stationary. The velocity of other               | s sudde<br>part ir         | enly explodes into two pieces. One piece n m/s is                                    |  |
|     | (A)  | 600  | (B)                        | 800  |  |
|     | (C)  | 1500   | (D)                        | 1000   |  |
| 55. |  |  |                            |  |  |
|     | 16   | 5 kg 8 kg 4 kg ◀ 140 N The   | force of                   | on 16 kg is?   |  |
|     | (A)  | 140N   | (B)                        | 120N   |  |
|     | (C)  | 100N   | (D)                        | 80N  |  |
| 50  | (0)  |  |                            |  |  |

56. A man of mass 40 kg is at rest between the walls. If coeff. of friction between man and wall is 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



|     | h   |   |
|-----|---|---|
|     | Find minimum height in terms of D to comple   | ete the loop  |
|     | (A) 7D/4<br>(C) 5D/4  | <ul><li>(B) 9D/4</li><li>(D) 3D/4</li></ul>   |
| 58. | <ul> <li>Gravitational force between two bodies is F. T liquid of specific gravity 3. The gravitational f (A) F/9</li> <li>(C) F</li> </ul>   | The space around the mass is now filled with a<br>force will be<br>(B) 3F<br>(D) F/3  |
| 59. | <ul><li>A man weighs 75 kg on the surface of earth. H</li><li>(A) infinity</li><li>(C) zero</li></ul>   | His weight on the geostationary satellite is<br>(B) 150kg<br>(D) 75/2 kg  |
| 60. | g at a depth of 1600 km inside the earth in m/<br>(A) 6.65<br>(C) 8.65  | /s/s is<br>(B) 7.35<br>(D) 4.35   |
| 61. | A block of mass 19 M is suspended by a string<br>embedded in it. If the block completes the ver<br>(A) 140<br>(C) $20\sqrt{9.8}$  | g of length 1m. A bullet of mass M hits it and gets<br>retical circle the velocity of bullet in m/s is<br>(B) $20\sqrt{19.6}$<br>(D) $20$ |
| 62. | <ul> <li>A rubber ball falls from a height of 4m and relimpact is</li> <li>(A) 20</li> <li>(C) 23</li> </ul>  | bounds to 1.5m. The % loss of energy during the<br>(B) 62.5<br>(D) 60   |
| 63. | <ul> <li>25 kg of sand is deposited each second on a correquired to maintain the belt in motion is</li> <li>(A) 2600W</li> <li>(C) 325W</li> </ul>  | onveyor belt moving at 10m/s. The extra power<br>(B) 250W<br>(D) 2500W  |
| 64. | A uniform rod of mass M and length L standir<br>slipping at the bottom. The moment of inertia<br>(A) ML <sup>2</sup> /3<br>(C) ML <sup>2</sup> /9   | ng vertically on a horizontal floor falls without<br>will be<br>(B) $ML^2/6$<br>(D) $ML^2/12$   |
| 65. | If the velocity of C.M of a rolling body is V, the second | then velocity of highest point in the body will be<br>(B) V<br>(D) $V/\sqrt{2}$   |

57.

| 66. | The an of the            | ngular momentum of two rotating bodies are ir rotational K.E is   | equal.                     | If the ratio of their M.I is 1:4, the ratio   |
|-----|--------------------------|---|----------------------------|---|
|     | (A)                      | 1:2   | (B)                        | 2:1   |
| 67. | (C)<br>The le            | Evel of water in a tank is 5m. A hole $1 \text{ cm}^2$ is   | (D)<br>made                | 4:1 at the bottom. The rate of leakage in $m^3$   |
|     | /s is (t<br>(A)          | ake $g = 10 \text{ m/s/s}$ )<br>$10^{-3}$   | (B)                        | 10 <sup>-4</sup>  |
| 68. | (C)<br>Two b             | 10<br>locks A and B float in water. A floats with 1.  | (D)<br>/4 <sup>th</sup> of | $10^{-2}$ its volume immersed and B floats with   |
|     | $3/5^{\text{th}}$ c      | of its volume immersed. The ratio of their den  | (B)                        | is<br>12.5  |
|     | $(\mathbf{C})$           | 3:20  | (D)<br>(D)                 | 20:3  |
| 69. | The te<br>liquid         | erminal velocity of a spherical ball of lead of varies with R such that   | radius                     | R is V while falling through a viscous  |
|     | (A)<br>(C)               | V/R is constant<br>V is constant  | (B)<br>(D)                 | VR is constant $V/R^2$ is constant  |
| 70. | A hyd                    | raulic press uses a piston of 100 cm <sup>2</sup> to exert a piston that supports a mass of 2000 kg is (tak                       | a force                    | e of $10^7$ dynes on water. The area of the $10m/s/s$                                       |
|     | (A)                      | 100cm <sup>2</sup>  | (B)                        | $10^9 \text{ cm}^2$   |
|     | (C)                      | $2 \text{ x } 10^4 \text{ cm}^2$  | (D)                        | $2 \times 10^{10} \text{ cm}^2$   |
| 71. | When<br>throug<br>The ve | kerosene and coconut oil of coeff. of viscosi<br>gh the same pipe, under same pressure differe<br>olume of kerosene that flows is | ty 0.00                    | 02 and 0.0154 Ns/m <sup>2</sup> are followed<br>ad same time collects 1 lit of coconut oil. |
|     | (A)<br>(C)               | 5.5 lit<br>7.7 lit  | (B)<br>(D)                 | 6.6 lit<br>8.8 lit  |
| 72. | There                    | is a circular hole in metal plate. When the plate   | ate is l                   | neated the radius of the hole becomes   |
|     | (A)<br>(C)               | increased<br>unchanged  | (B)<br>(D)                 | decreased depends on metal  |
| 73. | Specit                   | fic heat of a substance depends on 1. Nature of the substance   | of subs                    | stance. 2. Mass of substance. 3. Heat   |
|     | (A)                      | Only one is correct   | (B)                        | Both 1 and 2 are correct  |
|     | (C)                      | All are correct   | (D)                        | Only 1 and 3 are correct  |
| 74. | In a gi                  | ive process dW=0, dq is <0 then for a gas<br>Temperature increases  | (B)                        | Volume decreases  |
|     | (C)                      | Pressure increases  | (D)                        | Pressure decreases  |
| 75. | The et                   | fficiency of carnot engine depends on   |                            |   |
|     | (A)<br>(C)               | Source temperature  | (B)<br>(D)                 | Both B and C  |
| 76. | A 200<br>with e          | turn coil of self inductance 30 mH carries a cach turn of coil  | curren                     | t of 5 mA. Find the magnetic flux linked  |
|     | (A)                      | $7.5 \times 10^{-7} \text{Wb}$  | (B)                        | $1.6 \times 10^{-7} \text{Wb}$  |
| 77  | (C)<br>The in            | 3 x 10 Wb   | (D)                        | $1.5 \times 10^{-7} \text{Wb}$  |
| //. | time t                   | he current will be maximum?   | 151 =                      | $2 \sin(100 \pi t + \pi/3)$ A. At what first  |
|     | (A)                      | 1/100 s<br>1/500 s  | (B)                        | 1/200 s   |
|     | $(\mathbf{C})$           | 1/300 5   | (D)                        | 1.5   |

What in electric system represents force in mechanical system ? 78.

| (A) | L   | (B) | Ι |  |
|-----|-----|-----|---|--|
| (C) | 1/C | (D) | 0 |  |

- A capacitor of 1 µF is charged with 0.01C of electricity. How much energy is stored in it? 79.
  - (A) 30 J (B) 40 J
  - 50 J (D) 60 J (C)

An electromagnetic wave is travelling in vacuum with a speed of 3 x  $10^8$  m/s. Find the velocity in 80. a medium having relative electric and magnetic permeability 2 and 1, respectively. (A)  $3/\sqrt{2} \times 10^8 \text{m/s}$ (B)  $1.5 \times 10^8 \text{m/s}$ (D) No change

- $2 \times 10^8 \text{m/s}$ (C)
- Trace the path of ray of light passing through a glass prism as shown in the figure. If the 81. refractive index of glass is  $\sqrt{3}$ , find out the value of angle of emergence from prism.



| (A) | 30 | (B) | 45 |
|-----|----|-----|----|
| (C) | 60 | (D) | 75 |

- Light wave from two coherent sources of intensities in ratio 64:1 produces interference. Calculate 82. the ration of maximum and minima of the interference pattern.
  - (A) 8:1 (B) 64:1 9:7 (D) 81:49 (C)
- In young's experiment, the width of the fringes obtained with light of wavelength 6000 A° is 2 83. mm. What will be the fringe width, if the entire apparatus is immersed in a liquid of refractive index 1.33?

| (A) | 1 mm | (B) | 1.5 mm |
|-----|------|-----|--------|
| (C) | 2 mm | (D) | 2.5 mm |

84. Unpolarised light is incident on plane glass surface. What should be the angle of incidence in degrees, so that the reflected and refracted rays are perpendicular to each other?

| (A) | 37 | (B) | 47 |
|-----|----|-----|----|
| (C) | 57 | (D) | 67 |

Determine the de-Broglie wavelength associated with an electron, accelerated through a potential 85. difference of 100 V.

| (A) | 1.227A° | (B) | 12.27A° |
|-----|---------|-----|---------|
| (C) | 122.7A° | (D) | 1227A°  |

## 86. A particle with rest mass m<sub>0</sub> is moving with velocity c. What is the de-Broglie wavelength associated with it?

| (A) | infinity   | (B) | zero  |
|-----|------------|-----|-------|
| (C) | radio wave | (D) | X ray |

87.

Which among the following series gives visible light? Lyman (B) Balmer (A)

Bracket (D) None of these (C)

88. Identify the logic operation performed by this circuit



- The number of silicon atoms per m<sup>3</sup> is  $5 \ge 10^{28}$ . This is doped simultaneously with  $5 \ge 10^{22}$  atoms per m<sup>3</sup> of arsenic and  $5 \ge 10^{20}$  atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that 89.  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ . ... .  $4.54 \times 10^9 \text{m}^{-3}$ (A)
  - $1.5 \ge 10^{16} \text{m}^{-3}$ (C)

| (B) | $4.95 \text{ x } 10^{22} \text{m}^{-3}$ |
|-----|---|
| (D) | $5 \ge 10^{28} \text{m}^{-3}$           |

- Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre 90. on the positive charge side along the axial line.
  - $4.5 \times 10^5 \text{N/C}$ (B)  $4.5 \times 10^5 \text{NC}$ (A) 4.5 x 10<sup>-5</sup>N/C (D)  $4.5 \times 10^{-5} \text{NC}$ (C)
- If the Gaussian surface is so chosen that there are some charges inside and some outside than the 91. electric field is due to
  - Only inside charges (B) Only outside charges (A)
  - (C) All the charges

r

- Cannot determine (D)
- 92. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R





93. Net capacitance of 3 identical capacitor in series is 1  $\mu$ F. What is the net capacitance in  $\mu$ F if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

94. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

95. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

96.

(A)

(C)



97. Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find the midpoint of the axis between them if same current I flows through both loops.

| (A) | $\mu_0 I/2^{3/2} r$ | (B) | $\mu_0 2 I/2^{3/2} r$ |
|-----|---------------------|-----|-----------------------|
| (C) | $\mu_0 I/4\pi r$    | (D) | Cannot be determined  |

98. A block of mass 4 kg is kept on a rough horizontal surface. The coefficient of static friction is 0.8. If a force of 19 N is applied on the block parallel to the floor, then the force of friction between the block and floor is:

| (A) | 19N | (B) | 18 N |
|-----|-----|-----|------|
| (C) | 16N | (D) | 9.8N |

99. Current in a circuit falls steadily from 2A to 0A in 10 ms. Calculate L if emf induced is 200V.

| (A)          | 1H | (B)          | 2H |
|--------------|----|--------------|----|
| <pre>/</pre> |    | ( <b>—</b> ) |    |

(C) 3H (D) 4H

100. Self inductance of the air core inductor increases from 0.01 mH to 10 mH on introducing an iron core. What is the relative permeability of the core used?

- (A)500(B)800(C)900(D)1000
- 101. Among the following, the most stable complex is (A)  $[Fe (H_2O)_6]^{3+}$  (B)  $[Fe (NH_3)_6]^{3+}$ (C)  $[Fe (C_2O_4)_3]^{3-}$  (D)  $[Fe (Cl)_6]^{3-}$
- 102. Which is the correct coordination number (C.N) and oxidation number (O.N) of the transition metal atom in  $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?
  - (A)C.N=3, O.N=+1(B)C.N=4, O.N=+2(C)C.N=6, O.N=+1(D)C.N=6, O.N=+3
- 103. In a solid, oxide ions are arranged in ccp, cations A occupy one sixth of the tetrahedral voids and cation B occupy one third of the octahedral voids. The formula of the solid is:
  (A) ABO<sub>3</sub>
  (B) A<sub>3</sub>BO
  - $\begin{array}{ll} (A) & ABO_3 \\ (C) & AB_3O \end{array}$ 
    - (D)  $A_3B_3O_3$
- 104. On mixing acetone to methanol some of the hydrogen bonds between methanol molecules break. Which of the following statements is correct about the above process?
  - (A) At specific composition methanol acetone mixture will form minimum boiling azeotrope and show positive deviation from Raoult's law
  - (C) At specific composition methanole acetone mixture will form minimum boiling azeotrope and show negative deviation from Raoult's law
- (B) At specific composition methanol acetone mixture will form maximum boiling azeotrope and show positive deviation from Raoult's law
- (D) At specific composition methanole acetone mixture will form maximum boiling azeotrope and show negative deviation from Raoult's law
- 105.  $K_{\rm H}$  value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10<sup>-5</sup> and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is:
  - (A) formaldehyde<methane<carbon dioxide<argon</li>
     (B) formaldehyde< carbon dioxide</li>
     <methane<argon</li>
     (D) argon <methane <carbon dioxide</li>
     <methane< formaldehyde</li>
- 106. The number of faradays of electricity required for electrolytic conversion of the mole of nitrobenzene to aniline is:
  - (A) 3F (B) 4F (C) 6F (D) 5F
- 107. The positive value of the standard electrode potential of  $Ag^+/Ag$  indicates that:
  - $\begin{array}{ccc} (A) & \mbox{This redox couple is a stronger reducing} & (B) & \mbox{This redox couple is a stronger} \\ & \mbox{agent than $H^+/H_2$ couple} & & \mbox{oxidizing agent than $H^+/H_2$ couple} \end{array}$

|  | (C) Ag can displace $H_2$ from acid   | (D)  | Ag can displace H <sub>2</sub> from base   |
|--|---|--|--|
| 108.   | .08. Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The de reaction rate is due to:   |  |  |
|  | <ul> <li>(A) A decrease in surface area</li> <li>(C) A decrease in the fraction of particles possessing sufficient energy</li> </ul>  | (B)<br>(D)                                       | A decrease in $\triangle$ H for the reaction<br>The introduction of an alternative<br>pathway with greater activation<br>energy. |
| 109.   | <ul> <li>Which of the following statements is not correct?</li> <li>(A) The rate of a reaction decreases with passage of time as concentration of reactants decrease</li> </ul>   | (B)  | The instantaneous rate a reaction is same at any time during the reaction  |
|  | (C) For a zero order reaction the<br>concentration of reactants remains<br>changed with passage of time   | (D)  | The rate of a reaction decreases with increase in concentration of reactant (s)  |
| 110. Which of the following gases shows the lowest adsorption per gram of char |   |  | n per gram of charcoal? The critical   |
|  | (A) $H_2$ (33K)<br>(C) $SO_2$ (630K)  | (B)<br>(D)                                       | CH <sub>4</sub> (190K)<br>CO <sub>2</sub> (304K)   |
| 111.   | <ul> <li>Freundlich adsorption isotherm is given by the exp statements are false?</li> <li>i. When 1/n=0, the adsorption is indeper ii. When n=0, the plot of x/m vs p graph iii. When 1/n=0, the adsorption is directly iv. When n=0, plot of x/m vs p is a curve (A) i and ii</li> </ul>  | oressio<br>ndent c<br>is a lin<br>y propc<br>(B) | n x/m=kp <sup>1/n</sup> . Which of the following<br>of pressure.<br>he parallel to x axis.<br>ortional to pressure.<br>ii and iv |
|  | (C) i and iii   | (D)  | all are false  |
| 112.   | In the extraction of chlorine by electrolysis of an a<br>the following statements are true?<br>i. $\triangle G^0$ for the overall reaction is positiviti.<br>ii. $\triangle G^0$ for the overall reaction is negativiti.<br>iii. $E^0$ for the overall reaction is positive<br>iv. $E^0$ for the overall reaction is negative<br>(A) i and iv | queou:<br>ve<br>ve<br>(B)                        | s solution of sodium chloride, which of  |
|  | (C) ii and iii  | (D)  | iii and iv   |
| 113.   | Which of the following pairs of ions are isoelectro<br>(A) $NO_2^+$ and $NO_3^-$<br>(C) $XeO_3^{2-}$ and $PCl_3$  | nic and<br>(B)<br>(D)                            | d isostructural ?<br>$ClO_3^-$ and $ICl_4^-$<br>$ClO_3^-$ and $SO_3^{2-}$  |
| 114.   | <ul> <li>Which of the following hydrides is the strongest re</li> <li>(A) NH<sub>3</sub></li> <li>(C) AsH<sub>3</sub></li> </ul>  | educing<br>(B)<br>(D)                            | g agent?<br>PH <sub>3</sub><br>SbH <sub>3</sub>  |
| 115.   | Consider the reactions,   |  |  |

 $\frac{\text{Zn + Conc. HNO_3 (hot)}}{12 + C \land D} = \frac{\text{Zn (NO_3)}_2 + \text{X} + \text{H}_2\text{O}}{12 + C \land D}$ i.
|      | ii.                    | $Zn + dil. HNO_3 (cold)$   | $Zn (NO_3)_2$  | $+ Y + H_2O$  |
|------|------------------------|--|--|---|
|      | (A)                    | N <sub>2</sub> O, NO   | (B)  | NO <sub>2</sub> , NO <sub>2</sub>   |
|      | (C)                    | $N_2, N_2O$  | (D)  | NO <sub>2</sub> , NO  |
| 116. | When<br>manga          | KMnO <sub>4</sub> acts as an oxidizing anese decreases by:                                     | agent in weakly alkal  | ine medium, the oxidation number of   |
|      | (A)                    | 1  | (B)  | 2   |
|      | (C)                    | 3  | (D)  | 5   |
| 117. | Acidi:<br>forma        | fied potassium dichromate sol  | ution turns green whe  | en $Na_2SO_3$ is added to it due to the   |
|      | (A)                    | CrSO <sub>4</sub>  | (B)  | $Cr_2(SO_4)_3$  |
|      | (C)                    | $\operatorname{CrO_4^{2-}}$  | (D)  | $Cr_2(SO_3)_3$  |
| 118. | The d<br>Whicl<br>numb | -electron configurations of Cr<br>h one of the following comple<br>ers of Cr=24, Mn=25, Fe=26, | <sup>2+</sup> , Mn <sup>2+</sup> , Fe <sup>2+</sup> and Co<br>xes will exhibit minin<br>Co=27) | <sup>2+</sup> are d <sup>4</sup> , d <sup>5</sup> , d <sup>6</sup> and d <sup>7</sup> , respectively.<br>num paramagnetic behavior? (atomic |
|      | (A)                    | $[Cr(H_2O)_6]^{2+}$  | (B)  | $[Mn(H_2O)_6]^{2+}$   |
|      | (C)                    | $[Fe(H_2O)_6]^2$   | (D)  | $[Co(H_2O)_6]^2$  |
| 119. | When                   | 2-Bromopentane is heated w   | ith potassium ethoxid  | e in ethanol, the major product obtained  |
|      | (A)                    | 2-Ethoxypentane  | (B)  | Pent-1-ene  |
|      | (C)                    | Cis-Pent-2-ene   | (D)  | Trans-Pent-2-ene  |
| 120. | Which                  | h of the following undergoes   | nucleophilic substituti  | on exclusively by $S_N^{1}$ mechnism?   |
|      | (A)<br>(C)             | Chloroethane   | (B)<br>(D)   | Isopropyl chloride<br>Benzyl chloride   |
| 121  | The n                  | umber of possible stereoisom   | ers for CH <sub>2</sub> CH=CHC   | H <sub>2</sub> CH(Br)CH <sub>2</sub> is:  |
| 121. | (A)                    | 8  | (B)  | 2   |
|      | (C)                    | 4  | (D)  | 6   |
| 122. | 2-Met                  | hoxy-2-methylpropane on he   | ating with HI produce  | S:  |
|      | (A)<br>(C)             | Methyl iodide and isobutene  | (D)  | Methanol and tet-butyl iodide   |
| 123. | The le                 | east acidic compound among t   | he following is:   | -   |
|      | (A)                    | o-Nitrophenol  | (B)  | m-Nitrophenol   |
|      | (C)                    | p-Nitrophenol  | (D)  | Phenol  |
| 124. | An all                 | kene $C_7H_{14}$ on reductive ozon   | olysis gives an aldehy   | de with formula $C_3H_6O$ and a ketone.   |
|      | (A)                    | 2-Butanone   | (B)  | 2-Pentanone   |
|      | (C)                    | 3-Pentanone  | (D)  | Propanone   |
| 125. | The ir<br>Aceto        | ncreasing order of the rate of a<br>ne iii) Acetophenone iv) benz                              | addition of HCN to the sophenone   | e compounds i) Formaldehyde ii)   |
|      | (A)                    | 1<11 < 111< 1V   | (B)<br>(D)   | 1V < 11 < 111 < 1   |
| 126  | The e                  | IV MIN IN I  | (D)<br>Adarga Hall Vahlard   | Zalinsky reaction is:   |
| 120. | (A)                    | CH <sub>3</sub> COOH   | (B)  | (CH <sub>3</sub> ) <sub>2</sub> CHCOOH  |
|      | (C)                    | CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH   | (D)  | (CH <sub>3</sub> ) <sub>3</sub> CCOOH   |
|      |                        |  |  |   |

| 127. | NaNO <sub>2</sub> /HCl P/Br <sub>2</sub> NH <sub>3</sub>                    | 7   |                         |
|------|---|---|-------------------------|
|      | $C_2H_5NH_2 \longrightarrow X \longrightarrow Y \longrightarrow$ (excess)   | L   |                         |
|      | In the above sequence, Z is:  |   |                         |
|      | <ul><li>(A) cyanoethane</li><li>(C) methanamine</li></ul>                   | <ul><li>(B) ethanamide</li><li>(D) ethanamine</li></ul> |                         |
| 128. | The attachment of which of the following group at                           | para position in aniline will r                         | aise the K <sub>b</sub> |
|      | value? $(A) = SO_2H$  | (B) –OH   |                         |
|      | $\begin{array}{ccc} (A) & & 503H \\ (C) & -F \end{array}$                   | (D) $-Br$   |                         |
| 129. | Which of the following is an example of globular p                          | otein?  |                         |
|      | (A) myosin  | (B) collagen  |                         |
|      | (C) keratin   | (D) Haemoglobin   |                         |
| 130. | Which one of the following is synthesized in our b                          | dv bv sun ravs?   |                         |
|      | (A) Vitamin D   | (B) Vitamin B   |                         |
|      | (C) Vitamin K   | (D) Vitamin A   |                         |
| 131. | Caprolactum is the is the starting material for the s                       | nthesis of  |                         |
|      | (A) Nylon-6   | (B) Nylon6,6  |                         |
|      | (C) Terylene  | (D) Nylon 10  |                         |
| 132. | The species which can serve as an initiator for cati                        | nic polymerization is                                   |                         |
|      | (A) Lithium aluminium hydride   | (B) Nitric acid   |                         |
|      |   | (D) Bull  |                         |
| 133. | Aspirin is an:<br>(A) $analogoida$  | (D) antinuratia   |                         |
|      | (C) antimalarial  | (D) Both analgesic and an                               | tipvretic               |
| 134  | The equivalent mass of iron in the reaction $2Fe + 3$                       | $C_{l_{a}} \rightarrow 2FeC_{l_{a}}$ is:                | I J                     |
| 151. | (A) Half of its atomic mass   | (B) One third of its atomi                              | c mass                  |
|      | (C) Same as atomic mass   | (D) One fourth of its atom                              | nic mass                |
| 135. | Which of the following sets of quantum numbers is                           | correct for an electron in 4f                           | subshell?               |
|      | (A) $n=4, l=3, m=4, s=+1/2$   | (B) $n=4, l=3, m=-4, s=-1$                              | /2                      |
|      | (C) $n=4, l=3, m=+1, s=+1/2$  | (D) $n=3, l=2, m=-2, s=+1$                              | ./2                     |
| 136. | The correct sequence of atomic radii is:                                    |   |                         |
|      | (A) Na>Mg>Al>Si<br>(C) Si>Al>Ma>Na  | (B) $Al > Si > Na > Mg$                                 |                         |
|      | (C) SI-AI-Mg-Na   | (D) SI-AI-INA-Mg  |                         |
| 137. | In which of the following, the bond angle around the $(A)$ NH               | e central atom is maximum?<br>(B) NH $^+$               |                         |
|      | $\begin{array}{c} (A) & NII_3 \\ (C) & PCl_3 \end{array}$                   | (D) $SCl_2$   |                         |
| 120  | Which of the following molecule does not exist                              | (2) 2012  |                         |
| 130. | (A) $NF_2$  | (B) $NF_5$  |                         |
|      | (C) $PF_5$  | (D) $N_2H_4$  |                         |
| 139. | If helium is allowed to expand in vacuum, it libera                         | es heat because   |                         |
|      | (A) It is an inert gas  | (B) It is an ideal gas                                  |                         |
|      | (C) Its critical temp. is low   | (D) It is a light gas                                   |                         |
| 140. | i) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(I) + x \text{ KJ}$ ii) $H_2(g) + i$ | $/2O_2(g) \rightarrow H_2O(g) + y \text{ KJ};$          | For the given two       |
|      | <b>14  </b> P C A [   |   |                         |

reactions.

- $(A) \quad x > y \qquad (B) \quad x < y$
- (C) x = y (D) x + y = 0

141. If the bond dissociation energies of XY,  $X_2$ ,  $Y_2$  (all diatomic molecules) are in the ratio 1:1:0.5, respectively and  $\Delta_t H$  of XY is -200KJmol<sup>-1</sup>, the bond dissociation energy of  $X_2$  will be:

(A)  $400 \text{ KJmol}^{-1}$ 

- (B)  $300 \text{ KJmol}^{-1}$
- (C)  $200 \text{ KJmol}^{-1}$  (D)  $100 \text{ KJmol}^{-1}$

What will be the correct order of vapour pressure of water, ethanol and ether at  $30^{\circ}$ C? Given that 142. among these compounds water has maximum boiling point and ether has minimum boiling point. (A) Water<ether<ethanol **(B)** Water<ethanol<ether (C) Ether<ethanol<water (D) Ethanol<ether<water 143. Which of the following will occur if a 0.1M solution of a weak acid is diluted to 0.01M at constant temperature? (A) [H<sup>+</sup>] will decrease to 0.001M (B) pH will decrease (D) (C) Percentage ionization will increase K<sub>a</sub> will increase Which of the following species involves the transfer of 5N<sub>A</sub> electrons per mole of it ? 144.  $MnO_4^{2-} \rightarrow MnO_4^{--}$ (B)  $MnO_4^- \rightarrow Mn^{2+}$ (A) (D)  $CrO_4^{2-} \rightarrow Cr^{3+}$  $MnO_4^- \rightarrow MnO_2$ (C) 145. 30-volume hyderogen peroxide means: (B) 30% H<sub>2</sub>O<sub>2</sub> by volume 30g of H<sub>2</sub>O<sub>2</sub> solution containing 1g of (A) it  $30 \text{ cm}^3$  of the solution contains one 1 cm<sup>3</sup> of solution liberates 30 cm<sup>3</sup> of  $O_2$ (C) (D) gas at STP mole of  $H_2O_2$ 146. The correct sequence of covalent character is represented by: LiCl<NaCl<BeCl<sub>2</sub> BeCl<sub>2</sub><LiCl<NaCl (A) **(B)** NaCl<LiCl< BeCl<sub>2</sub> BeCl<sub>2</sub><NaCl<LiCl (C) (D) 147. Which of the following is known as pyrene? (A)  $CCl_4$ (B)  $CS_2$ (C)  $S_2Cl_2$ Solid CO<sub>2</sub> (D) 148. The most stable carbocation amongst the following is:  $Ph_3C^+$  $(CH_3)_2CH^+$ (A) **(B)** (C)  $CH_3CH_2^+$ (D)  $CH_2 = CH - CH_2^+$ 149. The molecule that will have dipole moment is: (A) 2,2-Dimethylpropane Cis-2-Butene **(B)** 2,2,3,3-Tetramethylbutane (C) Trans-2-Butene (D) 150. Of the five isomeric hexanes, the isomer which can give two monochlorinated compound is: (A) 2-Methylpentane **(B)** 2.2-Dimethylbutane 2.3-Dimethylbutane (C) (D) n-Hexane 151. Crossing over occurs in meiosis I during: Metaphase (A) (B) Telophase

(C) Anaphahse (D) Pachytene

| 152. | <ul><li>Power house of the cell:</li><li>(A) Golgi body</li><li>(C) Mitochondria</li></ul>  | <ul><li>(B) Ribosomes</li><li>(D) Lysosomes</li></ul>  |
|------|---|--|
| 153. | <ul><li>Genetics is the study of:</li><li>(A) Heredity</li><li>(C) Both A and B</li></ul>   | <ul><li>(B) Variation</li><li>(D) None of these</li></ul>  |
| 154. | <ul><li>In sex -linked inheritance, characters are passe</li><li>(A) Daughter</li><li>(C) Both daughter and son</li></ul>         | ed from father to the grandsons through his:<br>(B) Son<br>(D) Any of them                           |
| 155. | <ul><li>Which of the following bases is not present in</li><li>(A) Uracil</li><li>(C) Adenine</li></ul>                           | RNA:<br>(B) Thymine<br>(D) Cytosine  |
| 156. | <ul><li>Mendel's principle of independent assortment</li><li>(A) Monohybrid cross</li><li>(C) Both A and B</li></ul>              | <ul><li>can be demonstrated through:</li><li>(B) Dihybrid cross</li><li>(D) Any of them</li></ul>    |
| 157. | <ul> <li>On hydrolysis, maltose gives</li> <li>(A) glucose + glucose</li> <li>(C) glucose + fructose</li> </ul>                   | <ul><li>(B) glucose + lactose</li><li>(D) glucose + galactose</li></ul>                              |
| 158. | <ul><li>A dipeptide has peptide bonds.</li><li>(A) Three</li><li>(C) Two</li></ul>  | <ul><li>(B) One</li><li>(D) None of them</li></ul>   |
| 159. | <ul><li>Which vitamin can be synthesized by green pl but not by mammals?</li><li>(A) Ascorbic acid</li><li>(C) Thiamine</li></ul> | <ul><li>ants and various micro-oraganisms</li><li>(B) Pantothenic acid</li><li>(D) Retinol</li></ul> |
| 160. | <ul><li>Bacterial cell wall is made up of:</li><li>(A) Chitin</li><li>(C) Peptidoglycan</li></ul>                                 | <ul><li>(B) Cellulose</li><li>(D) All the above</li></ul>  |
| 161. | <ul><li>Plant viruses are generally of:</li><li>(A) RNA</li><li>(C) mRNA</li></ul>  | <ul><li>(B) DNA</li><li>(D) tRNA</li></ul>   |

<sup>162.</sup> Gram positive aerobic, filamentous bacteria with hyphae are known as:(A) Algae(B) Actinomycetes

|      | (C)                              | Bacteria  | (D)                   | Fungi   |
|------|----------------------------------|---|-----------------------|---|
| 163. | Conv<br>(A)<br>(C)               | rersion of organic matter in to simple inor<br>Immobilization<br>Co <sub>2</sub> fixation | ganic<br>(B)<br>(D)   | forms is called:<br>Mineralization<br>Nitrification |
| 164. | Exces<br>(A)<br>(C)              | ss carbon (> C/N ratio) leads to rate of de<br>Slow<br>Optimum                            | compo<br>(B)<br>(D)   | osition:<br>Fast<br>None                            |
| 165. | N <sub>2</sub> fix<br>(A)<br>(C) | xing cells of cyanobacteria are known as:<br>Cyst<br>Spores                               | (B)<br>(D)            | Akinetes<br>Heterocyst                              |
| 166. | Lives<br>(A)<br>(C)              | tock is important source of:<br>Milk<br>Manure  | (B)<br>(D)            | Meat<br>All of these                                |
| 167. | Dairy<br>(A)<br>(C)              | cattle and buffalo can be called as:<br>Caprine<br>Bovine                                 | (B)<br>(D)            | Ovine<br>Equine                                     |
| 168. | Best<br>(A)<br>(C)               | breed of buffalo in India:<br>Nili Ravi<br>Surti  | (B)<br>(D)            | Murrah<br>Toda                                      |
| 169. | Best I<br>(A)<br>(C)             | layer poultry strain is:<br>WLH<br>Karaknath  | (B)<br>(D)            | Minorca<br>Sutlez                                   |
| 170. | Norm<br>(A)<br>(C)               | nal birth weight (Kg) of healthy buffalo c<br>20<br>40                                    | alf is:<br>(B)<br>(D) | 30<br>50  |
| 171. | Numl<br>(A)<br>(C)               | ber of teats in buffalo:<br>2<br>6  | (B)<br>(D)            | 4<br>8  |
| 172. | Dry r<br>(A)<br>(C)              | natter requirement (kg) of a cow weighing<br>8<br>12                                      | g 400<br>(B)<br>(D)   | kg is:<br>10<br>14                                  |
| 173. | Green<br>(A)<br>(C)              | n fodder requirement of adult cattle (kg):<br>30<br>50                                    | (B)<br>(D)            | 40<br>60  |

174. Which of the following crops is the best for hay making: (A) Jowar (B) Bajra (D) Oat (C) Berseem 175. Normal body temperature of healthy poultry bird (°F): 37.0 (A) (B) 98.6 (D) 117.0 (C) 107.0 176. ICAR-National Dairy Research Institute (NDRI) is located at: (A) Karnal (B) New Delhi (C) Bareilly (D) Anand 177. Excessive gas accumulation in rumen indicates: Impaction (B) Bloat (A) (C) Milk fever (D) Foot and Mouth Disease 178. Most fatal disease in farm animals is: Foot and Mouth Disease (B) HS (A) (C) Rinderpest (D) Anthrax 179. Semen is stored in liquid nitrogen at (°C): (A) -79 (B) -196 79 (D) 196 (C) 180. During Artificial Insemination (AI) semen should be deposited Vagina (B) Cervix (A) (C) Uterus (D) Fallopian tube 181. Seeds of groundnut contain about: 25% oil and 50% protein (B) 20% oil and 40% protein (A) (C) 40% oil and 40% protein (D) 50% oil and 25% protein 182. Organic carbon is a measure of Available nitrogen in soil (A) (B) Available nutrient in soil (C) Excess of carbon in soil (D) Excess of iron in soil 183. Which among the following element is considered immobile in the plant (A) Calcium (B) Phosphorus Nitrogen (D) Magnesium (C)

184. Which among the following is recommended variety of durum wheat:(A) HD 2960 (B) WH 896

|      | (C)                  | PBW 725  | (D)                   | WH 711   |
|------|----------------------|--|-----------------------|--|
| 185. | Recon<br>(A)<br>(C)  | mmended dose of nutrients for berseem (k<br>10 kg N, 28 kg P <sub>2</sub> O <sub>5</sub><br>20 kg N, 40 kg P <sub>2</sub> O <sub>5</sub> | (B)<br>(D)            | e) is:<br>40 kg N, 25 kg P <sub>2</sub> O <sub>5</sub><br>20 kg N, 20 kg P <sub>2</sub> O <sub>5</sub> |
| 186. | Optin<br>(A)<br>(C)  | num row spacing for cotton is:<br>50 cm<br>67.5 cm   | (B)<br>(D)            | 60 cm<br>75 cm   |
| 187. | Optin<br>(A)<br>(C)  | num sowing time of summer moong in the<br>March<br>First fortnight of April  | e state<br>(B)<br>(D) | is:<br>Second fortnight of February<br>End June-early July   |
| 188. | 'Whit                | te alkali' soil refers to:   |                       |  |
|      | (A)<br>(C)           | Acid soil<br>Salina sodic soil   | (B)<br>(D)            | Saline soil<br>Sodic soil  |
| 189. | The e<br>(A)<br>(C)  | xchange sodium percentage (ESP) of alka<br>More than 15<br>Less than 15  | ali soi<br>(B)<br>(D) | ls is always:<br>Any value<br>Less than 7.5  |
| 190. | ICAR<br>(A)<br>(C)   | R-Central Arid Zone Research Institute is<br>Nagpur<br>New Delhi   | locate<br>(B)<br>(D)  | ed at:<br>Hyderabad<br>Jodhpur   |
| 191. | India<br>(A)<br>(C)  | is divided in to ecological zones.<br>12<br>15   | (B)<br>(D)            | 10<br>20   |
| 192. | Recon<br>(A)<br>(C)  | mmended seed rate (kg/ha) of dhaincha on<br>20<br>40   | r sunh<br>(B)<br>(D)  | emp for green manuring is:<br>30<br>50   |
| 193. | Recon<br>(A)<br>(C)  | mmended seed rate for <i>spring</i> season mur<br>15-20 kg per acre<br>15-20 kg per hectare  | ngbear<br>(B)<br>(D)  | n is<br>25-30 kg per hectare<br>10 kg per hectare  |
| 194. | For tr<br>(A)<br>(C) | ansplanting of pearl millet (bajra) in Hary<br>Two weeks<br>Four weeks   | /ana, (B)<br>(D)      | optimum age of seedlings is:<br>Three weeks<br>Five weeks  |
| 195. | Blind<br>(A)<br>(C)  | tillage refers to:<br>Summer ploughing<br>Hoeing before germination  | (B)<br>(D)            | Primary tillage<br>Hoeing in standing crop rows  |
|      |                      |  |                       |  |

<sup>196.</sup> Flame photometer is used for the determination of:

- (A) Nitrogen
- (C) Potassium

- (B) Phosphorus
- (D) Boron
- 197. Tetrazolium test is conducted to test the:
  - (A) Physical purity of seed
  - (C) Viability of seed

- (B) Percentage of weed seeds
- (D) Seed germination

- 198. World Food Day is celebrated on:
  - (A) 5 June(C) 28 February

- (B) 20 June
- (D) 16 October

199. Which among the following is the best and cheapest method of weed control:

- (A) Cultural measures (B) Herbicide based weed control
  - (C) Biological control

- (D) Preventive measures
- 200. Black soils in India belong to soil order:
  - (A) Alfisol
  - (C) Vertisol

- (B) Inceptisol
- (D) Oxisol

| Sr. | Question  |                |                              |  |  |  |
|-----|---|----------------|------------------------------|--|--|--|
| No. |   |                |                              |  |  |  |
| 1.  | Which of the following cells in plants show totipotency |                |                              |  |  |  |
|     | (A) Xylem vessels                                       | (B)            | Sieve tubes                  |  |  |  |
|     | (C) Meristem  | (D)            | Cork cells                   |  |  |  |
| 2.  | Father of taxonomy is                                   |                |                              |  |  |  |
|     | (A) John Ray  | (B)            | Linnaeus                     |  |  |  |
|     | (C) Aristotle   | (D)            | Lamark                       |  |  |  |
| 3.  | Which of the following has more characters in con       | nmon           |                              |  |  |  |
|     | (A) Species   | (B)            | Genus                        |  |  |  |
| _   | (C) Class   | (D)            | Division                     |  |  |  |
| 4.  | Riccia is a liverwort as it                             |                |                              |  |  |  |
|     | (A) produces liver diseases                             | (B)            | is present in liver          |  |  |  |
| -   | (C) cures liver diseases                                | (D)            | is like a flat lobed thallus |  |  |  |
| 5.  | Gymnosperms are characterized by                        |                |                              |  |  |  |
|     | (A) Large leaves  | (B)            | Ciliated sperms              |  |  |  |
|     | (C) Naked ovules  | (D)            | Scale leaves                 |  |  |  |
| 6.  | A root parasite is                                      |                |                              |  |  |  |
|     | (A) Cuscuta   | (B)            | Striga                       |  |  |  |
|     | (C) Brassica  | (D)            | loranthus                    |  |  |  |
| 7.  | Roots that grow from any part of the plant body ot      | her that       | an the radicles are          |  |  |  |
|     | (A) Adventitious roots                                  | (B)            | Tap roots                    |  |  |  |
|     | (C) Modified roots                                      | (D)            | Aerial roots                 |  |  |  |
| 8.  | Parallel venation is a characteristic of                |                |                              |  |  |  |
|     | (A) Parasitic plants                                    | (B)            | Xerophytic plants            |  |  |  |
| 0   | (C) Legumes   | (D)            | Grasses                      |  |  |  |
| 9.  | A bisexual flower which never opens in its life spa     | in is ca       | alled                        |  |  |  |
|     | (A) Cleistogamus  | (B)            | Heterogamus                  |  |  |  |
| 10  | (C) Homogamus   | (D)            | Dichogamus                   |  |  |  |
| 10. | Quiescent centre is located in                          | <b>(D</b> )    | Deatanay                     |  |  |  |
|     | (A) Shoot apex $(C)$ Leaf apex                          | (D)            | Root apex<br>Pud apex        |  |  |  |
| 11  | (C) Leaf apex<br>Cosporion strips occur in the cells of | (D)            | Buu apex                     |  |  |  |
| 11. | (A) Enidermis   | (B)            | Exodermis                    |  |  |  |
|     | (C) Endodermis  | $(\mathbf{D})$ | Hypodermis                   |  |  |  |
| 12  | Vascular hundles are absent in                          | (D)            | Hypodellins                  |  |  |  |
| 12. | (A) Monocots  | (B)            | Dicots                       |  |  |  |
|     | (C) Gymnosperms   | (D)            | Pteridophytes                |  |  |  |
| 13  | Aerenchyma is derived from                              | (2)            | i terraophytes               |  |  |  |
| 10. | (A) Parenchyma  | (B)            | Sclerenchyma                 |  |  |  |
|     | (C) Phloem  | (D)            | Xvlem                        |  |  |  |
| 14. | Vascular bundle having cambium is                       | (-)            |                              |  |  |  |
|     | (A) closed  | (B)            | open                         |  |  |  |
|     | (C) conjoint  | (D)            | collateral                   |  |  |  |
| 15. | What do you eat in coconut                              |                |                              |  |  |  |
|     | (A) Embryo  | (B)            | Mesocarp                     |  |  |  |
|     | (C) Entire seed   | (D)            | Fruit wall                   |  |  |  |
| 16. | Phyllode is a modification of                           | · /            |                              |  |  |  |
|     | (A) Flower  | (B)            | Bud                          |  |  |  |
|     | (C) Root  | (D)            | Petiole                      |  |  |  |
|     |   |                |                              |  |  |  |

| 17.         | Fingermillet is   |                   |                             |
|-------------|---|-------------------|-----------------------------|
|             | (A) Eleusine  | (B)               | Setaria                     |
|             | (C) Pennisetum  | (D)               | Sorghum                     |
| 18.         | Microsporophyll of Cycas is equivalent to                                 | of                | angiosperms                 |
|             | (A) Sepal   | (B)               | Stamen                      |
|             | (C) Ovary   | (D)               | Ovule                       |
| 19.         | Jackfruit is an example of  |                   |                             |
|             | (A) Multiple fruit  | (B)               | Aggregate fruit             |
|             | (C) Simple fruit  | (D)               | None of these               |
| 20.         | Anther wall in angiosperms contain how many w                             | all laver         | S                           |
|             | (A) 3   | (B)               | 4                           |
|             | (C) 5   | (D)               | 6                           |
| 21.         | If an endosperm cell of angiosperm has 36 chrom                           | losomes           | , the root cell should have |
|             | (A) 18  | (B)               | 16                          |
|             | (C) 4   | (D)               | 24                          |
| 22.         | Amino acid synthetase enzyme is activated by                              | (2)               |                             |
|             | (A) Mg  | (B)               | Cu                          |
|             | (C) Zn  | (D)               | Fe                          |
| 23          | Number of net gain ATP in aerobic respiration is                          | (2)               |                             |
| 20.         | (A) $2$   | (B)               | 42                          |
|             | $(\Gamma) = \frac{2}{38}$   | (D)               | 41                          |
| 24          | One glucose molecule partially oxidized in anaer                          | obic res          | niration produces           |
| <i>2</i> 1. | $(\Delta)$ 30 $\Delta$ TPs  | $(\mathbf{R})$    | 38 A TPs                    |
|             | $(\Gamma)$ 2 ATPs   | (D)               | 15 ATPs                     |
| 25          | In forest ecosystem green plants are                                      | (D)               | 10/1115                     |
| 23.         | (A) Primary consumers   | $(\mathbf{R})$    | Primary producers           |
|             | (C) Decomposers   | (D)               | None of these               |
| 26          | The largest cell in the embryo sac is                                     | (D)               | None of these               |
| 20.         | (A) Central cell  | $(\mathbf{R})$    | Faa                         |
|             | (C) Synergids   | (D)               | Lgg<br>None of these        |
| 27          | Double membrane is absent in  | (D)               | None of these               |
| 27.         | (A) Mitochondria  | $(\mathbf{R})$    | Chloroplast                 |
|             | (A) Mitochondria<br>(C) Perovisome  | (D)               | Colgi body                  |
| 28          | DNA content is doubled in stage of cel                                    | (D)<br>Il divisio | Oolgi body                  |
| 20.         | (A) Prophase  | $(\mathbf{R})$    | Metanhase                   |
|             | (A) Trophase $(C)$ $C$ phase  | (D)               | S phase                     |
| 20          | A group of individuals of different species is call                       | (D)<br>ad         | 3- phase                    |
| 29.         | (A) Population  | CU<br>(P)         | Community                   |
|             | (A) Topulation<br>(C) Biome   | (D)               | None of these               |
| 20          | (C) Diome   | (D)               | None of these               |
| 30.         | $ (A) \qquad A dening and Cugning $                                       | <b>(D)</b>        | Cuaning and Cutaging        |
|             | (A) Adenine and Guanne<br>(C) Thymine and Cytoging                        | (D)               | A daming and Thyming        |
| 21          | (C) Infinite and Cytochie<br>The normant which is chart in chloroplast is | (D)               | Adenine and Thymine         |
| 51.         | (A) Chlorophyll 'o'   | <b>(D</b> )       | Chlorophyll (h)             |
|             | (A) Uniorophyli a<br>(C) Venthebell                                       | (B)               | Chlorophyll b               |
| 22          | (C) Xaninpnyn<br>Data of transministion is moosynad hy                    | (D)               | Anthocyanine                |
| 32.         | (A) Menunetar   | <b>(D</b> )       | Determenter                 |
|             | (A) Manometer   | (B)               | Potometer                   |
| 22          | (C) Auxanometer   | (D)               | none of these               |
| 55.         | I ne site of primary photochemical reaction is                            |                   | Course                      |
|             | (A) Stroma<br>(C) Derivlent a it  | (B)               | Grana                       |
|             | (C) Periplast cavity  | (D)               | Inner layer                 |

| (A)       N. Borlaug       (B)       K.C. Mehta         (C)       M.S. Swaminathan       (D)       None of these         35.       Plants which grow in shade are       (A)       Sciophytes       (D)         (A)       Sciophytes       (D)       Psamophytes         36.       The amount of living material in different trophic levels is called         (A)       Standing crop       (B)       Standing state         (C)       Upry weight       (D)       Biomass         37.       In pond ecosystem pyramid of number is always         (A)       Straight       (B)       Linear         (C)       Upright       (D)       Inverted         38.       Vegetation dominated by shrubs with few tall trees is called         (A)       Secule       (B)       Marsh         (C)       Grassland       (D)       Forest         39.       Total energy produced during photosynthesis is called         (A)       Total biomass       (B)       Primary consumers         (C)       Kerpinary producers of the ecosystem are       (A)       Grassland       (D)       Nore of these         41.       The chemical knives of DNA are       (A)       Ligases       (D)       Thanscriptases   | 34. | Father              | of green revolution in India is                  |                |                          |
|---|-----|---------------------|--|----------------|--------------------------|
| (C)       M.S. Swaminathan       (D)       None of these         35.       Plants which grow in shade are       (A)       Sciophytes       (D)       Psamophytes         36.       The amount of living material in different trophic levels is called       (A)       Standing state         (C)       Dry weight       (D)       B)       Standing state         (C)       Dry weight       (D)       Biomass         37.       In pond ecosystem pyramid of number is always       (A)       Straight       (D)         (A)       Straight       (D)       Inverted         38.       Vegetation dominated by shrubs with few tall trees is called       (A)       Serule       (B)         (C)       Grassland       (D)       Forest       39.         70tal energy produced during photosynthesis is called       (A)       Total biomass       (B)       Net biomass         (C)       Grassland       (D)       Gross primary produced         40.       Secondary produces of the ecosystem are       (A)       It be chemical knives of DNA are         (A)       Ligases       (B)       Polymerases         (C)       Foron massori       (D)       Basmati         43.       Pusa Komal is a variety of       (A)  |     | (A)                 | N. Borlaug                                       | (B)            | K.C. Mehta               |
| <ul> <li>35. Plants which grow in shade are <ul> <li>(A) Sciophytes</li> <li>(B) Heliophytes</li> <li>(C) Halophytes</li> <li>(D) Psamophytes</li> </ul> </li> <li>36. The amount of living material in different trophic levels is called <ul> <li>(A) Standing crop</li> <li>(B) Standing state</li> <li>(C) Dry weight</li> <li>(D) Biomass</li> </ul> </li> <li>37. In pond ecosystem pyramid of number is always <ul> <li>(A) Straight</li> <li>(B) Linear</li> <li>(C) Upright</li> <li>(D) Inverted</li> </ul> </li> <li>38. Vegetation dominated by shrubs with few tall trees is called <ul> <li>(A) Straight</li> <li>(B) Marsh</li> <li>(C) Grassland</li> <li>(D) Forest</li> </ul> </li> <li>39. Total energy produced during photosynthesis is called <ul> <li>(A) Total biomass</li> <li>(B) Net biomass</li> <li>(C) Net primary production</li> <li>(D) Gross primary produced during photosynthesis is called</li> <li>(A) Total biomass</li> <li>(B) Primary consumers</li> <li>(C) Top consumers</li> <li>(D) None of these</li> </ul> </li> <li>41. The chemical knives of DNA are <ul> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Regument</li> <li>(B) Funiculus</li> <li>(C) Sona masoori</li> <li>(D) Hilum</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Springyra</li> <li>(D) Chamydomonas</li> </ul> </li> <li>47. Wallisneria usually favours <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Amazon rain forest</li> <li>(D) Anemophily</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) Philoern cells</li> <li>(D) Xylem cells</li> </ul>   |     | (C)                 | M.S. Swaminathan                                 | (D)            | None of these            |
| (A)       Scioplytes       (B)       Heliophytes         (C)       Halophytes       (D)       Psamophytes         36.       The amount of living material in different trophic levels is called         (A)       Standing crop       (B)       Standing state         (C)       Dry weight       (D)       Biomass         37.       In pond ecosystem pyranid of number is always         (A)       Straight       (B)       Linear         (C)       Upright       (D)       Inverted         38.       Vegetation dominated by shrubs with few tall trees is called       (A)         (A)       Serule       (B)       Marsh         (C)       Grassland       (D)       Forest         39.       Total biomass       (B)       Net biomass         (C)       Net primary production       (D)       Gross primary product         (A)       Green plants       (B)       Primary consumers         (C)       Top consumers       (D)       None of these         41.       The chemical knives of DNA are       (A)       Linears         (A)       Igases       (B)       Jaya         (C)       Sona masoori       (D)       B asmati         <  | 35. | Plants              | which grow in shade are                          |                |                          |
| (C)       Halophytes       (D)       Psamophytes         36.       The amount of living material in different trophic levels is called       (A)       Standing state         (C)       Dry weight       (D)       Biomass         37.       In pond ecosystem pyramid of number is always       (A)       Straight       (D)         (C)       Upright       (D)       Inverted         38.       Vegetation dominated by shrubs with few tall trees is called       (A)       Straight         (A)       Straight       (B)       Marsh         (C)       Grassland       (D)       Forest         39.       Total energy produced during photosynthesis is called       (A)       Total biomass         (A)       Total biomass       (B)       Nert biomass         (C)       Not the pimary production       (D)       Gross primary producto         40.       Stecondary producers of the ecosystem are       (A)       (A)       Groen plants       (B)       Primary consumers         (C)       Forgensumers       (D)       None of these       (D)       Franscriptases         41.       The chemical knives of DNA are       (A)       IR 8       (B)       Jaya         (C)       Sona masoori       (D)   |     | (A)                 | Sciophytes                                       | (B)            | Heliophytes              |
| <ul> <li>36. The amount of living material in different trophic levels is called <ul> <li>(A) Standing crop</li> <li>(B) Standing state</li> <li>(C) Dry weight</li> <li>(D) Biomass</li> </ul> </li> <li>37. In pond ecosystem pyramid of number is always <ul> <li>(A) Straight</li> <li>(B) Linear</li> <li>(C) Upright</li> <li>(D) Inverted</li> </ul> </li> <li>38. Vegetation dominated by shrubs with few tall trees is called <ul> <li>(A) Scrule</li> <li>(B) Marsh</li> <li>(C) Grassland</li> <li>(D) Forest</li> </ul> </li> <li>39. Total energy produced during photosynthesis is called <ul> <li>(A) Total biomass</li> <li>(B) Net biomass</li> <li>(C) Net primary production</li> <li>(D) Gross primary producers of the ecosystem are</li> <li>(A) Green plants</li> <li>(B) Primary consumers</li> <li>(D) None of these</li> </ul> </li> <li>41. The chemical knives of DNA are</li> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> </ul> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Chilli</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Needicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) An example of single cell protein is</li> <li>(A) 1986</li> <li>(B) Eastern ghats</li> <li>(C) Anazon rain forest</li> <li>(D) Chamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) 1986</li> <li>(B) Cambial cells</li> <li>(C) Pholem cells</li> <li>(D) Xylem cells</li> </ul> </li>  |     | (C)                 | Halophytes                                       | (D)            | Psamophytes              |
| (A) Standing crop       (B) Standing state         (C) Dry weight       (D) Biomass         37. In pond ecosystem pyramid of number is always       (A) Straight       (B) Linear         (A) Straight       (B) Linear       (D) Inverted         38. Vegetation dominated by shrubs with few tall trees is called       (A) Scrule       (B) Marsh         (C) Grassland       (D) Forest       (D) Forest         39. Total energy produced during photosynthesis is called       (A) Total biomass       (B) Net biomass         (C) Net primary production       (D) Gross primary productor       (D) Gross primary productor         40. Secondary producers of the ecosystem are       (A) Green plants       (B) Primary consumers         (C) Top consumers       (D) None of these         41. The chemical knives of DNA are       (A) Ligases       (B) Polymerases         (C) Endonucleases       (D) Transcriptases       42.         (A) IR 8       (B) Jaya       (C) Sona masoori       (D) Basmati         43. Pusa Komal is a variety of       (A) Cowpea       (B) Funiculus         (C) Integument       (D) Hilum       (D) Hilum         44. The stalk of the ovule that attaches it to the placenta in angiosperms is       (A) Pedicel       (B) Funiculus         (C) Integument       (D) Hilum       (D) Anemophily <t< td=""><td>36.</td><td>The ar</td><td>nount of living material in different trophic</td><td>levels</td><td>is called</td></t<>   | 36. | The ar              | nount of living material in different trophic    | levels         | is called                |
| (C)       Dry weight       (D)       Biomass         37.       In pond ecosystem pyramid of number is always       (A)       Straight       (B)       Linear         (C)       Upright       (D)       Inverted       38       Vegetation dominated by shrubs with few tall trees is called         (A)       Serule       (B)       Marsh       (C)       Grassland       (D)       Forest         39.       Total energy produced during photosynthesis is called       (A)       Total biomass       (B)       Net biomass         (C)       Net primary production       (D)       Gross primary produce         40.       Secondary producers of the ecosystem are       (A)       Green plants       (B)       Primary consumers         (A)       Green plants       (D)       None of these       11.       The chemical knives of DNA are         (A)       Ligases       (D)       Transcriptases       12.         (C)       Endonucleases       (D)       Transcriptases         (Z)       The Indian variety of rice patented by an American company is       (A)       IA         (A)       IR 8       (B)       Jaya       (C)       Brassica       (D)       Chilli         43.       Pusa Komal is a variety of <td< td=""><td></td><td>(A)</td><td>Standing crop</td><td>(B)</td><td>Standing state</td></td<>  |     | (A)                 | Standing crop                                    | (B)            | Standing state           |
| <ul> <li>37. In pond ecosystem pyramid of number is always <ul> <li>(A) Straight</li> <li>(B) Linear</li> <li>(C) Upright</li> <li>(D) Inverted</li> </ul> </li> <li>38. Vegetation dominated by shrubs with few tall trees is called <ul> <li>(A) Serule</li> <li>(B) Marsh</li> <li>(C) Grassland</li> <li>(D) Forest</li> </ul> </li> <li>39. Total energy produced during photosynthesis is called <ul> <li>(A) Total biomass</li> <li>(B) Net biomass</li> <li>(C) Net primary production</li> <li>(D) Gross primary produce</li> </ul> </li> <li>40. Secondary producers of the ecosystem are <ul> <li>(A) Green plants</li> <li>(B) Primary consumers</li> <li>(C) Top consumers</li> <li>(D) None of these</li> </ul> </li> <li>41. The chemical knives of DNA are <ul> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> </ul> </li> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) 1986</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>(A) 1986</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li></ul></li></ul> |     | (C)                 | Dry weight                                       | (D)            | Biomass                  |
| (A)       Straight       (B)       Linear         (C)       Upright       (D)       Inverted         38.       Vegetation dominated by shrubs with few tall trees is called       (A)       Serule       (B)         (A)       Serule       (B)       Marsh       (C)       Grassland       (D)         39.       Total energy produced during photosynthesis is called       (A)       Total biomass       (B)       Net biomass         (C)       Grassland       (D)       Forest       39       Total energy produced during photosynthesis is called         (A)       Total biomass       (B)       Net biomass       (C)       Gross primary produced         40.       Secondary producers of the ecosystem are       (A)       Green plants       (B)       Primary consumers         (C)       Top consumers       (D)       None of these       41.         11.       The chemical knives of DNA are       (B)       Polymerases         (C)       Top consumers       (D)       Transcriptases         42.       The Indian variety of rice patented by an American company is       (A)       IA         (A)       IR 8       (B)       Jaya       (C)       Sona masoori       (D)       Chastatatatatatatatatatatatatatatatatata   | 37. | In pon              | d ecosystem pyramid of number is always          | . /            |                          |
| (C)       Upright       (D)       Inverted         38.       Vegetation dominated by shrubs with few tall trees is called       (A)       Serule       (B)         (A)       Serule       (B)       Marsh       (C)       Grassland       (D)       Forest         39.       Total energy produced during photosynthesis is called       (A)       Total biomass       (B)       Net biomass         (C)       Net primary production       (D)       Gross primary produce         40.       Secondary producers of the ecosystem are       (A)       Green plants       (B)       Primary consumers         (A)       Green plants       (B)       Primary consumers       (C)       The chemical knives of DNA are         (A)       Ligases       (D)       Transcriptases       (D)       Transcriptases         41.       The chemical knives of DNA are       (C)       Endonucleases       (D)       Transcriptases         42.       The Indian variety of rice patented by an American company is       (A)       IR 8       (B)       Jaya         (C)       Sona masoori       (D)       Basmati       Basmati         43.       Pusa Komal is a variety of       (A)       Cowpea       (B)       Vhiulin         (C)       <  |     | (A)                 | Straight   | (B)            | Linear                   |
| <ul> <li>38. Vegetation dominated by shrubs with few tall trees is called <ul> <li>(A) Serule</li> <li>(B) Marsh</li> <li>(C) Grassland</li> <li>(D) Forest</li> </ul> </li> <li>39. Total energy produced during photosynthesis is called <ul> <li>(A) Total biomass</li> <li>(B) Net biomass</li> <li>(C) Net primary production</li> <li>(D) Gross primary product</li> </ul> </li> <li>40. Secondary producers of the ecosystem are <ul> <li>(A) Green plants</li> <li>(B) Primary consumers</li> <li>(C) Top consumers</li> <li>(D) None of these</li> </ul> </li> <li>41. The chemical knives of DNA are <ul> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> </ul> </li> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) I986</li> <li>(B) 1902</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"?? <ul> <li>(A) 1986</li> <li>(B) 1996</li> </ul> </li> <li>49. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) Epidermal cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>  |     | (C)                 | Upright  | (D)            | Inverted                 |
| (A) Serule       (B) Marsh         (C) Grassland       (D) Forest         39. Total energy produced during photosynthesis is called       (A) Total biomass         (A) Total biomass       (B) Net biomass         (C) Net primary production       (D) Gross primary productor         40. Secondary producers of the ecosystem are       (A) Green plants       (B) Primary consumers         (A) Green plants       (B) Polymerases       (D) Transcriptases         41. The chemical knives of DNA are       (A) Ligases       (B) Polymerases         (C) Endonucleases       (D) Transcriptases         42. The Indian variety of rice patented by an American company is         (A) IR 8       (B) Jaya         (C) Sona masoori       (D) Basmati         43. Pusa Komal is a variety of       (A) Cowpea         (A) Pedicel       (B) Funiculus         (C) Integument       (D) Chilli         44. The stalk of the ovule that attaches it to the placenta in angiosperms is         (A) Pedicel       (B) Funiculus         (C) Integument       (D) Hilum         45. Vallisneria usually favours       (A) Zoophily         (A) Spirulina       (B) Volvox         (C) Amazon rain forest       (D) Chlamydomonas         47. Which forest is named as the "Lungs of the planet"? <t< td=""><td>38.</td><td>Veget</td><td>ation dominated by shrubs with few tall trees</td><td>s is cal</td><td>led</td></t<>  | 38. | Veget               | ation dominated by shrubs with few tall trees    | s is cal       | led                      |
| (C)       Grassland       (D)       Forest         39.       Total energy produced during photosynthesis is called       (A)       Total biomass       (B)       Net biomass         (A)       Total biomass       (B)       Net biomass       (C)       Gross primary products         40.       Secondary producers of the ecosystem are       (A)       Green plants       (B)       Primary consumers         (A)       Green plants       (B)       Polymerases       (C)       Top consumers       (D)       None of these         41.       The chemical knives of DNA are       (A)       Ligases       (B)       Polymerases         (C)       Endonucleases       (D)       Transcriptases       10)       Transcriptases         42.       The Indian variety of rice patented by an American company is       (A)       IR 8       (B)       Jaya         (C)       Sona masoori       (D)       Basmati       11       14       The stalk of the ovule that attaches it to the placenta in angiosperms is         (A)       Pedicel       (B)       Funiculus       (C)       Integument       (D)       Hilum         45.       Vallisneria usually favours       (A)       Zoophily       (B)       Entomophily         (C)       <  |     | (A)                 | Serule   | (B)            | Marsh                    |
| <ul> <li>39. Total energy produced during photosynthesis is called <ul> <li>(A) Total biomass</li> <li>(B) Net biomass</li> <li>(C) Net primary production</li> <li>(D) Gross primary produce</li> </ul> </li> <li>40. Secondary producers of the ecosystem are <ul> <li>(A) Green plants</li> <li>(B) Primary consumers</li> <li>(C) Top consumers</li> <li>(D) None of these</li> </ul> </li> <li>41. The chemical knives of DNA are <ul> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> </ul> </li> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"?? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | (C)                 | Grassland  | (D)            | Forest                   |
| (A) Total biomass       (B) Net biomass         (A) Total biomass       (D) Gross primary product         40. Secondary producers of the ecosystem are       (A) Green plants       (B) Primary consumers         (A) Green plants       (B) Polymerases       (D) None of these         41. The chemical knives of DNA are       (A) Ligases       (B) Polymerases         (C) Endonucleases       (D) Transcriptases         42. The Indian variety of rice patented by an American company is         (A) IR 8       (B) Jaya         (C) Sona masoori       (D) Basmati         43. Pusa Komal is a variety of       (A) Cowpea         (A) Cowpea       (B) Wheat         (C) Brassica       (D) Chilli         44. The stalk of the ovule that attaches it to the placenta in angiosperms is         (A) Pedicel       (B) Funiculus         (C) Integument       (D) Hilum         45. Vallisneria usually favours       (A) Zoophily         (A) Spirulina       (B) Volvox         (C) Spirogyra       (D) Chlamydomonas         47. Which forest is named as the "Lungs of the planet"??         (A) Western ghats       (B) Eastern ghats         (C) Amazon rain forest       (D) Sahara desert         48. The earth summit held at Rio de Janeiro was in the year         (A) 1986  | 39. | Total               | energy produced during photosynthesis is ca      | lled           |                          |
| (C)       Net primary production       (D)       Gross primary product         40.       Secondary producers of the ecosystem are       (A)       Green plants       (B)       Primary consumers         (A)       Green plants       (B)       Primary consumers       (D)       None of these         41.       The chemical knives of DNA are       (A)       Ligases       (B)       Polymerases         (A)       Ligases       (B)       Polymerases       (D)       Transcriptases         42.       The Indian variety of rice patented by an American company is       (A)       IR 8       (B)       Jaya         (C)       Sona masoori       (D)       Basmati         43.       Pusa Komal is a variety of       (A)       Cowpea       (B)       Wheat         (C)       Brassica       (D)       Chilli         44.       The stalk of the ovule that attaches it to the placenta in angiosperms is       (A)       Pedicel       (B)       Funiculus         (C)       Integument       (D)       Hilum       45.       Valisneria usually favours         (A)       Zoophily       (B)       Entomophily       (C)       Hydrophily       (D)       Anemophily         (C)       Hydrophily       (D)  |     | (A)                 | Total biomass                                    | (B)            | Net biomass              |
| <ul> <li>40. Secondary producers of the ecosystem are <ul> <li>(A) Green plants</li> <li>(B) Primary consumers</li> <li>(C) Top consumers</li> <li>(D) None of these</li> </ul> </li> <li>41. The chemical knives of DNA are <ul> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> </ul> </li> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | (C)                 | Net primary production                           | (D)            | Gross primary production |
| (A)       Green plants       (B)       Primary consumers         (C)       Top consumers       (D)       None of these         41.       The chemical knives of DNA are       (A)       Ligases       (D)         (A)       Ligases       (D)       Transcriptases         (C)       Endonucleases       (D)       Transcriptases         42.       The Indian variety of rice patented by an American company is       (A)         (A)       IR 8       (B)       Jaya         (C)       Sona masoori       (D)       Basmati         43.       Pusa Komal is a variety of       (A)       Cowpea       (B)         (A)       Cowpea       (B)       Wheat       (C)         (C)       Brassica       (D)       Chilli         44.       The stalk of the ovule that attaches it to the placenta in angiosperms is       (A)       Pedicel       (B)       Funculus         (C)       Integument       (D)       Hilum       Hilum       45.         45.       Vallisneria usually favours       (A)       Zoophily       (B)       Entomophily         (C)       Hydrophily       (D)       Anemophily       (D)       Chlamydomonas         46.       An examp   | 40  | Secon               | dary producers of the ecosystem are              | (-)            | F F                      |
| <ul> <li>(C) Top consumers</li> <li>(D) None of these</li> <li>The chemical knives of DNA are</li> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> <li>(E) Endonucleases</li> <li>(D) Basmati</li> <li>(E) Sona masoori</li> <li>(D) Basmati</li> <li>(E) Brassica</li> <li>(D) Chilli</li> <li>(E) Functulus</li> <li>(C) Integument</li> <li>(D) Chilli</li> <li>(E) Functulus</li> <li>(C) Integument</li> <li>(D) Anemophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> <li>(C) Hydrophily</li> <li>(D) Chlamydomonas</li> <li>(E) Spirogyra</li> <li>(D) Chlamydomonas</li> <li>(E) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>(E) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>(E) Amazon rain forest</li> <li>(E) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>(E) Endomuch at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>(E) Endomic ells</li> <li>(E) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>   |     | (A)                 | Green plants                                     | (B)            | Primary consumers        |
| <ul> <li>41. The chemical knives of DNA are <ul> <li>(A) Ligases</li> <li>(B) Polymerases</li> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> </ul> </li> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | (C)                 | Top consumers                                    | (D)            | None of these            |
| (A)       Ligases       (B)       Polymerases         (C)       Endonucleases       (D)       Transcriptases         42.       The Indian variety of rice patented by an American company is       (A)       IR 8       (B)       Jaya         (C)       Sona masoori       (D)       Basmati         43.       Pusa Komal is a variety of       (A)       Cowpea       (B)       Wheat         (C)       Brassica       (D)       Chilli       Cowpea       (B)       Funiculus         44.       The stalk of the ovule that attaches it to the placenta in angiosperms is       (A)       Pedicel       (B)       Funiculus         (C)       Integument       (D)       Hilum       Hilum       C)       Hilum         45.       Vallisneria usually favours       (A)       Zoophily       (B)       Entomophily         (C)       Hydrophily       (D)       Anemophily       (C)       Hydrophily       (D)       Chlamydomonas         47.       Which forest is named as the "Lungs of the planet"??       (A)       Western ghats       (B)       Eastern ghats         (C)       Amazon rain forest       (D)       Sahara desert       He       A       Remain theld at Rio de Janeiro was in the year       (A)  | 41  | The cl              | nemical knives of DNA are                        | (-)            |                          |
| <ul> <li>(C) Endonucleases</li> <li>(D) Transcriptases</li> <li>42. The Indian variety of rice patented by an American company is</li> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>   |     | (A)                 | Ligases  | (B)            | Polymerases              |
| <ul> <li>42. The Indian variety of rice patented by an American company is <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> </ul> </li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | (C)                 | Endonucleases                                    | (D)            | Transcriptases           |
| <ul> <li>(A) IR 8</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  | 42. | The In              | dian variety of rice patented by an American     | 1  comr        | anv is                   |
| <ul> <li>(A) IK o</li> <li>(B) Jaya</li> <li>(C) Sona masoori</li> <li>(D) Basmati</li> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | $(\Lambda)$         | ID Q   | (D)            | Iovo                     |
| <ul> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>   |     | (A)                 |  | (D)            | Jaya                     |
| <ul> <li>43. Pusa Komal is a variety of <ul> <li>(A) Cowpea</li> <li>(B) Wheat</li> <li>(C) Brassica</li> <li>(D) Chilli</li> </ul> </li> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>   |     | (C)                 | Sona masoori                                     | (D)            | Basmati                  |
| (A) Cowpea(B) Wheat(C) Brassica(D) Chilli44.The stalk of the ovule that attaches it to the placenta in angiosperms is(A) Pedicel(B) Funiculus(C) Integument(D) Hilum45.Vallisneria usually favours(A) Zoophily(B) Entomophily(C) Hydrophily(D) Anemophily(C) Hydrophily(D) Anemophily46.An example of single cell protein is(A) Spirulina(B) Volvox(C) Spirogyra(D) Chlamydomonas47.Which forest is named as the "Lungs of the planet"?(A) Western ghats(B) Eastern ghats(C) Amazon rain forest(D) Sahara desert48.The earth summit held at Rio de Janeiro was in the year(A) 1986(B) 1902(C) 1992(D) 199649.Lignified cell wall occurs in(A) Epidermal cells(B) Cambial cells(C) Phloem cells(D) Xylem cells   | 43. | Pusa k              | Komal is a variety of                            |                |                          |
| (C)Brassica(D)Chilli44.The stalk of the ovule that attaches it to the placenta in angiosperms is<br>(A)Pedicel(B)Funiculus<br>(C)(C)Integument(D)Hilum45.Vallisneria usually favours<br>(A)Zoophily(B)Entomophily<br>(D)(C)Hydrophily(D)Anemophily(C)Hydrophily(D)Anemophily46.An example of single cell protein is(B)Volvox<br>(C)(C)Spirulina(B)Volvox<br>(D)Chlamydomonas47.Which forest is named as the "Lungs of the planet"?<br>(A)Western ghats<br>(D)Sahara desert48.The earth summit held at Rio de Janeiro was in the year<br>(A)(B)1902(C)1992(D)199649.Lignified cell wall occurs in<br>(A)(B)Cambial cells<br>(D)(A)Epidermal cells<br>(C)(B)Cambial cells<br>(D)  |     | (A)                 | Cowpea   | (B)            | Wheat                    |
| <ul> <li>44. The stalk of the ovule that attaches it to the placenta in angiosperms is <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> </ul> </li> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>   |     | (C)                 | Brassica   | (D)            | Chilli                   |
| <ul> <li>(A) Pedicel</li> <li>(B) Funiculus</li> <li>(C) Integument</li> <li>(D) Hilum</li> <li>45. Vallisneria usually favours</li> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> <li>46. An example of single cell protein is</li> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> <li>47. Which forest is named as the "Lungs of the planet"?</li> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>49. Lignified cell wall occurs in</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(D) Xylem cells</li> </ul>   | 44. | The st              | alk of the ovule that attaches it to the placent | ta in ai       | ngiosperms is            |
| (C)Integument(D)Hilum45.Vallisneria usually favours(A)Zoophily(B)Entomophily(C)Hydrophily(D)Anemophily46.An example of single cell protein is(A)Spirulina(B)Volvox(C)Spirogyra(D)Chlamydomonas47.Which forest is named as the "Lungs of the planet"?(A)Western ghats(B)(A)Western ghats(B)Eastern ghats(C)Amazon rain forest(D)Sahara desert48.The earth summit held at Rio de Janeiro was in the year<br>(A)(B)1902(C)1992(D)199649.Lignified cell wall occurs in<br>(A)(B)Cambial cells<br>(D)(A)Epidermal cells(B)Cambial cells<br>(D)(D)Phloem cells(D)Xylem cells  |     | (A)                 | Pedicel  | (B)            | Funiculus                |
| <ul> <li>45. Vallisneria usually favours <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> </ul> </li> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | (C)                 | Integument                                       | (D)            | Hilum                    |
| <ul> <li>(A) Zoophily</li> <li>(B) Entomophily</li> <li>(C) Hydrophily</li> <li>(D) Anemophily</li> <li>46. An example of single cell protein is</li> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> <li>47. Which forest is named as the "Lungs of the planet"?</li> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>49. Lignified cell wall occurs in</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(D) Xylem cells</li> </ul>   | 45. | Vallis              | neria usually favours                            |                |                          |
| (C)Hydrophily(D)Anemophily46.An example of single cell protein is(D)Anemophily(A)Spirulina(B)Volvox(C)Spirogyra(D)Chlamydomonas47.Which forest is named as the "Lungs of the planet"?(A)Western ghats(B)(A)Western ghats(B)Eastern ghats(C)Amazon rain forest(D)Sahara desert48.The earth summit held at Rio de Janeiro was in the year(A)1986(A)1986(B)1902(C)1992(D)199649.Lignified cell wall occurs in<br>(A)(B)Cambial cells<br>(D)(A)Epidermal cells(B)Cambial cells(C)Phloem cells(D)Xylem cells   |     | (A)                 | Zoophily   | (B)            | Entomophily              |
| <ul> <li>46. An example of single cell protein is <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> </li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  |     | (C)                 | Hydrophily                                       | (D)            | Anemophily               |
| <ul> <li>(A) Spirulina</li> <li>(B) Volvox</li> <li>(C) Spirogyra</li> <li>(D) Chlamydomonas</li> </ul> 47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> </ul> 48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> 49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>   | 46. | An ex               | ample of single cell protein is                  |                |                          |
| <ul> <li>(f) Spiramina (D) Forton</li> <li>(C) Spirogyra (D) Chlamydomonas</li> <li>47. Which forest is named as the "Lungs of the planet"? <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest (D) Sahara desert</li> </ul> </li> <li>48. The earth summit held at Rio de Janeiro was in the year <ul> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> </ul> </li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>   |     | (A)                 | Spirulina  | (B)            | Volvox                   |
| <ul> <li>47. Which forest is named as the "Lungs of the planet"?</li> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>49. Lignified cell wall occurs in</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>   |     | $(\mathbf{C})$      | Spirogyra  | (D)            | Chlamydomonas            |
| <ul> <li>(A) Western ghats</li> <li>(B) Eastern ghats</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>49. Lignified cell wall occurs in</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>  | 47  | Which               | forest is named as the "Lungs of the planet"     | າ)<br>ທີ       | emainyaomonas            |
| <ul> <li>(A) Westerin glatts</li> <li>(B) Easterin glatts</li> <li>(C) Amazon rain forest</li> <li>(D) Sahara desert</li> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>49. Lignified cell wall occurs in</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>  | 17. | (A)                 | Western ghats                                    | (B)            | Fastern ohats            |
| <ul> <li>48. The earth summit held at Rio de Janeiro was in the year</li> <li>(A) 1986</li> <li>(B) 1902</li> <li>(C) 1992</li> <li>(D) 1996</li> <li>49. Lignified cell wall occurs in</li> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul>   |     | $(\mathbf{\Gamma})$ | Amazon rain forest                               | $(\mathbf{D})$ | Sahara desert            |
| <ul> <li>(A) 1986 (B) 1902</li> <li>(C) 1992 (D) 1996</li> <li>49. Lignified cell wall occurs in <ul> <li>(A) Epidermal cells</li> <li>(B) Cambial cells</li> <li>(C) Phloem cells</li> <li>(D) Xylem cells</li> </ul> </li> </ul>  | 18  | The e               | arth summit held at Rio de Janeiro was in the    | (D)            | Sanara desert            |
| (A)1960(B)1962(C)1992(D)199649.Lignified cell wall occurs in<br>(A)Epidermal cells(B)Cambial cells(C)Phloem cells(D)Xylem cells   | 40. | $(\Delta)$          |  | $(\mathbf{R})$ | 1902                     |
| (C)1992(D)199649.Lignified cell wall occurs in<br>(A)Epidermal cells(B)Cambial cells(C)Phloem cells(D)Xylem cells   |     | (A)                 | 1980   | (D)            | 1902                     |
| 49.Lignified cell wall occurs in<br>(A) Epidermal cells(B) Cambial cells<br>(D) Xylem cells(C) Phloem cells(D) Xylem cells  | 40  | (C)                 | 1992   | (D)            | 1996                     |
| (A)Epidermal cells(B)Cambial cells(C)Phloem cells(D)Xylem cells   | 49. | Lignif              | ied cell wall occurs in                          |                |                          |
| (C) Phloem cells (D) Xylem cells  |     | (A)                 | Epidermal cells                                  | (B)            | Cambial cells            |
|   |     | (C)                 | Phloem cells                                     | (D)            | Xylem cells              |

| 50. | A slide of TS dicot stem shows  |                |                                     |
|-----|---|----------------|-------------------------------------|
|     | (A) Scattered vascular bundles  | (B)            | Vascular bundles arranged in a ring |
|     | (C) Radial vascular bundles   | (D)            | Closed vascular bundles             |
| 51. | Once formed, red blood cells normally have an ave                         | erage l        | ife span of                         |
|     | (A) 30 days   | ( <b>B</b> )   | 60 days                             |
|     | (C) 90 days   | (D)            | 120 days                            |
| 52. | Heparin, an anticoagulant is manufactured by                              |                |                                     |
|     | (A) Plasma cells  | (B)            | Mast cells                          |
|     | (C) Lymphocytes   | (D)            | Blood platelets                     |
| 53. | Function of long bones in mammals is to                                   |                |                                     |
|     | (A) Provide support only  | (B)            | Provide support and production of   |
|     |   |                | RBC only                            |
|     | (C) Provide support and production of WBC                                 | (D)            | Provide support and production of   |
|     | only  |                | RBC and WBC                         |
| 54. | Binocular vision is seen in   |                |                                     |
|     | (A) Man   | (B)            | Rabbit                              |
|     | (C) Rat   | (D)            | Guinea pig                          |
| 55. | Spermatogenesis is influenced by  |                |                                     |
|     | (A) Testosterone  | (B)            | Luteinizing hormone                 |
|     | (C) FSH   | (D)            | All of these                        |
| 56. | The type of respiration found in man is                                   |                |                                     |
|     | (A) Cutaneous   | (B)            | Subcutaneous                        |
|     | (C) Pulmonary   | (D)            | Diffusion                           |
| 57. | What happens if RBCs are put in a hypertonic solu                         | ition          |                                     |
|     | (A) They will contract and loose water                                    | (B)            | They will swell up and burst        |
| -0  | (C) They will show clumping   | (D)            | None of these                       |
| 58. | In man, urea is formed in the   |                |                                     |
|     | (A) Body tissues  | (B)            | Kidney                              |
| 50  | (C) Liver   | (D)            | Spleen                              |
| 59. | Which of the following stood erect first                                  | <b>(D)</b>     | D 1 '                               |
|     | (A) Java man  | (B)            | Peking man                          |
| (0  | (C) Australopitnecus  | (D)            | Cro-Magnon man                      |
| 60. | A) Virging on the earth were  | <b>(D)</b>     | Destaria                            |
|     | (A) Viruses   | (B)            | Bacteria                            |
| 61  | (C) Green algae<br>The 'Use and disuse' principle of evolution was pr     | (D)            | Blue green algae                    |
| 01. | (A) Lamaral   |                | Waiaman                             |
|     | (A) Lamaick<br>(C) Huga da Vrias  | (D)            | Charles Derwin                      |
| 62  | (C) Hugo de viles<br>The following is an example of inhorn error in met   | (D)<br>tabolis | Charles Dai will                    |
| 02. | The following is an example of moon error in met $(\Lambda)$ Spine bifide | (D)            | Dhanylkatonuria                     |
|     | (A) Spina Unida<br>(C) Photometia   | $(\mathbf{D})$ | Mongolism                           |
| 63  | (C) Flocomena<br>Identical twins develop from                             | (D)            | Mongonsm                            |
| 05. | $(\mathbf{A})$ One ovum and two sperms                                    | $(\mathbf{R})$ | Two ova and one sperm               |
|     | (C) Two ova and two sperms  | $(\mathbf{D})$ | None of these                       |
| 64  | The chromosomes are best studied at the following                         | (D)<br>T stage | of mitosis                          |
| 04. | (A) Prophase  | (R)            | Metanhase                           |
|     | $(\mathbf{C})$ Anaphase   | $(\mathbf{D})$ | Telophase                           |
| 65  | A monosomic individual can be mathematically re                           | nresen         | ted as                              |
| 05. | (A) $2n-2$  | (R)            | 2n+1                                |
|     | (C) 2n-1  | (D)            | 2n-4                                |
|     |   | (1)            | <u></u> 11 1                        |

| 66. | In a fruit fly, a white eyed XXY female is mated to a red eyed XY male. The female progeny would be |                |   |
|-----|---|----------------|---|
|     | (A) All red eved  | (B)            | All white eved                                    |
|     | (C) Mainly red eved with a few white eved   | (D)            | Mainly white eved with a few red eved             |
| 67  | One of the following is a sex linked trait in hum:  | ans            |   |
| 07. | (A) Curly hairs   | (B)            | Sickle cell anemia                                |
|     | (C) Colour blindness  | (D)            | Down's syndrome                                   |
| 68  | First experimental evidence for triplet code was  | given by       | ,   |
| 00. | (A) Nirenberg   | (B)            | H G Khorana                                       |
|     | (C) Watson  | (D)            | F.H.C. Crick                                      |
| 69  | Protein coat virus is known as  |                |   |
| 07. | (A) Capsid  | (B)            | Capsomere   |
|     | (C) Virion  | (D)            | Viroid  |
| 70. | Chemically a gene is  |                |   |
|     | (A) Nucleoprotein   | (B)            | Polypeptide                                       |
|     | (C) Ribonucleic acid  | (D)            | Polynucleotide                                    |
| 71. | Apes differ from man in having  |                |   |
|     | (Å) Arms shorter than legs  | (B)            | Legs shorter than arms                            |
|     | (C) Length of arms and legs is similar  | (D)            | A tail  |
| 72. | The disease transmitted through sexual contact is   | S              |   |
|     | (A) Measles   | (B)            | Syphilis  |
|     | (C) Polio   | (D)            | Small pox   |
| 73. | Hypersensitivity of tissue occurs in  |                |   |
|     | (A) Cancer  | (B)            | Malaria   |
|     | (C) Allergy   | (D)            | Small pox   |
| 74. | The sporozoites of malarial parasites are stored i  | in             |   |
|     | (A) Liver of man  | (B)            | Blood of man                                      |
|     | (C) Stomach of females anopheles  | (D)            | Salivary glands of female anopheles               |
| 75. | The following plant has male and female reprodu   | uctive pa      | arts in the same flower                           |
|     | (A) Papaya  | (B)            | Datepalm  |
|     | (C) Cycas   | (D)            | Datura  |
| 76. | Optum is derived from   |                |   |
|     | (A) Latex of <i>Papaver somniferum</i>  | (B)            | Seeds of Papaver somniferum                       |
|     | (C) Seeds of Cojjee arabica   | (D)            | Leaves of datura                                  |
| //. | Penicillium was first isolated from   | <b>(D)</b>     | Denieilling change a survey                       |
|     | (A) Penicillium nigricans<br>(C) Panicillium notatum  | (D)            | Penicillum chrysogenum<br>Penicillum griseofulwum |
| 70  | (C) Tenicilium notatum<br>Which of the following is an implant?                                     | (D)            | 1 enicilium griseojuivum                          |
| /8. | (A) Blood dialyzer  | $(\mathbf{R})$ | Heart value                                       |
|     | (C) Artificial limbs  | (D)            | Oxygenator  |
| 70  | Chemical nature of jute fibre is  | (D)            | Oxygenator  |
| 19. | $(\Lambda)$ Lignin  | (B)            | Cellulose   |
|     | $(\mathbf{C})$ Pectin   | (D)            | Suberin   |
| 80  | The conversion of molecular nitrogen to ammon   | ia is kno      | wn as   |
| 00. | (A) Nitrification   | (B)            | Denitrification                                   |
|     | (C) Ammonification  | (D)            | Nitrogen fixation                                 |
| 81  | Cocaine is a powerful stimulant of  | (2)            |   |
| 01. | (A) Heart beat  | (B)            | Central nervous system                            |
|     | (C) Muscles   | (D)            | Breathing   |
|     |   |                |   |
|     | 5   P C B   | A              |   |

| 82.                 | Diagnosis of typhoid is done by   |                |                         |
|---------------------|---|----------------|-------------------------|
|                     | (A) ESR   | (B)            | ELISA test              |
|                     | (C) DLC   | (D)            | WIDAL test              |
| 83.                 | Scientific study of human population is called  |                |                         |
|                     | (A) Demography  | (B)            | Geography               |
|                     | (C) Anthropology  | (D)            | Biogeography            |
| 84.                 | Vinegar is obtained due to biological activity of   |                |                         |
|                     | (A) Acetobactor   | (B)            | Lactobacillus           |
|                     | (C) Nostoc  | (D)            | Anabaena                |
| 85.                 | The following disease involves change in chromoso   | ome ni         | umber                   |
|                     | (A) Colour blindness  | (B)            | Haemophilia             |
|                     | (C) Down's syndrome   | (D)            | Jaundice                |
| 86.                 | Ringworm disease is caused by   |                |                         |
|                     | (A) Annelid   | (B)            | Helminthes              |
|                     | (C) A fungus  | Ď              | A bacterium             |
| 87.                 | The open type of circulatory system is found in   | ( )            |                         |
|                     | (A) Nereis  | (B)            | Octopus                 |
|                     | (C) Prawn   | (D)            | Frog                    |
| 88.                 | The process of translation is   | ( )            | -0                      |
|                     | (A) Ribosome synthesis  | (B)            | Protein synthesis       |
|                     | (C) DNA synthesis   | Ď              | RNA synthesis           |
| 89                  | Dengue is transmitted by  | (-)            |                         |
| 07.                 | (A) Culex   | (B)            | Male anopheles          |
|                     | (C) Aedes   | (D)            | Female anopheles        |
| 90                  | Young of cockroach is called  | (2)            |                         |
| <i>y</i> 0.         | (A) Ephyra  | (B)            | Nymph                   |
|                     | (C) Maggot  | (D)            | Iuvenile                |
| 91                  | Number of mitotic divisions required to produce 12  | 8 cell         | s from a single cell is |
| <i>,</i>            | (A) 7   | (B)            | 14                      |
|                     | (C) = 16  | (D)            | 32                      |
| 92                  | Distance between two adjacent nitrogen bases of D   | NA is          |                         |
| <i>,</i> <b>_</b> . | (A) $2.4 \text{ A}^{\circ}$   | (B)            | $34 A^{\circ}$          |
|                     | $(C) 24 A^{\circ}$  | (D)            | $34 A^{\circ}$          |
| 93                  | In addition to the nucleus DNA also occurs in   | (D)            | 5111                    |
| 20.                 | (A) Mitochondria  | (B)            | Lysosome                |
|                     | (C) Ribosome  | (D)            | Golgi appratus          |
| 94                  | First photosynthetic organisms to develop on earth  | were           | Solgi upplatas          |
| <i>y</i>            | (A) Bacteria  | (B)            | Diatoms                 |
|                     | (C) Cyanobacteria   | (D)            | Green algae             |
| 95                  | The vector for causing sleening sickness in man is  | (D)            | Green uigue             |
| <i>))</i> .         | (A) House fly   | $(\mathbf{R})$ | Tse-Tse fly             |
|                     | (C) Butterfly   | (D)            | Mosquito                |
| 96                  | Chromosomes are stained with  | (D)            | Mosquito                |
| <i>J</i> 0.         | (A) Saffranine  | $(\mathbf{R})$ | Acetocarmine            |
|                     | $(\mathbf{C})$ Sciff's regent   | $(\mathbf{D})$ | Ethanol                 |
| 97                  | The universal recipient blood group is  | (D)            | L'inditor               |
| )1.                 | $(\Lambda) \qquad \Lambda$  | $(\mathbf{R})$ | ٨B                      |
|                     | $\begin{pmatrix} A \mathbf{y} \\ C \end{pmatrix} = \begin{pmatrix} A \mathbf{y} \\ C \end{pmatrix}$ | (D)            | R                       |
| 98                  | Arsenic pollutant in drinking water causes  | (D)            | D                       |
| <i>J</i> 0.         | (A) Liver and lung diseases   | $(\mathbf{R})$ | Paralysis               |
|                     | (C) Kidney diseases   | (D)            | 1 alalysis<br>Cancer    |
|                     | (C) Klulley diseases  | (D)            | Cancer                  |

| 99.  | In the colony of <i>Apis indica</i> , the one formed b<br>(A) Queen       | by parthenogenesis is<br>(B) Worker                               |
|------|---|---|
|      | (C) Drone   | (D) Both B and C  |
| 100. | The pollutant responsible for chromosomal m                               | utations in man is  |
|      | (A) Lead  | (B) Manganese   |
|      | (C) Arsenic   | (D) Mercury   |
| 101. | While walking on smooth surface one should                                | take small steps to ensure  |
|      | (A) Large friction  | (B) Small friction  |
| 100  | (C) Larger normal force   | (D) Smaller normal force  |
| 102. | What happens to a vehicle travelling in an unit                           | banked curved path if the friction between the road               |
|      | (A) Moves along tangent   | (D) Moves radially in   |
|      | (A) Moves radially out  | (D) Moves along the curve   |
| 103  | (C) Moves faularly out<br>A ball of mass 0.2 kg strikes an obstacle and t | (D) Moves along the curve   |
| 105. | changes from $20 \text{ m/s}$ to $10 \text{ m/s}$ the magnitude of        | of impulse received by the ball isNs                              |
|      | $(A) = 2\sqrt{7}$   | (B) $2\sqrt{2}$   |
|      | $(\Gamma) = 2\sqrt{7}$  | $\begin{array}{c} (D) & 2\sqrt{3} \\ (D) & 2\sqrt{2} \end{array}$ |
| 104  | $(C) 2\sqrt{5}$   | (D) $3\sqrt{2}$   |
| 104. | A spacecraft of mass 2000 kg moving with 60                               | 00 m/s suddenly explodes into two pieces. One piece               |
|      | of mass 500 kg is stationary. The velocity of $(A)$                       | other part in m/s is $(\mathbf{p}) = 800$                         |
|      | (A)  000<br>(C)  1500   | (b) $800$<br>(b) $1000$   |
| 105  | (C) 1500  | (D) 1000  |
| 105. | 16 kg 140 N   | The force on 16 kg is   |
|      |   |   |
|      | - + Kg  |   |
|      | (A) 140N  | (B) $120N$  |
|      | (C) 100N  | $\begin{array}{c} (D) & 12010 \\ (D) & 80N \end{array}$           |
| 106  | A man of mass 40 kg is at rest between the wa                             | alls If coeff of friction between man and wall is                 |
| 100. | 0.8 find the normal reaction exerted by wall of                           | on man (take $g = 10 \text{ m/s/s}$ )                             |
|      | $\bigcirc$  |   |
|      | пҮп   |   |
|      |   |   |
|      |   |   |
|      |   |   |
|      |   |   |
|      | (A) 100 N   | (B) 250 N   |
|      | (C) 80 N  | (D) 50 N  |
| 107. |   |   |
|      |   |   |
|      |   |   |
|      | h   |   |
|      |   |   |
|      |   | <b>&gt;</b>   |
|      | Find minimum height in terms of D to comple                               | ete the loop  |
|      |   |   |
|      | (A) 7D/4  | (B) 9D/4  |
|      | (C) 5D/4  | (D) 3D/4  |
| 108. | Gravitational force between two bodies is F. T                            | The space around the mass is now filled with a                    |
|      | liquid of specific gravity 3. The gravitational $\frac{1}{2}$             | force will be   |
|      | (A) F/9   | (B)  3F   |
|      | (C) F   | (D) F/3   |
|      | <b>7  </b> P C  | B A   |

| 109. | A man weighs 75 kg on the surface of earth. Hi                    | is weight o             | on the geostationary satellite is           |
|------|---|-------------------------|---|
|      | (A) infinity  | (B)                     | 150kg                                       |
|      | (C) zero  | (D)                     | 75/2 kg                                     |
| 110. | g at a depth of 1600 km inside the earth in m/s.                  | /s is                   |   |
|      | (A) 6.65  | (B)                     | 7.35  |
|      | (C) 8.65  | (D)                     | 4.35  |
| 111. | A block of mass 19 M is suspended by a string                     | of length               | 1m. A bullet of mass M hits it and gets     |
|      | embedded in it. If the block completes the vert                   | ical circle             | the velocity of bullet in m/s is            |
|      | (A) 140   | (B)                     | $20\sqrt{19.6}$                             |
|      | (C) $20\sqrt{9.8}$  | (D)                     | 20  |
| 112. | A rubber ball falls from a height of 4m and reb                   | ounds to 1              | .5m. The % loss of energy during the        |
|      | impact is   |                         |   |
|      | (A) 20  | (B)                     | 62.5  |
|      | (C) 23  | (D)                     | 60  |
| 113. | 25 kg of sand is deposited each second on a con                   | nveyor bel              | t moving at 10m/s. The extra power          |
|      | required to maintain the belt in motion is                        |                         |   |
|      | (A) 2600W   | (B)                     | 250W  |
|      | (C) 325W  | (D)                     | 2500W                                       |
| 114. | A uniform rod of mass M and length L standing                     | g verticall             | y on a horizontal floor falls without       |
|      | slipping at the bottom. The moment of inertia v                   | vill be                 | 2   |
|      | $(A) \qquad ML^{2}/3$   | (B)                     | $ML^{2}/6$                                  |
|      | (C) $ML^2/9$  | (D)                     | ML <sup>2</sup> /12                         |
| 115. | If the velocity of C.M of a rolling body is V, th                 | en velocit              | y of highest point in the body will be      |
|      | $(A)  \sqrt{2V}$  | (B)                     | V<br>N/ /2                                  |
| 116  | $\begin{array}{c} (C) & 2V \\ T & 1 \\ \end{array}$               | (D)                     | V/N2  |
| 116. | I he angular momentum of two rotating bodies                      | are equal.              | If the ratio of their M.1 is 1:4, the ratio |
|      | of their fotational K.E is $(A) = 1.2$                            | ( <b>D</b> )            | 2.1   |
|      | (A) 1.2<br>(C) 1.4  | (D)                     | 2.1<br>4·1                                  |
| 117  | (C) 1.4<br>The level of water in a tank is 5m $\Lambda$ hole 1 cm | $^{2}$ is made          | at the bottom. The rate of leakage in $m^3$ |
| 11/. | s is (take $a = 10  m/s/s$ )                                      | 15 maue                 | at the obtion. The fate of feakage in m     |
|      | $(\Delta) = 10^{-3}$  | $(\mathbf{R})$          | 10 <sup>-4</sup>                            |
|      | $(\mathbf{R}) = 10$<br>$(\mathbf{C}) = 10$                        | (D)                     | $10^{-2}$                                   |
| 118  | Two blocks A and B float in water A floats with                   | th $1/4^{\text{th}}$ of | its volume immersed and B floats with       |
| 110. | $3/5^{\text{th}}$ of its volume immersed. The ratio of their      | densities               | is  |
|      | (A) $5.12$  | (B)                     | 12.5  |
|      | (C) 3.20  | (D)                     | 20.3  |
| 119  | The terminal velocity of a spherical ball of lead                 | l of radius             | R is V while falling through a viscous      |
|      | liquid varies with R such that                                    |                         |   |
|      | (A) $V/R$ is constant   | (B)                     | VR is constant                              |
|      | (C) V is constant   | (D)                     | $V/R^2$ is constant                         |
| 120. | A hydraulic press uses a piston of $100 \text{ cm}^2$ to ex       | kert a force            | e of $10^7$ dynes on water. The area of the |
|      | other piston that supports a mass of 2000 kg is                   | (take g = 1)            | 10m/s/s)                                    |
|      | (A) $100 \text{ cm}^2$  | (B)                     | $10^9 \text{ cm}^2$                         |
|      | (C) $2 \times 10^4 \text{ cm}^2$                                  | (D)                     | $2 \times 10^{10} \text{ cm}^2$             |
| 121. | When kerosene and coconut oil of coeff. of vise                   | cosity 0.00             | 02 and 0.0154 $Ns/m^2$ are allowed          |
|      | through the same pipe, under same pressure dif                    | ference ar              | nd same time collects 1 lit of coconut oil. |
|      | The volume of kerosene that flows is                              |                         |   |
|      | (A) 5.5 lit   | (B)                     | 6.6 lit                                     |
|      | (C) 7.7 lit   | (D)                     | 8.8 lit                                     |
|      |   |                         |   |

| 122. | <ul><li>There is a circular hole in metal plate. When the pl</li><li>(A) increased</li><li>(C) unchanged</li></ul>   | <ul><li>ate is heated the radius of the hole becomes</li><li>(B) decreased</li><li>(D) depends on metal</li></ul>   |
|------|--|---|
| 123. | <ul><li>Specific heat of a substance depends on 1. Nature of given to substance</li><li>(A) Only one is correct</li><li>(C) All are correct</li></ul>                  | <ul> <li>(B) Both 1 and 2 are correct</li> <li>(D) Only 1 and 3 are correct</li> </ul>  |
| 124. | <ul> <li>In a give process dW=0, dq is &lt;0 then for a gas</li> <li>(A) Temperature increases</li> <li>(C) Pressure increases</li> </ul>                              | <ul><li>(B) Volume decreases</li><li>(D) Pressure decreases</li></ul>   |
| 125. | <ul><li>The efficiency of carnot engine depends on</li><li>(A) Working substance</li><li>(C) Source temperature</li></ul>  | <ul><li>(B) Sink temperature</li><li>(D) Both B and C</li></ul>   |
| 126. | A 200 turn coil of self inductance 30 mH carries a<br>with each turn of coil.<br>(A) $7.5 \times 10^{-7}$ Wb<br>(C) $3 \times 10^{-7}$ Wb                              | current of 5 mA. Find the magnetic flux linked<br>(B) $1.6 \times 10^{-7}$ Wb<br>(D) $1.5 \times 10^{-7}$ Wb  |
| 127. | The instantaneous value of current in an AC circui<br>time the current will be maximum?<br>(A) 1/100 s<br>(C) 1/500 s  | t is I = 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first<br>(B) 1/200 s<br>(D) 1 s  |
| 128. | What in electric system represents force in mechan<br>(A) L<br>(C) 1/C   | ical system ?<br>(B) I<br>(D) q   |
| 129. | A capacitor of 1 μF is charged with 0.01C of electr<br>(A) 30 J<br>(C) 50 J  | icity. How much energy is stored in it?<br>(B) 40 J<br>(D) 60 J   |
| 130. | An electromagnetic wave is travelling in vacuum v<br>a medium having relative electric and magnetic per<br>(A) $3/\sqrt{2} \times 10^8$ m/s<br>(C) $2 \times 10^8$ m/s | <ul> <li>with a speed of 3 x 10<sup>8</sup> m/s. Find the velocity in rmeability 2 and 1, respectively.</li> <li>(B) 1.5 x 10<sup>8</sup> m/s</li> <li>(D) No change</li> </ul> |
| 131. | Trace the path of ray of light passing through a gla refractive index of glass is $\sqrt{3}$ , find out the value of $60^{-60}$  | ss prism as shown in the figure. If the fangle of emergence from prism.   |
|      | (A) 30<br>(C) 60   | <ul><li>(B) 45</li><li>(D) 75</li></ul>   |
| 132. | Light wave from two coherent sources of intensitie<br>the ratio of maxima and minima of the interference<br>(A) 8:1<br>(C) 9:7   | es in ratio 64:1 produces interference. Calculate<br>pattern.<br>(B) 64:1<br>(D) 81:49  |

| 133. | In young's experiment, the width of the fringes obtained with light of wavelength 6000 $A^{\circ}$ is 2 mm. What will be the fringe width, if the entire apparatus is immersed in a liquid of refractive index 1.33?           |   |  |  |
|------|--|---|--|--|
|      | (A) 1 mm<br>(C) 2 mm   | <ul><li>(B) 1.5 mm</li><li>(D) 2.5 mm</li></ul>   |  |  |
| 134. | Unpolarised light is incident on plane glass surface<br>degrees, so that the reflected and refracted rays are<br>(A) 37<br>(C) 57  | <ul> <li>ce. What should be the angle of incidence in e perpendicular to each other?</li> <li>(B) 47</li> <li>(D) 67</li> </ul> |  |  |
| 135. | Determine the de-Broglie wavelength associated v<br>difference of 100 V.<br>(A) 1.227A°<br>(C) 122.7A°   | <ul> <li>(B) 12.27A°</li> <li>(D) 1227A°</li> </ul>   |  |  |
| 136. | <ul> <li>A particle with rest mass m<sub>0</sub> is moving with veloc associated with it?</li> <li>(A) infinity</li> <li>(C) radio wave</li> </ul>   | <ul><li>ity c. What is the de-Broglie wavelength</li><li>(B) zero</li><li>(D) X ray</li></ul>                                   |  |  |
| 137. | <ul><li>Which among the following series gives visible lig</li><li>(A) Lyman</li><li>(C) Bracket</li></ul>   | ght?<br>(B) Balmer<br>(D) None  |  |  |
| 138. | Identify the logic operation performed by this circ<br>A   |   |  |  |
|      | (A) AND<br>(C) NAND  | <ul><li>(B) OR</li><li>(D) NOR</li></ul>  |  |  |
| 139. | The number of silicon atoms per m <sup>3</sup> is 5 x 10 <sup>28</sup> . The per m <sup>3</sup> of arsenic and 5 x 10 <sup>20</sup> atoms per m <sup>3</sup> of indian <sub>i</sub> = 1.5 x 10 <sup>16</sup> m <sup>-3</sup> . | his is doped simultaneously with 5 x $10^{22}$ atoms<br>ium. Calculate the number of holes, given that                          |  |  |
|      | (A) $4.54 \times 10^{9} \text{m}^{-3}$<br>(C) $1.5 \times 10^{16} \text{m}^{-3}$   | (B) $4.95 \times 10^{22} \text{m}^{-3}$<br>(D) $5 \times 10^{28} \text{m}^{-3}$   |  |  |
| 140. | Two charges $+5\mu C$ and $-5\mu C$ are placed 5 mm apa<br>on the positive charge side along the axial line.<br>(A) 4.5 x 10 <sup>5</sup> N/C<br>(C) 4.5 x 10 <sup>-5</sup> N/C  | art. Determine E at a point 10 cm from centre<br>(B) $4.5 \times 10^{5}$ NC<br>(D) $4.5 \times 10^{-5}$ NC                      |  |  |
| 141. | If the Gaussian surface is so chosen that there are<br>electric field is due to<br>(A) Only inside charges<br>(C) All the charges  | <ul><li>(B) Only outside charges</li><li>(D) Cannot determine</li></ul>   |  |  |

The following is a diagram showing the variation of E with r from centre of uniformly charge 142. spherical shell of radius R



An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 144. 40V self induced emf be produced in the inductor. (A) 2

| (A) | 2s   | (B) | IS    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. 145. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

146.

Find current in the following circuit



| 147. | Two identical circular loops P and Q of radius r are placed in parallel planes with same axis distance of 2r. Find B at the midpoint of the axis between them if same current I flows throu                   |  |                    | ed in parallel planes with same axis at a<br>them if same current I flows through       |
|------|---|--|--------------------|---|
|      | both l  | oops.  |                    | 2/2   |
|      | $(\mathbf{A})$  | $\mu_0 I/2^{3/2} r$  | (B)                | $\mu_0 2I/2^{3/2}r$   |
|      | (C)   | $\mu_0 I/4\pi r$   | (D)                | Cannot be determined  |
| 148. | A blo<br>0.8. If  | ck of mass 4 kg is kept on a rough horizontal<br>f a force of 19 N is applied on the block paral<br>ten the block and floor is:  | surfac<br>lel to t | the coefficient of static friction is<br>the floor, then the force of friction          |
|      | (A)   | 19N  | (B)                | 18 N  |
|      | (C)   | 16N  | (D)                | 9.8N  |
| 149. | Curre   | nt in a circuit falls steadily from 2A to 0A in  | 10 ms              | . Calculate L if emf induced is 200V.   |
|      | (A)   | 1H   | (B)                | 2Н  |
|      | (C)   | 3H   | (D)                | 4H  |
| 150. | Self in core.   | nductance of the air core inductor increases fi<br>What is the relative permeability of the core u   | om 0.0<br>used?    | 01 mH to 10 mH on introducing an iron   |
|      | (A)   | 500  | (B)                | 800   |
|      | (C)   | 900  | (D)                | 1000  |
| 151. | Amor  | ing the following, the most stable complex is $\frac{1}{2}$  | (=)                | 577 (2 177 × 3 <sup>3+</sup>  |
|      | (A)   | $[Fe (H_2O)_6]^3$  | (B)                | $[Fe (NH_3)_6]^{3}$   |
|      | (C)   | $[Fe(C_2O_4)_3]^{\circ}$   | (D)                | $[Fe (Cl)_6]^{\circ}$   |
| 152. | Which<br>metal  | h is the correct coordination number (C.N) an atom in $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?   | nd oxid            | lation number (O.N) of the transition   |
|      | (A)   | C.N=3, O.N=+1  | (B)                | C.N=4, O.N=+2   |
| 1.50 | (C)<br>Tu a a   |  | (D)                |   |
| 155. | In a so   | B occupy one third of the octahedral voids   | t occuj<br>The fo  | rmula of the solid is:  |
|      | (A)   | $ABO_2$  | (B)                | A <sub>2</sub> BO   |
|      | (C)   | AB <sub>3</sub> O  | (D)                | $A_3B_3O_3$   |
| 154. | On m  | ixing acetone to methanol some of the hydrog   | gen bo             | nds between methanol molecules break.   |
|      | Whick   | h of the following statements is correct about   | the ab             | hove process?   |
|      | (A)   | At specific composition methanol acetone   | (B)                | At specific composition methanol  |
|      |   | azeotrope and show positive deviation  |                    | boiling azeotrope and show positive   |
|      |   | from Raoult's law  |                    | deviation from Raoult's law   |
|      | (C)   | At specific composition methanol acetone   | (D)                | At specific composition methanol  |
|      |   | mixture will form minimum boiling  |                    | acetone mixture will form maximum   |
|      |   | azeotrope and show negative deviation  |                    | boiling azeotrope and show negative   |
|      |   | from Raoult's law  |                    | deviation from Raoult's law   |
| 155. | 5. K <sub>H</sub> value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10 and 0.413, respectively. The correct arrangement of these gases in the order of their increasing |  |                    |   |
|      | $(\Lambda)$   | iiiiy is:<br>formaldahyda <mathana<carbon< td=""><td><math>(\mathbf{R})</math></td><td>formaldehyde&lt; carbon dioxide</td></mathana<carbon<>  | $(\mathbf{R})$     | formaldehyde< carbon dioxide  |
|      | (A)   | dioxide <argon< td=""><td>(D)</td><td><methane<argon< td=""></methane<argon<></td></argon<>  | (D)                | <methane<argon< td=""></methane<argon<>   |
|      | (C)   | argon <carbon dioxide<<br="">methane<formaldehyde< td=""><td>(D)</td><td>argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane></td></formaldehyde<></carbon> | (D)                | argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane> |
| 156. | The n   | umber of faradays of electricity required for  | electro            | lytic conversion of the mole of   |
|      | nıtrob  | enzene to aniline is:  |                    | 45  |
|      | (A)<br>(C)  | אר<br>6F   | (D)<br>(B)         | 4r<br>5e  |
|      | $(\mathbf{U})$  | UI   | (D)                | JI  |

| 157. | <ul> <li>The positive value of the standard electrode potential of (A) This redox couple is a stronger reducing (E) agent than H<sup>+</sup>/H<sub>2</sub> couple</li> <li>(C) Ag can displace H<sub>2</sub> from acid (E)</li> </ul>  | <ul> <li>of Ag<sup>+</sup>/Ag indicates that:</li> <li>This redox couple is a stronger oxidizing agent than H<sup>+</sup>/H<sub>2</sub> couple</li> <li>Ag can displace H<sub>2</sub> from base</li> </ul> |  |  |  |
|------|--|--|--|--|--|
| 158. | Milk is refrigerated in order to slow the rate of decompreaction rate is due to:<br>(A) A decrease in surface area (E  | position by bacterial action. The decrease in<br>B) A decrease in $\triangle$ H for the reaction   |  |  |  |
|      | (C) A decrease in the fraction of particles (L<br>possessing sufficient energy   | D) The introduction of an alternative pathway with greater activation energy.  |  |  |  |
| 159. | <ul> <li>Which of the following statements is not correct?</li> <li>(A) The rate of a reaction decreases with passage of time as concentration of reactants decrease</li> </ul>  | 3) The instantaneous rate a reaction is same at any time during the reaction   |  |  |  |
|      | (C) For a zero order reaction the (C) concentration of reactants remains changed with passage of time  | D) The rate of a reaction decreases with increase in concentration of reactant (s)   |  |  |  |
| 160. | Which of the following gases shows the lowest adsorp temperatures are given in parenthesis:  | tion per gram of charcoal? The critical  |  |  |  |
|      | $ \begin{array}{ccc} (A) & H_2 (33K) & (E) \\ (C) & SO_2 (630K) & (E) \end{array} $  | <ul> <li>CH<sub>4</sub>(190K)</li> <li>CO<sub>2</sub>(304K)</li> </ul>   |  |  |  |
| 161. | <ul> <li>Freundlich adsorption isotherm is given by the expression x/m=kp<sup>1/n</sup>. Which of the following statements are false?</li> <li>i. When 1/n=0, the adsorption is independent of pressure.</li> <li>ii. When n=0, the plot of x/m vs p graph is a line parallel to x axis.</li> <li>iii. When 1/n=0, the adsorption is directly proportional to pressure.</li> </ul> |  |  |  |  |
|      | (A) i and ii<br>(C) i and iii (E   | <ul><li>ii and iv</li><li>all are false</li></ul>  |  |  |  |
| 162. | In the extraction of chlorine by electrolysis of an aque<br>the following statements are true?<br>i. $\triangle G^0$ for the overall reaction is positive<br>ii. $\triangle G^0$ for the overall reaction is negative<br>iii. $E^0$ for the overall reaction is positive<br>iv. $E^0$ for the overall reaction is negative   | ous solution of sodium chloride, which of  |  |  |  |
|      | (A)i and iv(E(C)ii and iii(E   | <ul><li>and iii</li><li>iii and iv</li></ul>   |  |  |  |
| 163. | Which of the following pairs of ions are isoelectronic(A) $NO_2^+$ and $NO_3^-$ (E)(C) $XeO_3^{2^-}$ and $PCl_3$ (E)   | and isostructural ?<br>B) $ClO_3^-$ and $ICl_4^-$<br>D) $ClO_3^-$ and $SO_3^{2-}$  |  |  |  |
| 164. | Which of the following hydrides is the strongest reduct $(A)$ $NH_3$ $(E)$ $(C)$ $AsH_3$ $(E)$   | ing agent?<br>B) PH <sub>3</sub><br>D) SbH <sub>3</sub>  |  |  |  |

| 165. | Consider the reactions,<br>i. $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (NO_3)_2 + X + H_2O$<br>ii. $Zn + dil. HNO_3 (cold) \longrightarrow Zn (NO_3)_2 + Y + H_2O$<br>Compounds X and Y are, respectively |   |                        |   |  |
|------|---|---|------------------------|---|--|
|      | (A)<br>(C)  | N <sub>2</sub> O, NO<br>N <sub>2</sub> , N <sub>2</sub> O   | (B)<br>(D)             | NO <sub>2</sub> , NO <sub>2</sub><br>NO <sub>2</sub> , NO   |  |
| 166. | When<br>mang  | KMnO <sub>4</sub> acts as an oxidizing agent in weakly anese decreases by:  | v alkal                | ine medium, the oxidation number of   |  |
|      | (A)<br>(C)  | 1 3   | (B)<br>(D)             | 2<br>5  |  |
| 167. | Acidi<br>forma  | fied potassium dichromate solution turns gree<br>tion of:   | en whe                 | en $Na_2SO_3$ is added to it due to the   |  |
|      | (A)<br>(C)  | CrSO <sub>4</sub><br>CrO <sub>4</sub> <sup>2-</sup>   | (B)<br>(D)             | $Cr_2(SO_4)_3 Cr_2(SO_3)_3$   |  |
| 168. | The d<br>Whick<br>numb  | -electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}a$<br>h one of the following complexes will exhibit<br>ers of Cr=24, Mn=25, Fe=26, Co=27) | nd Co                  | $^{2+}$ are d <sup>4</sup> , d <sup>5</sup> , d <sup>6</sup> and d <sup>7</sup> , respectively.<br>num paramagnetic behavior? (atomic |  |
|      | (A)<br>(C)  | $[Cr(H_2O)_6]^{2^+}$<br>$[Fe(H_2O)_6]^{2^+}$  | (B)<br>(D)             | $\frac{[Mn(H_2O)_6]^{2^+}}{[Co(H_2O)_6]^{2^+}}$   |  |
| 169. | When is:  | 2-Bromopentane is heated with potassium et  | thoxid                 | e in ethanol, the major product obtained  |  |
|      | (A)<br>(C)  | 2-Ethoxypentane<br>Cis-Pent-2-ene   | (B)<br>(D)             | Pent-1-ene<br>Trans-Pent-2-ene  |  |
| 170. | Whick<br>(A)<br>(C)   | h of the following undergoes nucleophilic sub<br>Chloroethane<br>Chlorobenzene  | ostituti<br>(B)<br>(D) | ion exclusively by S <sub>N</sub> <sup>1</sup> mechnism?<br>Isopropyl chloride<br>Benzyl chloride                                     |  |
| 171. | The n<br>(A)<br>(C)   | umber of possible stereoisomers for CH <sub>3</sub> CH=<br>8<br>4   | =CHC<br>(B)<br>(D)     | H <sub>2</sub> CH(Br)CH <sub>3</sub> is:<br>2<br>6  |  |
| 172. | 2-Met   | thoxy-2-methylpropane on heating with HI pr   | oduce                  | s:<br>Mathyliadida and tart butyl alaabal   |  |
|      | $(\mathbf{R})$ $(\mathbf{C})$   | Methyl iodide and isobutene   | (D)                    | Methanol and tet-butyl iodide   |  |
| 173. | The le<br>(A)<br>(C)  | east acidic compound among the following is<br>o-Nitrophenol<br>p-Nitrophenol   | :<br>(B)<br>(D)        | m-Nitrophenol<br>Phenol   |  |
| 174. | An al<br>The k  | kene $C_7H_{14}$ on reductive ozonolysis gives an atom is:  | aldehy                 | vde with formula C <sub>3</sub> H <sub>6</sub> O and a ketone.  |  |
|      | (A)<br>(C)  | 2-Butanone<br>3-Pentanone   | (B)<br>(D)             | 2-Pentanone<br>Propanone  |  |
| 175. | The in<br>Aceto   | ncreasing order of the rate of addition of HCN<br>one iii) Acetophenone iv) benzophenone  | I to th                | e compounds i) Formaldehyde ii)   |  |
|      | (A)<br>(C)  | i <ii <="" iii<="" iv<br="">iv≤iii≤ ii≤ i</ii>  | (B)<br>(D)             | iv< ii< iii < i<br>iv< i< ii< iii   |  |

| 176. | The ca<br>(A)                   | arboxylic acid that does not undergo He<br>CH <sub>3</sub> COOH               | ell-Vohlard-<br>(B)     | Zelinsky reaction is:<br>(CH <sub>3</sub> ) <sub>2</sub> CHCOOH |
|------|---------------------------------|---|-------------------------|---|
|      | (C)                             | CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH                          | (D)                     | (CH <sub>3</sub> ) <sub>3</sub> CCOOH                           |
| 177. | C <sub>2</sub> H <sub>5</sub> N | $NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y \xrightarrow{N} (ex)$ | $H_3 \longrightarrow Z$ |   |
|      | In the (A) (C)                  | above sequence, Z is:<br>cyanoethane<br>methanamine                           | (B)<br>(D)              | ethanamide<br>ethanamine  |
| 178. | The at                          | ttachment of which of the following gro                                       | oup at para r           | position in aniline will raise the $K_{h}$                      |
|      | value<br>(A)<br>(C)             | ?<br>-SO <sub>3</sub> H<br>-F   | (B)<br>(D)              | –OH<br>–Br  |
| 179. | Which                           | n of the following is an example of glob                                      | oular protein           | 1?  |
|      | (A)<br>(C)                      | myosin<br>keratin   | (B)<br>(D)              | collagen<br>haemoglobin   |
| 180. | Which                           | n one of the following is synthesized in                                      | our body by             | y sun rays?   |
|      | (A)<br>(C)                      | Vitamin D<br>Vitamin K  | (B)<br>(D)              | Vitamin B<br>Vitamin A  |
| 181. | Capro                           | lactum is the is the starting material for                                    | the synthes             | sis of  |
|      | (A)<br>(C)                      | Terylene  | (B)<br>(D)              | Nylon 10  |
| 182. | The sp                          | pecies which can serve as an initiator for                                    | or cationic p           | olymerization is  |
|      | (A)<br>(C)                      | Lithium aluminium hydride<br>Aluminium chloride                               | (B)<br>(D)              | Nitric acid<br>BuLi   |
| 183. | Aspiri                          | in is an:   | (7)                     |   |
|      | (A)<br>(C)                      | analgesic<br>antimalarial   | (B)<br>(D)              | antipyretic<br>Both analgesic and antipyretic                   |
| 184. | The e                           | quivalent mass of iron in the reaction 2                                      | $Fe + 3Cl_2 - (P)$      | → 2FeCl <sub>3</sub> is:  |
|      | (A)<br>(C)                      | Same as atomic mass   | (B)<br>(D)              | One fourth of its atomic mass                                   |
| 185. | Which                           | n of the following sets of quantum num  | bers is corre           | ect for an electron in 4f subshell?                             |
|      | (A)<br>(C)                      | n=4, l=3, m=4, s=+1/2<br>n=4, l=3, m=+1, s=+1/2                               | (B)<br>(D)              | n=4, l=3, m=-4, s=-1/2<br>n=3, l=2, m=-2, s=+1/2                |
| 186. | The co                          | orrect sequence of atomic radii is:   |                         |   |
|      | (A)<br>(C)                      | Na>Mg>Al>Si<br>Si>Al>Mg>Na  | (B)<br>(D)              | Al>Si>Al>Na>Mg<br>Si>Al>Na>Mg                                   |
| 187. | In wh                           | ich of the following, the bond angle arc                                      | ound the cen            | tral atom is maximum?   |
|      | (A)<br>(C)                      | NH <sub>3</sub><br>PCl <sub>3</sub>   | (B)<br>(D)              | NH4 <sup>+</sup><br>SCl <sub>2</sub>                            |
| 188. | Which                           | n of the following molecule does not ex                                       | ist                     |   |
|      | (A)<br>(C)                      | NF <sub>3</sub><br>PF <sub>5</sub>  | (B)<br>(D)              | NF5<br>N2H4   |
|      | (-)                             | J   |                         | 24  |

| 189. | If heli                          | um is allowed to expand in vacuum, it liberat  | es hea                          | It is an ideal gas   |
|------|----------------------------------|--|---------------------------------|--|
|      | $(\mathbf{C})$                   | Its critical temp. is low  | (D)<br>(D)                      | It is a light gas  |
| 190. | i) H <sub>2</sub> (g<br>reaction | $g$ ) + 1/2O <sub>2</sub> ( $g$ ) $\rightarrow$ H <sub>2</sub> O(I)+ x KJ ii) H <sub>2</sub> ( $g$ ) + ons,  | 1/2O <sub>2</sub>               | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two   |
|      | (A)<br>(C)                       | x>y<br>x=y   | (B)<br>(D)                      | x <y<br>x+y=0</y<br>   |
| 191. | If the<br>respec<br>(A)<br>(C)   | bond dissociation energies of XY, $X_2$ , $Y_2$ (all<br>ctively and $\Delta_f H$ of XY is -200KJmol <sup>-1</sup> , the box<br>400 KJmol <sup>-1</sup><br>200 KJmol <sup>-1</sup>  | diator<br>nd diss<br>(B)<br>(D) | mic molecules) are in the ratio 1:1:0.5,<br>sociation energy of $X_2$ will be:<br>300 KJmol <sup>-1</sup><br>100 KJmol <sup>-1</sup>   |
| 192. | What<br>among<br>(A)<br>(C)      | will be the correct order of vapour pressure o<br>g these compounds water has maximum boili<br>Water <ether<ethanol<br>Ether<ethanol<water< td=""><td>f wate<br/>ng poi<br/>(B)<br/>(D)</td><td>er, ethanol and ether at 30<sup>o</sup>C? Given that<br/>nt and ether has minimum boiling point.<br/>Water<ethanol<ether<br>Ethanol<ether<water< td=""></ether<water<></ethanol<ether<br></td></ethanol<water<></ether<ethanol<br> | f wate<br>ng poi<br>(B)<br>(D)  | er, ethanol and ether at 30 <sup>o</sup> C? Given that<br>nt and ether has minimum boiling point.<br>Water <ethanol<ether<br>Ethanol<ether<water< td=""></ether<water<></ethanol<ether<br> |
| 193. | Which<br>consta                  | n of the following will occur if a 0.1M solution<br>ant temperature?   | on of a                         | weak acid is diluted to 0.01M at   |
|      | (A) $(C)$                        | Percentage ionization will increase  | (D)                             | $K_a$ will increase  |
| 194. | Which<br>(A)<br>(C)              | n of the following species involves the transfer<br>$MnO_4^{2^-} \rightarrow MnO_4^{-1}$<br>$MnO_4^{-1} \rightarrow MnO_2$   | er of 5<br>(B)<br>(D)           | N <sub>A</sub> electrons per mole of it ?<br>MnO <sub>4</sub> <sup>-</sup> → Mn <sup>2+</sup><br>CrO <sub>4</sub> <sup>2-</sup> →Cr <sup>3+</sup>  |
| 195. | 30-vo<br>(A)                     | lume hyderogen peroxide means:<br>30% H <sub>2</sub> O <sub>2</sub> by volume  | (B)                             | 30g of H <sub>2</sub> O <sub>2</sub> solution containing 1g of it  |
|      | (C)                              | 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ gas at STP   | (D)                             | $30 \text{ cm}^3$ of the solution contains one mole of $H_2O_2$  |
| 196. | The co<br>(A)<br>(C)             | orrect sequence of covalent character is repre<br>LiCl <nacl<becl<sub>2<br/>NaCl<licl< becl<sub="">2</licl<></nacl<becl<sub>   | sented<br>(B)<br>(D)            | l by:<br>BeCl <sub>2</sub> <licl<nacl<br>BeCl<sub>2</sub><nacl< licl<="" td=""></nacl<></licl<nacl<br>   |
| 197. | Which<br>(A)<br>(C)              | h of the following is known as pyrene?<br>$CCl_4$<br>$S_2Cl_2$   | (B)<br>(D)                      | CS <sub>2</sub><br>Solid CO <sub>2</sub>   |
| 198. | The m<br>(A)<br>(C)              | nost stable carbocation amongst the following<br>(CH <sub>3</sub> ) <sub>2</sub> CH <sup>+</sup><br>CH <sub>3</sub> CH <sup>2+</sup>   | (B)<br>(D)                      | $Ph_3C^+$<br>$CH_2=CH-CH_2^+$  |
| 199. | The m<br>(A)<br>(C)              | nolecule that will have dipole moment is:<br>2,2-Dimethylpropane<br>trans-2-Butene   | (B)<br>(D)                      | cis-2-Butene<br>2,2,3,3-Tetramethylbutane  |
| 200. | Of the<br>(A)<br>(C)             | e five isomeric hexanes, the isomer which can<br>2-Methylpentane<br>2,3-Dimethylbutane   | (B)<br>(D)                      | two monochlorinated compound is:<br>2,2-Dimethylbutane<br>n-Hexane   |

| Sr. | Question  |            |                                   |
|-----|---|------------|-----------------------------------|
| No. |   |            |                                   |
| 1.  | Once formed, red blood cells normally have an av $(A) = 20$ days                | verage l   | ife span of                       |
|     | $\begin{array}{ccc} (A) & 30 \text{ days} \\ (C) & 90 \text{ days} \end{array}$ | (B)        | 60 days                           |
| 2   |   | (D)        | 120 uays                          |
| 2.  | Heparin, an anticoagulant is manufactured by                                    | (D)        | Mast calls                        |
|     | (A) Flashia cells<br>(C) Lymphocytes  | (D)        | Blood platelets                   |
| 2   | Eurotion of long honos in mammala is to   | (D)        | blood placets                     |
| 3.  | (A) Provide support only  | (B)        | Provide support and production of |
|     |   | (D)        | RBC only                          |
|     | (C) Provide support and production of WBC                                       | (D)        | Provide support and production of |
|     | only  |            | RBC and WBC                       |
| 4.  | Binocular vision is seen in $(A) = M_{\text{eff}}$                              | <b>(D)</b> | D-11:4                            |
|     | (A) Man<br>(C) Pat  | (B)        | Kabbit<br>Guinea nig              |
| 5   | (C) Nat   | (D)        | Sumea pig                         |
| Э.  | Spermatogenesis is influenced by  |            | T / * * * T                       |
|     | (A) lestosterone<br>(C) ESH   | (B)        | Luteinizing hormone               |
| C   |   | (D)        | All of these                      |
| 6.  | I ne type of respiration found in man is  |            | Seeh and an a see                 |
|     | (A) Cutaneous<br>(C) Pulmonary  | (B)        | Subcutaneous<br>Diffusion         |
| 7   | (C) Pullionary  | (D)        | Diffusion                         |
| 1.  | (A) They will contract and loose water  | ution (P)  | They will swell up and burst      |
|     | (A) They will contract and loose water<br>(C) They will show clumping           | (D)        | None of these                     |
| 0   | In man urap is formed in the  | (D)        | Tone of these                     |
| 0.  | (A) Body tissues  | (R)        | Kidney                            |
|     | (C) Liver   | (D)        | Spleen                            |
| 9   | Which of the following stood erect first  | (2)        | - <b>r</b>                        |
| ۶.  | (A) Java man  | (B)        | Peking man                        |
|     | C Australopithecus  | (D)        | Cro-Magnon man                    |
| 10. | The first autotrophs on the earth were  |            | -                                 |
|     | (A) Viruses   | (B)        | Bacteria                          |
|     | (C) Green algae   | (D)        | Blue green algae                  |
| 11. | The 'Use and disuse' principle of evolution was p                               | ropose     | d by                              |
|     | (A) Lamarck   | (B)        | Weisman                           |
|     | (C) Hugo de Vries   | (D)        | Charles Darwin                    |
| 12. | The following is an example of inborn error in me                               | etabolis   | m                                 |
|     | (A) Spina bifida  | (B)        | Phenylketonuria                   |
|     | (C) Phocomelia  | (D)        | Mongolism                         |
| 13. | Identical twins develop from  |            |                                   |
|     | (A) One ovum and two sperms   | (B)        | Two ova and one sperm             |
|     | (C) Two ova and two sperms  | (D)        | None of these                     |
| 14. | The chromosomes are best studied at the followin                                | ig stage   | of mitosis                        |
|     | (A) Prophase  | (B)        | Metaphase                         |
|     | (C) Anapnase  | (D)        | reiopnase                         |

| 15. A monosomic individual can be mathematically represented as |                   |  | ted as            |                                       |
|---|-------------------|--|-------------------|---------------------------------------|
|   | (A)               | 2n-2   | (B)               | 2n+1                                  |
|   | (C)               | 2n-1   | (D)               | 2n-4                                  |
| 16.   | In a fr           | ruit fly, a white eyed XXY female is mated to    | a red             | eyed XY male. The female progeny      |
|   | would             | l be   |                   |                                       |
|   | (A)               | All red eyed                                     | (B)               | All white eyed                        |
|   | (C)               | Mainly red eyed with a few white eyed            | (D)               | Mainly white eyed with a few red eyed |
| 17.   | One o             | of the following is a sex linked trait in humans | 5                 |                                       |
|   | (A)               | Curly hairs                                      | (B)               | Sickle cell anemia                    |
|   | (C)               | Colour blindness                                 | (D)               | Down's syndrome                       |
| 18.   | First e           | experimental evidence for triplet code was give  | en by             |                                       |
|   | (A)               | Nirenberg  | (B)               | H.G. Khorana                          |
|   | (C)               | Watson   | (D)               | F.H.C. Crick                          |
| 19.   | Protei            | n coat virus is known as                         |                   |                                       |
|   | (A)               | Capsid   | (B)               | Capsomere                             |
|   | (C)               | Virion   | (D)               | Viroid                                |
| 20.   | Chem              | ically a gene is                                 |                   |                                       |
|   | (A)               | Nucleoprotein                                    | (B)               | Polypeptide                           |
|   | (C)               | Ribonucleic acid                                 | (D)               | Polynucleotide                        |
| 21.   | Apes              | differ from man in having                        |                   |                                       |
|   | (A)               | Arms shorter than legs                           | (B)               | Legs shorter than arms                |
|   | (C)               | Length of arms and legs is similar               | (D)               | A tail                                |
| 22.   | The d             | isease transmitted through sexual contact is     | ( <b>T</b> )      | ~                                     |
|   | (A)               | Measles  | (B)               | Syphilis                              |
| ••  | (C)               | Polio  | (D)               | Small pox                             |
| 23.   | Hyper             | rsensitivity of tissue occurs in                 |                   |                                       |
|   | (A)               | Cancer   | (B)               | Malaria                               |
| 2.4   | (C)               | Allergy  | (D)               | Small pox                             |
| 24.   | I he s            | porozoites of malarial parasites are stored in   | <b>(D)</b>        | Dischaftman                           |
|   | (A)               | Liver of man                                     | (B)               | Blood of man                          |
| 25  | (C)<br>The f      | Stomach of females anopheles                     | (D)               | Salivary glands of female anopheles   |
| 25.   | $(\Lambda)$       | Dirowing plant has male and remaie reproduct     | $(\mathbf{D})$    | Detensime nower                       |
|   | (A)               | Papaya   | (D)               | Datepain                              |
| 26  | (C)               | Cycas<br>n is derived from                       | (D)               | Datula                                |
| 20.   | $(\Lambda)$       | I stev of Panavar somnifarum                     | $(\mathbf{B})$    | Seeds of Panavar somniforum           |
|   | $(\mathbf{A})$    | Seeds of Coffee arabica                          | $(\mathbf{D})$    | Leaves of datura                      |
| 27  | (C)<br>Ponic      | illium was first isolated from                   | (D)               |                                       |
| 21.   | (A)               | Penicillium nigricans                            | (B)               | Penicillium chrysogenum               |
|   | $(\mathbf{C})$    | Penicillium notatum                              | (D)               | Penicillum griseofulvum               |
| 28  | Whiel             | h of the following is an implant?                | (D)               | 1 ententian griscojatvan              |
| 20.   | (A)               | Blood diasyser                                   | (B)               | Heart valve                           |
|   | $(\mathbf{C})$    | Artificial limbs                                 | (D)               | Oxygenator                            |
| 29  | Chem              | ical nature of jute fibre is                     | (2)               | Shygenator                            |
| _/.   | (A)               | Lignin   | (B)               | Cellulose                             |
|   | (C)               | Pectin   | (D)               | Suberin                               |
| 30.   | The c             | onversion of molecular nitrogen to ammonia       | is kno            | wn as                                 |
|   | (A)               | Nitrification                                    | (B)               | Denitrification                       |
|   | (C)               | Ammonification                                   | Ď                 | Nitrogen fixation                     |
|   | $\langle \rangle$ |  | $\langle \rangle$ | 5                                     |

| 31. | Cocai   | ne is a powerful stimulant of              |                |                        |  |  |
|-----|---|--|----------------|------------------------|--|--|
|     | (A)   | Heart beat                                 | (B)            | Central nervous system |  |  |
|     | (C)   | Muscles                                    | (D)            | Breathing              |  |  |
| 32. | Diagr   | nosis of typhoid is done by                |                |                        |  |  |
|     | (A)   | ESR  | (B)            | ELISA test             |  |  |
|     | (C)   | DLC  | (D)            | WIDAL test             |  |  |
| 33. | Scien   | tific study of human population is called  |                |                        |  |  |
|     | (A)   | Demography                                 | (B)            | Geography              |  |  |
|     | (C)   | Anthropology                               | (D)            | Biogeography           |  |  |
| 34. | Vinegar is obtained due to biological activity of                               |  |                |                        |  |  |
|     | (A)   | Acetobactor                                | (B)            | Lactobacillus          |  |  |
|     | (C)   | Nostoc                                     | (D)            | Anabaena               |  |  |
| 35. | The fe  | ollowing disease involves change in chrome | osome n        | umber                  |  |  |
|     | (A)   | Colour blindness                           | (B)            | Haemophilia            |  |  |
|     | (C)   | Down's syndrome                            | (D)            | Jaundice               |  |  |
| 36. | Ringv   | vorm disease is caused by                  |                |                        |  |  |
|     | (A)   | Annelid                                    | (B)            | Helminthes             |  |  |
|     | (C)   | A fungus                                   | (D)            | A bacterium            |  |  |
| 37. | The o   | pen type of circulatory system is found in |                |                        |  |  |
|     | (A)   | Nereis                                     | (B)            | Octopus                |  |  |
|     | (C)   | Prawn                                      | (D)            | Frog                   |  |  |
| 38. | The p   | rocess of translation is                   |                |                        |  |  |
|     | (A)   | Ribosome synthesis                         | (B)            | Protein synthesis      |  |  |
|     | (C)   | DNA synthesis                              | (D)            | RNA synthesis          |  |  |
| 39. | Deng  | ue is transmitted by                       |                |                        |  |  |
|     | (A)   | Culex                                      | (B)            | Male anopheles         |  |  |
|     | (C)   | Aedes                                      | (D)            | Female anopheles       |  |  |
| 40. | Youn  | g of cockroach is called                   |                |                        |  |  |
|     | (A)   | Ephyra                                     | (B)            | Nymph                  |  |  |
|     | (C)   | Maggot                                     | (D)            | Juvenile               |  |  |
| 41. | Number of mitotic divisions required to produce 128 cells from a single cell is |  |                |                        |  |  |
|     | (A)   |  | (B)            | 14                     |  |  |
|     | (C)   | 16   | (D)            | 32                     |  |  |
| 42. | Distance between two adjacent nitrogen bases of DNA is                          |  |                |                        |  |  |
|     | (A)   | 2.4 A <sup>o</sup>                         | (B)            | 3.4 A <sup>o</sup>     |  |  |
|     | $(\mathbf{C})$  | 24 Δ <sup>0</sup>                          | $(\mathbf{D})$ | 34 A <sup>o</sup>      |  |  |
| 10  | (0)   |  | (D)            | J 7 1 1                |  |  |
| 43. | In add  | dition to the nucleus, DNA also occurs in  |                | т                      |  |  |
|     | (A)   | Mitochondria                               | (B)            | Lysosome               |  |  |
|     | (C)   | Ribosome                                   | (D)            | Golgi appratus         |  |  |
| 44. | First   | photosynthetic organisms to develop on ear | th were        | D' /                   |  |  |
|     | (A)   | Bacteria                                   | (B)            | Diatoms                |  |  |
|     | (C)   | Cyanobacteria                              | . (D)          | Green algae            |  |  |
| 45. | The v   | ector for causing sleeping sickness in man | 1S             | т т ( <b>1</b>         |  |  |
|     | (A)   | House fly                                  | (B)            | I se-I se IIy          |  |  |
| 10  | $(\mathbf{U})$  |  | (D)            | wosquito               |  |  |
| 40. | Unromosomes are stained with  |  |                |                        |  |  |
|     | (A)   | Saffranine                                 | (B)            | Acetocarmine           |  |  |
|     | (C)   | Sciff's reagent                            | (D)            | Ethanol                |  |  |

| 47. | The universal recipient blood group is (A) A  | (B) AB   |
|-----|---|--|
|     | (C) O   | (D) B  |
| 48. | Arsenic pollutant in drinking water causes  |  |
|     | (A) Liver and lung diseases   | (B) Paralysis  |
|     | (C) Kidney diseases   | (D) Cancer   |
| 49. | In the colony of Apis indica, the one formed  | d by parthenogenesis is  |
|     | (A) Queen   | (B) Worker   |
|     | (C) Drone   | (D) Both B and C   |
| 50. | The pollutant responsible for chromosomal   | mutations in man is  |
|     | (A) Lead  | (B) Manganese  |
|     | (C) Arsenic   | (D) Mercury  |
| 51. | While walking on smooth surface one should  | ld take small steps to ensure  |
|     | (A) Large friction  | (B) Small friction   |
|     | (C) Larger normal force   | (D) Smaller normal force   |
| 52. | What happens to a vehicle travelling in an u and tires suddenly disappears                                    | inbanked curved path if the friction between the road  |
|     | (A) Moves along tangent   | (B) Moves radially in  |
|     | (C) Moves radially out  | (D) Moves along the curve  |
| 53. | A ball of mass 0.2 kg strikes an obstacle and<br>changes from 20m/s to 10m/s the magnitude<br>(A) $2\sqrt{2}$ | d moves at $60^{\circ}$ to its initial direction. If its speed<br>e of impulse received by the ball isNs |
|     | $(\mathbf{A})  \underline{2}\sqrt{7}$   | (D) $2\sqrt{3}$  |
|     | $(C) = 2\sqrt{5}$   | $(D)  3\sqrt{2}$   |
| 54. | A spacecraft of mass 2000 kg moving with<br>of mass 500 kg is stationary. The velocity o                      | 600  m/s suddenly explodes into two pieces. One piece f other part in m/s is                             |
|     | (A) $600$<br>(C) $1500$   | (B) 800<br>(D) 1000  |
|     | (C) 1500  | (D) 1000   |
| 55. | 16 kg 8 kg 4 kg 4 kg  | The force on 16 kg is  |
|     | (A) 140N  | (B) 120N   |
|     | $(\mathbf{C})  100\mathbf{N}$   | $\begin{array}{c} (D) & 12010 \\ (D) & 80N \end{array}$  |
| 56. | A man of mass 40 kg is at rest between the 0.8, find the normal reaction exerted by wal                       | walls. If coeff. of friction between man and wall is<br>ll on man (take $g = 10 \text{ m/s/s}$ )         |
|     |   |  |



| 57. | h  |  |  |
|-----|--|--|--|
|     | Find minimum height in terms of D to cor   | nplete the loop                              |  |
|     | (A) $7D/4$<br>(C) $5D/4$   | (B)<br>(D)                                   | 9D/4<br>3D/4                                     |
| 58. | Gravitational force between two bodies is liquid of specific gravity 3. The gravitatio $(A) = F/9$ | F. The space an nal force will be            | round the mass is now filled with a<br>e<br>3F   |
|     | $\begin{array}{ccc} (R) & R \\ (C) & F \end{array}$  | (D)<br>(D)                                   | F/3  |
| 59. | A man weighs 75 kg on the surface of eart<br>(A) infinity  | th. His weight c<br>(B)                      | on the geostationary satellite is<br>150kg       |
| 60  | (C) zero<br>g at a depth of 1600 km inside the earth in  | (D)  | /5/2 Kg  |
| 00. | (A) $6.65$   | (B)  | 7.35   |
|     | (C) 8.65   | (D)  | 4.35   |
| 61. | A block of mass 19 M is suspended by a s   | tring of length                              | 1m. A bullet of mass M hits it and gets          |
|     | embedded in it. If the block completes the $(A)$ 140   | e vertical circle                            | the velocity of bullet in m/s is $\frac{1}{100}$ |
|     | (A)  140   | (В)<br>(D)                                   | 20√19.6<br>20                                    |
| 62  | (C) $20\sqrt{9.8}$   | (D)<br>d rehounds to 1                       | 5m The % loss of energy during the               |
| 02. | impact is  |  | .5m. The 78 loss of energy during the            |
|     | (A) 20   | (B)  | 62.5   |
|     | (C) 23   | (D)  | 60   |
| 63. | 25 kg of sand is deposited each second on  | a conveyor bel                               | t moving at 10m/s. The extra power               |
|     | required to maintain the belt in motion is   |  | • • • • • • •                                    |
|     | (A) $2600W$<br>(C) $225W$  | (B)  | 250W   |
| 64  | (C) 525 W<br>A uniform rod of mass M and length L sta  | (D)<br>nding vertically                      | 2500 w   |
| 04. | slipping at the bottom. The moment of ine  | rtia will be                                 | y on a nonzontal noor fails without              |
|     | (A) $ML^2/3$   | (B)  | $ML^2/6$   |
|     | (C) $ML^{2}/9$   | (D)  | $ML^2/12$  |
| 65. | If the velocity of C.M of a rolling body is  | V, then velocity                             | y of highest point in the body will be           |
|     | $(A)  \sqrt{2V}$   | (B)  | V<br>N/ /2                                       |
|     | (C) = 2V   | (D)  |  |
| 66. | The angular momentum of two rotating be<br>of their rotational K.E is $(A) = 1.2$                  | dies are equal.                              | If the ratio of their M.I is 1:4, the ratio      |
|     | (A) 1.2<br>(C) 1.4   | (В)<br>(D)                                   | 2.1<br>4·1                                       |
| 67  | The level of water in a tank is 5m. A hole   | $1 \text{ cm}^2$ is made                     | at the bottom. The rate of leakage in $m^3$      |
| 07. | /s is (take $g=10 \text{ m/s/s}$ )   | i elli is inude i                            |  |
|     | (A) $10^{-3}$  | (B)  | 10 <sup>-4</sup>                                 |
|     | (C) 10   | (D)  | 10 <sup>-2</sup>                                 |
| 68. | Two blocks A and B float in water. A float $3/5^{\text{th}}$ of its volume immersed. The ratio of  | ts with 1/4 <sup>th</sup> of their densities | its volume immersed and B floats with is         |
|     | (A) 5:12   | (B)  | 12:5   |
|     | (C) 3:20   | (D)  | 20:3   |

| 69.  | The terminal velocity of a spherical ball of lead of radius R is Vwhile falling through a vi             |  |           | R is Vwhile falling through a viscous               |  |  |
|--|--|--|-----------|---|--|--|
|  |  |  |           |   |  |  |
|  | (A)  | V/R is constant  | (B)       | VR is constant                                      |  |  |
|  | (C)  | V is constant  | (D)       | $V/R^2$ is constant                                 |  |  |
| 70.  | A hyd  | lraulic press uses a piston of 100 cm <sup>2</sup> to exert  | a force   | e of $10^7$ dynes on water. The area of the         |  |  |
| other piston that supports a mass of 2000 kg is (take $g = 10 \text{ m/s/s}$ ) |  |  |           | 10m/s/s)  |  |  |
|  | (A)  | $100 \mathrm{cm}^2$  | (B)       | $10^9  {\rm cm}^2$                                  |  |  |
|  | (C)  | $2 \times 10^4 \text{ cm}^2$   | (D)       | $2 \times 10^{10} \text{ cm}^2$                     |  |  |
| 71.  | When   | kerosene and coconut oil of coeff. of vis  | scosity   | v 0.002 and 0.0154 Ns/m <sup>2</sup> are allowed    |  |  |
|  | throug   | through the same pipe, under same pressure difference and same time collects 1 lit of coconut oil. |           |   |  |  |
|  | The v  | olume of kerosene that flows is  |           |   |  |  |
|  | (A)  | 5.5 lit  | (B)       | 6.6 lit   |  |  |
|  | (C)  | 7.7 lit  | (D)       | 8.8 lit   |  |  |
| 72.  | There  | is a circular hole in metal plate. When the pl   | ate is l  | neated the radius of the hole becomes               |  |  |
|  | (A)  | increased  | (B)       | decreased   |  |  |
|  | (C)  | unchanged  | (D)       | depends on metal                                    |  |  |
| 73.  | Speci  | fic heat of a substance depends on 1. Nature of  | of subs   | stance. 2. Mass of substance. 3. Heat               |  |  |
|  | given  | to substance   |           |   |  |  |
|  | (A)  | Only one is correct  | (B)       | Both 1 and 2 are correct                            |  |  |
|  | (C)  | All are correct  | (D)       | Only 1 and 3 are correct                            |  |  |
| 74.  | In a g   | ive process dW=0, dq is <0 then for a gas  |           |   |  |  |
|  | (A)  | Temperature increases  | (B)       | Volume decreases                                    |  |  |
|  | (C)  | Pressure increases   | (D)       | Pressure decreases                                  |  |  |
| 75.  | The efficiency of carnot engine depends on   |  |           |   |  |  |
|  | (A)  | Working substance  | (B)       | Sink temperature                                    |  |  |
|  | (C)  | Source temperature   | (D)       | Both B and C  |  |  |
| 76.  | A 200  | ) turn coil of self inductance 30 mH carries a   | curren    | t of 5 mA. Find the magnetic flux linked            |  |  |
|  | with e   | each turn of coil.   | <i></i> . |   |  |  |
|  | (A)  | $7.5 \times 10^{-9} \text{Wb}$   | (B)       | 1.6 x 10 <sup>-7</sup> Wb                           |  |  |
|  | (C)  | 3 x 10 <sup>-7</sup> Wb  | (D)       | 1.5 x 10 <sup>-7</sup> Wb                           |  |  |
| 77.  | The instantaneous value of current in an AC circuit is $I = 2 \sin (100 \pi t + \pi/3)$ A. At what first |  |           |   |  |  |
|  | time t   | the current will be maximum?   |           | 1/200   |  |  |
|  | (A)  | 1/100 s  | (B)       | 1/200 s   |  |  |
| -  | (C)  | 1/500 s  | (D)       | ls  |  |  |
| 78.  | What   | in electric system represents force in mechan  | ical sy   | vstem ?   |  |  |
|  | (A)  |  | (B)       | 1   |  |  |
| -  | (C)  |  | (D)       | q   |  |  |
| 79.  | A cap  | pacitor of 1 $\mu$ F is charged with 0.01C of electr   | TCITY.    | How much energy is stored in it?                    |  |  |
|  | (A)  | 30 J   | (B)       | 40 J  |  |  |
|  | (C)  | 50 J   | (D)       | 60 J  |  |  |
| 80.  | An el  | ectromagnetic wave is travelling in vacuum w   | with a s  | speed of 3 x $10^{\circ}$ m/s. Find the velocity in |  |  |
|  | a medium having relative electric and magnetic permeability 2 and 1, respectively.                       |  |           |   |  |  |
|  | (A)  | $3/\sqrt{2} \times 10^{\circ} \text{m/s}$  | (B)       | 1.5 x 10°m/s  |  |  |
|  | (C)  | 2 x 10°m/s   | (D)       | No change   |  |  |

81. Trace the path of ray of light passing through a glass prism as shown in the figure. If the refractive index of glass is  $\sqrt{3}$ , find out the value of angle of emergence from prism.

|     | 60   |  |   |
|-----|--|--|---|
|     | (A) 30<br>(C) 60   | (B)<br>(D)   | 45<br>75  |
| 82. | Light wave from two coherent sour<br>the ratio of maxima and minima of   | rces of intensities in rational terms in the interference patter           | tio 64:1 produces interference. Calculate rn.   |
|     | (A) 8:1<br>(C) 9:7   | (B)<br>(D)   | 64:1<br>81:49   |
| 83. | In young's experiment, the width of mm. What will be the fringe width index 1.33?  | of the fringes obtained<br>, if the entire apparatu                        | with light of wavelength 6000 A° is 2<br>s is immersed in a liquid of refractive      |
|     | (A) 1 mm   | (B)  | 1.5 mm  |
|     | (C) 2 mm   | (D)  | 2.5 mm  |
| 84. | Unpolarised light is incident on pl<br>degrees, so that the reflected and re   | ane glass surface. What<br>efracted rays are perpe                         | at should be the angle of incidence in ndicular to each other?                        |
|     | (A) 37   | (B)  | 47  |
| 0.5 | (C) 57   | (D)  | 6/  |
| 85. | difference of 100 V.   | gth associated with an   | electron, accelerated through a potential   |
|     | (A) $1.227A^{\circ}$   | (B)  | 12.27Ű  |
| 0.6 | (C) 122.7A   | (D)  |   |
| 86. | A particle with rest mass $m_0$ is mov associated with it?   | ving with velocity c. V  | vhat is the de-Broglie wavelength   |
|     | (A) infinity   | (B)  | zero  |
| ~-  | (C) radio wave   | (D)  | X ray   |
| 87. | Which among the following series   | gives visible light?   | Dalmar  |
|     | (A) Lyman<br>(C) Bracket   | (B)<br>(D)   | None  |
| 00  | Identify the logic operation perform   | (D)  | None  |
| 00. | A  | ned by this circuit  |   |
|     |  |  | )   |
|     |  |  |   |
|     |  |  | OD  |
|     | (A) AND<br>(C) NAND  | (B)<br>(D)   | OK<br>NOR   |
| 89. | The number of silicon atoms per m<br>per m <sup>3</sup> of arsenic and 5 x $10^{20}$ atom<br>$n = 1.5 \times 10^{16} m^{-3}$ | $h^3$ is 5 x $10^{28}$ . This is do<br>as per m <sup>3</sup> of indium. Ca | oped simultaneously with 5 x $10^{22}$ atoms alculate the number of holes, given that |
|     | $(\Lambda) = \frac{1.5 \times 10^{10} \text{ m}^{-3}}{10^{9} \text{m}^{-3}}$   | ( <b>B</b> )   | $4.95 \times 10^{22} \text{m}^{-3}$   |

- 90. Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre on the positive charge side along the axial line.
  - (A)  $4.5 \times 10^{5}$ N/C (B)  $4.5 \times 10^{5}$ N/C (D)  $4.5 \times 10^{-5}$ NC
- 91. If the Gaussian surface is so chosen that there are some charges inside and some outside then the electric field is due to
  - (A) Only inside charges

(B) Only outside charges

(C) All the charges

- (D) Cannot determine
- 92. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



R



93. Net capacitance of 3 identical capacitor in series is 1  $\mu$ *F*.What is the net capacitance in  $\mu$ *F* if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

r

94. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

95. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

Find current in the following circuit 2Ω 1Ω 4Ω 5Ω 2Ω (A) 1A (B) 2A 3A (D) 4A (C) 97. Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find B at the midpoint of the axis between them if same current I flows through both loops.  $\mu_0 I/2^{3/2} r$ (B)  $\mu_0 2I/2^{3/2}r$ (A) (D) Cannot be determined (C)  $\mu_0 I/4\pi r$ A block of mass 4 kg is kept on a rough horizontal surface. The coefficient of static friction is 98. 0.8. If a force of 19 N is applied on the block parallel to the floor, then the force of friction between the block and floor is: (A) 19N **(B)** 18 N (C) 16N (D) 9.8N 99. Current in a circuit falls steadily from 2A to 0A in 10 ms. Calculate L if emf induced is 200V. (A) 1H**(B)** 2H(C) 3H (D) 4H Self inductance of the air core inductor increases from 0.01 mH to 10 mH on introducing an iron 100. core. What is the relative permeability of the core used? (A) 500 **(B)** 800 (C) 900 (D) 1000 101. Among the following, the most stable complex is  $[Fe (H_2O)_6]^{3+}$  $[Fe (C_2O_4)_3]^{3-}$  $[Fe (NH_3)_6]^{3+}$ (A) (B) (D)  $[Fe (Cl)_6]^3$ (C) 102. Which is the correct coordination number (C.N) and oxidation number (O.N) of the transition metal atom in  $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ? C.N=3, O.N=+1 (B) C.N=4, O.N=+2(A) C.N=6, O.N=+1 (D) C.N=6, O.N=+3 (C) 103. In a solid, oxide ions are arranged in ccp, cations A occupy one sixth of the tetrahedral voids and cation B occupy one third of the octahedral voids. The formula of the solid is: ABO<sub>3</sub> (A) (B) A<sub>3</sub>BO AB<sub>3</sub>O (C) (D)  $A_3B_3O_3$ 

96.

- 104. On mixing acetone to methanol some of the hydrogen bonds between methanol molecules break. Which of the following statements is correct about the above process?
  - (A) At specific composition methanol acetone mixture will form minimum boiling azeotrope and show positive deviation from Raoult's law
  - (C) At specific composition methanol acetone mixture will form minimum boiling azeotrope and show negative deviation from Raoult's law
- At specific composition methanol (B) acetone mixture will form maximum boiling azeotrope and show positive deviation from Raoult's law
- (D) At specific composition methanol acetone mixture will form maximum boiling azeotrope and show negative deviation from Raoult's law

formaldehyde< carbon dioxide

- 105.  $K_{\rm H}$  value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10<sup>-5</sup> and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is:
  - (A) formaldehyde<methane<carbon dioxide<argon
    - <methane<argon (D)

(D)

**(B)** 

- argon<carbon dioxide< (C) methane<formaldehyde
- argon <methane <carbon dioxide <formaldehvde
- 106. The number of faradays of electricity required for electrolytic conversion of the mole of nitrobenzene to aniline is:
  - (A) 3F 4F (B)
  - (C) 6F (D) 5F
- 107. The positive value of the standard electrode potential of  $Ag^+/Ag$  indicates that: **(B)** This redox couple is a stronger
  - (A) This redox couple is a stronger reducing agent than  $H^+/H_2$  couple
  - Ag can displace H<sub>2</sub> from acid (C)
- Ag can displace  $H_2$  from base Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The decrease in 108. reaction rate is due to:
  - (A) A decrease in surface area
  - A decrease in the fraction of particles (C) possessing sufficient energy
- 109. Which of the following statements is not correct?
  - The rate of a reaction decreases with (A) passage of time as concentration of reactants decrease
  - (C) For a zero order reaction the concentration of reactants remains changed with passage of time

- (B) A decrease in  $\triangle$  H for the reaction
- The introduction of an alternative (D) pathway with greater activation energy.

oxidizing agent than  $H^+/H_2$  couple

- **(B)** The instantaneous rate a reaction is same at any time during the reaction
- (D) The rate of a reaction decreases with increase in concentration of reactant (s)
- 110. Which of the following gases shows the lowest adsorption per gram of charcoal? The critical temperatures are given in parenthesis:
  - (A) H<sub>2</sub> (33K) (B) CH<sub>4</sub>(190K) (D)  $CO_2(304K)$ (C) SO<sub>2</sub>(630K)
- Freundlich adsorption isotherm is given by the expression  $x/m=kp^{1/n}$ . Which of the following 111. statements are false?
  - When 1/n=0, the adsorption is independent of pressure. i.
  - ii. When n=0, the plot of x/m vs p graph is a line parallel to x axis.
  - When 1/n=0, the adsorption is directly proportional to pressure. iii.
  - When n=0, plot of x/m vs p is a curve iv.
  - i and ii (B) ii and iv (A)
  - (C) i and iii
- (D) all are false

| 112. | In the extraction of chlorine by electrolysis of an aqueous solution of sodium chloride, which of the following statements are true? |   |              |   |  |  |  |
|------|--|---|--------------|---|--|--|--|
|      | i. $\Delta G^0$ for the overall reaction is positive   |   |              |   |  |  |  |
|      | ii   | $\Delta G^0$ for the overall reaction is negative             | ve           |   |  |  |  |
|      | iii  | $E^0$ for the overall reaction is positive                    |              |   |  |  |  |
|      | iv   | $E^0$ for the overall reaction is negative                    |              |   |  |  |  |
|      | (A)  | i and iv  | (B)          | i and iii                               |  |  |  |
|      | (C)  | ii and iii  | (D)          | iii and iv                              |  |  |  |
| 113. | Whic   | n of the following pairs of ions are isoelectro               | nic and      | d isostructural?                        |  |  |  |
|      | (A)  | $NO_2^+$ and $NO_3^-$   | (B)          | $ClO_3^-$ and $ICl_4^-$                 |  |  |  |
|      | (C)  | $XeO_3^{2-}$ and $PCl_3$                                      | (D)          | $\text{ClO}_3^-$ and $\text{SO}_3^{2-}$ |  |  |  |
| 114. | Whicl  | n of the following hydrides is the strongest re               | ducing       | g agent?                                |  |  |  |
|      | (A)  | NH <sub>3</sub>   | (B)          | PH <sub>3</sub>                         |  |  |  |
|      | (C)  | AsH <sub>3</sub>  | (D)          | SbH <sub>3</sub>                        |  |  |  |
| 115. | Consi  | der the reactions,  |              |   |  |  |  |
|      | i.   | $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (N)$               | $(O_3)_2 +$  | $+X + H_2O$                             |  |  |  |
|      | ii   | $Zn + dil. HNO_3 (cold) \longrightarrow Zn (label{eq:alpha})$ | $NO_3)_2$ -  | $+ Y + H_2O$                            |  |  |  |
|      |  | Compounds X and Y are, respectively                           |              |   |  |  |  |
|      | (A)  | $N_2O$ , $NO$   | (B)          | $NO_2$ , $NO_2$                         |  |  |  |
|      | (C)  | $N_2, N_2O$   | (D)          | NO <sub>2</sub> , NO                    |  |  |  |
| 116. | When   | KMnO <sub>4</sub> acts as an oxidizing agent in weakly        | y alkali     | ine medium, the oxidation number of     |  |  |  |
|      | mang   | anese decreases by:   | ( <b>T</b> ) | _                                       |  |  |  |
|      | (A)  | 1   | (B)          | 2                                       |  |  |  |
|      | (C)  | 3   | (D)          | 5                                       |  |  |  |
| 117. | Acidified potassium dichromate solution turns green when Na <sub>2</sub> SO <sub>3</sub> is added to it due to the formation of:     |   |              |   |  |  |  |
|      | (A)  | CrSO <sub>4</sub>   | (B)          | $Cr_2(SO_4)_3$                          |  |  |  |
|      | (C)  | $\operatorname{CrO_4}^{2-}$                                   | (D)          | $Cr_2(SO_3)_3$                          |  |  |  |
| 118. | The d-electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ and $Co^{2+}$ are $d^4$ , $d^5$ , $d^6$ and $d^7$ , respectively. |   |              |   |  |  |  |
|      | Which one of the following complexes will exhibit minimum paramagnetic behavior? (atomic $\int G - 24 M = 25 F - 26 G = 27$ )        |   |              |   |  |  |  |
|      | numb   | ers of $Cr=24$ , Mn=25, Fe=26, Co=27)                         | <b>(D</b> )  | $[M_{m}(H, O)]^{2+}$                    |  |  |  |
|      | (A)  | $[Cf(H_2O)_6]$<br>$[F_2(H_1O)_1^{2+}]$                        | (B)<br>(D)   | $[MIn(H_2O)_6]$<br>$[C_2(H_1O)_1^{2+}]$ |  |  |  |
| 110  | (C)  |   | (D)          |   |  |  |  |
| 119. | is:  |   |              |   |  |  |  |
|      | (A)  | 2-Ethoxypentane   | (B)          | Pent-1-ene                              |  |  |  |
|      | (C)  | Cis-Pent-2-ene  | (D)          | Trans-Pent-2-ene                        |  |  |  |
| 120. | Whic   | n of the following undergoes nucleophilic su                  | bstituti     | on exclusively by $S_N^1$ mechnism?     |  |  |  |
|      | (A)  | Chloroethane  | (B)          | Isopropyl chloride                      |  |  |  |
|      | (C)  | Chlorobenzene   | (D)          | Benzyl chloride                         |  |  |  |
| 121. | The number of possible stereoisomers for CH <sub>3</sub> CH=CHCH <sub>2</sub> CH(Br)CH <sub>3</sub> is:                              |   |              |   |  |  |  |
|      | (A)  | 8   | (B)          | 2                                       |  |  |  |
|      | (C)  | 4   | (D)          | 6                                       |  |  |  |
| 122. | 2-Met  | hoxy-2-methylpropane on heating with HI p                     | roduce       | s:                                      |  |  |  |
|      | (A)  | Methanol and sec-propyl iodide                                | (B)          | Methyl iodide and tert-butyl alcohol    |  |  |  |
|      | (C)  | Methyl iodide and isobutene                                   | (D)          | Methanol and tet-butyl iodide           |  |  |  |
| 123. | The le   | east acidic compound among the following is                   | :            |   |  |  |  |
|      | (A) o-Nitrophenol (B) m-Nitrophenol  |   |              |   |  |  |  |
|      | (C)  | p-Nitrophenol   | (D)          | Phenol                                  |  |  |  |

| 124. | An alkene $C_7H_{14}$ on reductive ozonolysis gives an  | aldehy         | de with formula $C_3H_6O$ and a ketone.  |
|------|---|----------------|--|
|      | I he ketone is:   | (D)            | 2 Douton on a                            |
|      | (A) 2-Butanone<br>(C) 2 Pontanone   | (B)            | 2-Pentanone<br>Bronanana                 |
|      | (C) 3-Feilianone  | (D)            | Flopallolle                              |
| 125. | The increasing order of the rate of addition of HCN<br>Acetone iii) Acetophenone iv) benzophenone | V to the       | e compounds i) Formaldehyde ii)          |
|      | (A) $i < iii < iii < iv$  | (B)            | iv < ii < iii < i                        |
|      | (C) $iv < iii < ii < i$   | (D)            | iv< i< ii< iii                           |
| 126. | The carboxylic acid that does not undergo Hell-Vo   | hlard-         | Zelinsky reaction is:                    |
|      | (A) CH <sub>3</sub> COOH  | (B)            | (CH <sub>3</sub> ) <sub>2</sub> CHCOOH   |
|      | (C) $CH_3CH_2CH_2COOH$  | (D)            | (CH <sub>3</sub> ) <sub>3</sub> CCOOH    |
| 127  | NaNO <sub>2</sub> /HCl P/Br <sub>2</sub> NH <sub>2</sub>  |                |  |
| 127. | $C_2H_5NH_2 \longrightarrow X \longrightarrow Y \longrightarrow$                                  | Ζ              |  |
|      | (excess)  | 2              |  |
|      | In the above sequence, Z is:  |                |  |
|      | (A) cyanoethane   | (B)            | ethanamide                               |
|      | (C) methanamine   | (D)            | Ethanamine                               |
| 128. | The attachment of which of the following group at value?  | para p         | position in aniline will raise the $K_b$ |
|      | $(A) = SO_2H$   | (B)            | -0H                                      |
|      | $(\Gamma) -F$   | (D)            | -Br                                      |
| 100  |   | (D)            |  |
| 129. | Which of the following is an example of globular p  | orotein        | 12                                       |
|      | (A) myosin<br>(C) konstin   | (B)            | collagen                                 |
|      | (C) keralin   | (D)            | naemogroom                               |
| 130. | Which one of the following is synthesized in our b  | ody by         | v sun rays?                              |
|      | (A) Vitamin D   | (B)            | Vitamin B                                |
|      | (C) Vitamin K   | (D)            | Vitamin A                                |
| 131. | Caprolactum is the is the starting material for the s   | ynthes         | is of                                    |
|      | (A) Nylon-6   | (B)            | Nylon6,6                                 |
|      | (C) Terylene  | (D)            | Nylon 10                                 |
| 132. | The species which can serve as an initiator for cation  | onic po        | olymerization is                         |
|      | (A) Lithium aluminium hydride   | (B)            | Nitric acid                              |
|      | (C) Aluminium chloride  | (D)            | BuLi                                     |
| 133  | Aspirin is an   |                |  |
| 155. | (A) analgesic   | (B)            | antipyretic                              |
|      | (C) antimalarial  | (D)            | Both analgesic and antipyretic           |
| 124  | The equivalent mass of iron in the reaction $2E_0 + 2$  | (-)            | 2EaCl in:                                |
| 134. | The equivalent mass of non in the reaction $2Fe + 3$<br>(A) Half of its atomic mass               | $(\mathbf{P})$ | One third of its atomic mass             |
|      | (A) That of its atomic mass $(C)$ Same as atomic mass   | $(\mathbf{D})$ | One fourth of its atomic mass            |
| 105  | (c) Same as atomic mass   | (D)            |  |
| 135. | Which of the following sets of quantum numbers is   | s corre        | ect for an electron in 4f subshell?      |
|      | (A) $n=4, l=3, m=4, s=+1/2$   | (B)            | n=4, l=3, m=-4, s=-1/2                   |
|      | (C) $n=4, l=3, m=+1, s=+1/2$  | (D)            | n=3, l=2, m=-2, s=+1/2                   |
| 136. | The correct sequence of atomic radii is:  |                |  |
|      | (A) Na>Mg>Al>Si   | (B)            | Al>Si>Na>Mg                              |
|      | (C) Si>Al>Mg>Na   | (D)            | Si>Al>Na>Mg                              |
|      |   |                |  |
| 137.  | In wh               | ich of the following, the bond angle around t  | he cen         | tral atom is maximum?  |
|-------|---------------------|--|----------------|--|
|       | (A)                 | NH <sub>3</sub>  | (B)            | $\mathrm{NH_4}^+$  |
|       | (C)                 | PCl <sub>3</sub>   | (D)            | SCl <sub>2</sub>   |
| 138.  | Whic                | h of the following molecule does not exist   |                |  |
|       | (A)                 | NF <sub>3</sub>  | (B)            | NF <sub>5</sub>  |
|       | (C)                 | PF <sub>5</sub>  | (D)            | $N_2H_4$   |
| 139.  | If hel              | ium is allowed to expand in vacuum, it libera  | tes hea        | at because   |
|       | (A)                 | It is an inert gas   | (B)            | It is an ideal gas   |
|       | (C)                 | Its critical temp. is low  | (D)            | It is a light gas  |
| 140.  | i) H <sub>2</sub> ( | $g$ ) + 1/2O <sub>2</sub> (g) $\rightarrow$ H <sub>2</sub> O(I)+ x KJ ii) H <sub>2</sub> (g) +                 | $1/2O_{2}$     | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two   |
|       | reacti              | ons,   | 2              | (8) 2-(8) 5 - 7 - 8 8  |
|       | (A)                 | x>y  | (B)            | x <y< td=""></y<>  |
|       | (C)                 | x=y  | (D)            | x+y=0  |
| 141.  | If the              | bond dissociation energies of XY, $X_2$ , $Y_2$ (a)  | l diato        | mic molecules) are in the ratio 1:1:0.5.   |
|       | respec              | ctively and $\Delta_{f}$ of XY is -200KJmol <sup>-1</sup> , the bo   | nd dis         | sociation energy of $X_2$ will be:   |
|       | (A)                 | 400 KJmol <sup>-1</sup>  | (B)            | $300 \text{ KJmol}^{-1}$   |
|       | (C)                 | 200 KJmol <sup>-1</sup>  | (D)            | 100 KJmol <sup>-1</sup>  |
| 142.  | What                | will be the correct order of vapour pressure of  | of wate        | er, ethanol and ether at $30^{\circ}$ C? Given that  |
|       | amon                | g these compounds water has maximum boil   | ing poi        | int and ether has minimum boiling point.   |
|       | (A)                 | Water <ether<ethanol< td=""><td>(B)</td><td>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<> | (B)            | Water <ethanol<ether< td=""></ethanol<ether<>  |
|       | $(\mathbf{C})$      | Fther <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>   | (D)            | Ethanol <ether<water< td=""></ether<water<>  |
| 1.4.2 | (C)<br>W/L:-1       |  | (D)            |  |
| 143.  | which               | n of the following will occur if a 0.1W solution   | on of a        | weak actu is difuted to 0.011vi at   |
|       | $(\Lambda)$         | $[\text{H}^+]$ will decrease to 0.001M   | (D)            | nU will deereese   |
|       | $(\mathbf{A})$      | Percentage ionization will increase  | (D)            | K will increase  |
| 1 4 4 |                     | h a f tha fallessing an acian increase   | (D)            | $\mathbf{X}_{a}$ with increase   |
| 144.  | which (A)           | $M_{PO}^{2-} \rightarrow M_{PO}^{-1}$  | $(\mathbf{D})$ | $M_{\rm A}$ electrons per mole of it ?   |
|       | $(\mathbf{A})$      | $MnO_4 \rightarrow MnO_4$<br>$MnO_2 \rightarrow MnO_4$   | (D)            | $VIIIO_4 \rightarrow VIII$ $C_TO^{2^-} \rightarrow C_T^{3^+}$  |
| 145   | (C)                 | $1 \times 10^{-4} \times 10^{-1} \times 10^{-2}$   | (D)            |  |
| 145.  | 30-vo               | 20% IL O have been a   | <b>(D)</b>     | 20. fll O selection containing 1. f  |
|       | (A)                 | 30% H <sub>2</sub> O <sub>2</sub> by volume  | (D)            | $_{12}$ $_{12$ |
|       | $(\mathbf{C})$      | $1 \text{ cm}^3 \text{ of solution liberates } 30 \text{ cm}^3 \text{ of } \Omega_2$                           | (D)            | $30 \text{ cm}^3$ of the solution contains one   |
|       | (C)                 | gas at STP   | (D)            | mole of $H_2O_2$   |
| 146   | The c               | orrect sequence of covalent character is renre   | sented         | hole of H <sub>2</sub> O <sub>2</sub>  |
| 140.  | THC C               | orrect sequence of covarent enaracter is repre   | sentee         | i dy.  |
|       | (A)                 | LiCl <nacl<becl<sub>2</nacl<becl<sub>  | (B)            | BeCl <sub>2</sub> <licl<nacl< td=""></licl<nacl<>  |
|       | (C)                 | $NaCl < LiCl < BeCl_2$   | (D)            | $BeCl_2 \le NaCl \le LiCl$   |
| 147.  | Whic                | h of the following is known as pyrene?   |                |  |
|       | (A)                 | $\mathrm{CCl}_4$   | (B)            | $CS_2$   |
|       | (C)                 | $S_2Cl_2$  | (D)            | Solid CO <sub>2</sub>  |
| 148.  | The n               | nost stable carbocation amongst the following  | g is:          |  |
|       | (A)                 | $(CH_3)_2CH^+$   | (B)            | $Ph_3C^+$  |
|       | (C)                 | $CH_3CH_2^+$   | (D)            | $CH_2 = CH - CH_2^+$   |
| 149.  | The n               | nolecule that will have dipole moment is:  |                |  |
|       | (A)                 | 2,2-Dimethylpropane  | (B)            | cis-2-Butene   |
|       | (C)                 | trans-2-Butene   | (D)            | 2,2,3,3-Tetramethylbutane  |
| 150.  | Of the              | e five isomeric hexanes, the isomer which can  | n give         | two monochlorinated compound is:   |
|       | (A)                 | 2-Methylpentane  | (B)            | 2,2-Dimethylbutane   |
|       | (C)                 | 2,3-Dimethylbutane   | (D)            | n-Hexane   |

| Which of the following cells in plants show totipot | ency  |  |
|---|---|--|
| (A) Xylem vessels                                   | (B)   | Sieve tubes  |
| (C) Meristem  | (D)   | Cork cells   |
| Father of taxonomy is                               |   |  |
| (A) John Ray  | (B)   | Linnaeus   |
| (C) Aristotle                                       | (D)   | Lamark   |
| Which of the following has more characters in con   | mon   |  |
| (A) Species   | (B)   | Genus  |
| $(\Gamma)$ Class                                    | (D)   | Division   |
| Riccia is a liverwort as it                         | (D)   | Division   |
| $(\Lambda)$ produces liver diseases                 | $(\mathbf{R})$  | is present in liver  |
| $(\mathbf{C})$ cures liver diseases                 | $(\mathbf{D})$  | is like a flat lobed thallus   |
| (C) curves liver diseases                           | (D)   | is like a flat lobed thanus  |
| (A) Large leaves                                    | (D)   | Ciliated groups  |
| (A) Large leaves                                    | (B)   | Cinated sperms   |
| (C) Naked ovules                                    | (D)   | Scale leaves   |
| A root parasite is                                  |   |  |
| (A) Cuscuta   | (B)   | Striga   |
| (C) Brassica  | (D)   | loranthus  |
| Roots that grow from any part of the plant body oth | her that  | an the radicles are  |
| (A) Adventitious roots                              | (B)   | Tap roots  |
| (C) Modified roots                                  | (D)   | Aerial roots   |
| Parallel venation is a characteristic of            |   |  |
| (A) Parasitic plants                                | (B)   | Xerophytic plants  |
| (C) Legumes   | (D)   | Grasses  |
| A bisexual flower which never opens in its life spa | n is ca   | lled   |
| (A) Cleistogamus                                    | (B)   | Heterogamus  |
| (C) Homogamus                                       | (D)   | Dichogamus   |
| Ouiescent centre is located in                      | Ì,  | C C  |
| (A) Shoot apex                                      | (B)   | Root apex  |
| (C) Leaf apex                                       | (D)   | Bud apex   |
| Casparian strips occur in the cells of              |   | I  |
| (A) Epidermis                                       | (B)   | Exodermis  |
| (C) Endodermis                                      | (D)   | Hypodermis   |
| Vascular hundles are absent in                      | (2)   | nypouonins   |
| (A) Monocots  | (B)   | Dicots   |
| $(\Gamma)$ Gymposperms                              | $(\mathbf{D})$  | Pteridonhytes  |
| A aranchyma is derived from                         | (D)   | rtendophytes   |
| (A) Paranchuma                                      | $(\mathbf{P})$  | Salaranahuma   |
| $(A)  \text{Fatenchynia} \\ (C)  \text{Dhloom}$     | (D)   | Scierenciiyina   |
| (C) Philoem   | (D)   | Aylem  |
| vascular bundle naving cambium is                   | <b>(D)</b>  |  |
| (A) closed  | (B)   | open   |
| (C) conjoint  | (D)   | collateral   |
| What do you eat in coconut                          |   |  |
| (A) Embryo  | (B)   | Mesocarp   |
| (C) Entire seed                                     | (D)   | Fruit wall   |
| Phyllode is a modification of                       |   |  |
| (A) Flower  | (B)   | Bud  |
| (C) Root  | (D)   | Petiole  |
| Fingermillet is                                     |   |  |
| (A) Eleusine  | (B)   | Setaria  |
| (C) Pennisetum                                      | (D)   | Sorghum  |
|   | <ul> <li>Which of the following cells in plants show totipot</li> <li>(A) Xylem vessels</li> <li>(C) Meristem</li> <li>Father of taxonomy is</li> <li>(A) John Ray</li> <li>(C) Aristotle</li> <li>Which of the following has more characters in con</li> <li>(A) Species</li> <li>(C) Class</li> <li>Riccia is a liverwort as it</li> <li>(A) produces liver diseases</li> <li>(C) cures liver diseases</li> <li>(C) cures liver diseases</li> <li>(C) Naked ovules</li> <li>A root parasite is</li> <li>(A) Cuscuta</li> <li>(C) <i>Brassica</i></li> <li>Roots that grow from any part of the plant body otf</li> <li>(A) Adventitious roots</li> <li>(C) Modified roots</li> <li>Parallel venation is a characteristic of</li> <li>(A) Parasitic plants</li> <li>(C) Legumes</li> <li>A bisexual flower which never opens in its life spatiant</li> <li>(C) Legumes</li> <li>(C) Leagumes</li> <li>(C) Leaf apex</li> <li>(C) Endodermis</li> <li>(C) Endodermis</li> <li>(C) Endodermis</li> <li>Vascular bundles are absent in</li> <li>(A) Monocots</li> <li>(C) Phloem</li> <li>Vascular bundle having cambium is</li> <li>(A) closed</li> <li>(C) entire seed</li> <li>Phyllode is a modification of</li> <li>(A) Flower</li> <li>(C) Root</li> <li>Fingermillet is</li> <li>(A) <i>Eleusine</i></li> <li>(C) <i>Pennisetum</i></li> </ul> | Which of the following cells in plants show totipotency(A)Xylem vessels(B)(C)Meristem(D)Father of taxonomy is(A)John Ray(B)(C)Aristotle(D)Which of the following has more characters in common(A)Species(B)(C)Aristotle(D)Which of the following has more characters in common(A)Species(B)(C)Class(D)Riccia is a liverwort as it(A)produces liver diseases(D)(A)produces liver diseases(D)Gymnosperms are characterized by(A)Large leaves(B)(C)nate grow from any part of the plant body other that(A)Cuscuta(B)(C)Modified roots(D)Parallel venation is a characteristic of(A)Parasitic plants(B)(C)Legumes(D)A bisexual flower which never opens in its life span is ce(A)Cleistogamus(D)Quiescent centre is located in(A)Shoot apex(B)(C)Leaf apex(D)Casparian strips occur in the cells of(A)(A)Shoot apex(B)(C)Endodermis(D)Vascular bundles are absent in(A)Parenchyma(B)(C)Endodermis(D)Aerenchyma is derived from(A)(A)Parenchyma(B)(C)Conjoint(D)Wascular bundle having cambium is(A)Closed(B)(C)< |

| 168.  | Microsporophyll of Cycas is equivalent to                 | of             | angiosperms               |
|-------|---|----------------|---------------------------|
|       | (A) Sepal   | (B)            | Stamen                    |
|       | (C) Ovary   | (D)            | Ovule                     |
| 169.  | Jackfruit is an example of                                |                |                           |
|       | (A) Multiple fruit  | (B)            | Aggregate fruit           |
|       | (C) Simple fruit  | (D)            | None of these             |
| 170.  | Anther wall in angiosperms contain how many               | wall laver     | S                         |
|       | (A) 3   | (B)            | 4                         |
|       | (C) 5   | (D)            | 6                         |
| 171   | If an endosperm cell of angiosperm has 36 chro            | mosomes        | the root cell should have |
| 1,11  | (A) 18  | (B)            | 16                        |
|       | (C) 4   | (D)            | 24                        |
| 172   | Amino acid synthetase enzyme is activated by              | (2)            | 2.                        |
| 1/2.  | (A) $M\sigma$   | (B)            | Cu                        |
|       | $(\Gamma)$ $Tn$   | (D)            | Fe                        |
| 173   | Number of net gain ATP in aerobic respiration i           |                | 10                        |
| 175.  | ( $\Delta$ ) 2  | (B)            | 42                        |
|       | $\begin{array}{c} (A) & 2 \\ (C) & 38 \end{array}$        | (D)            | 41                        |
| 174   | (C) 56<br>One glucose molecule partially oxidized in anot | (D)            | +1                        |
| 1/4.  | $(\Lambda) = 20 \text{ ATD}_{\odot}$                      | $(\mathbf{D})$ |                           |
|       | $(A)  50 \text{ ATP}_{a}$                                 | (D)            | 30  ATFS                  |
| 175   | (C) 2 AIFS  | (D)            | 15 AIFS                   |
| 173.  | (A) Drimory consumption                                   | <b>(D)</b>     | Drives and the same       |
|       | (A) Primary consumers                                     | (B)            | None of these             |
| 176   | (C) Decomposers   | (D)            | None of these             |
| 1/6.  | The largest cell in the embryo sac is                     |                | <b>F</b>                  |
|       | (A) Central cell  | (B)            | Egg                       |
| 1.77  | (C) Synergias   | (D)            | None of these             |
| 177.  | Double membrane is absent in                              |                |                           |
|       | (A) Mitochondria  | (B)            | Chloroplast               |
| 1 = 0 | (C) Peroxisome  | (D)            | Golgi body                |
| 178.  | DNA content is doubled in stage of c                      | ell divisio    | on l                      |
|       | (A) Prophase  | (B)            | Metaphase                 |
|       | (C) GI-phase  | (D)            | S-phase                   |
| 179.  | A group of individuals of different species is ca         | lled           | ~ ·                       |
|       | (A) Population  | (B)            | Community                 |
|       | (C) Biome   | (D)            | None of these             |
| 180.  | Purines are   |                |                           |
|       | (A) Adenine and Guanine                                   | (B)            | Guanine and Cytosine      |
|       | (C) Thymine and Cytocine                                  | (D)            | Adenine and Thymine       |
| 181.  | The pigment which is absent in chloroplast is             |                |                           |
|       | (A) Chlorophyll 'a'                                       | (B)            | Chlorophyll 'b'           |
|       | (C) Xanthphyll  | (D)            | Anthocyanine              |
| 182.  | Rate of transpiration is measured by                      |                |                           |
|       | (A) Manometer   | (B)            | Potometer                 |
|       | (C) Auxanometer   | (D)            | None of these             |
| 183.  | The site of primary photochemical reaction is             |                |                           |
|       | (A) Stroma  | (B)            | Grana                     |
|       | (C) Periplast cavity                                      | (D)            | Inner layer               |
| 184.  | Father of green revolution in India is                    |                |                           |
|       | (A) N. Borlaug  | (B)            | K.C. Mehta                |
|       | (C) M.S. Swaminathan                                      | (D)            | None of these             |

| 185. | Plants         | s which grow in shade are                        |                |                                     |
|------|----------------|--|----------------|-------------------------------------|
|      | (A)            | Sciophytes                                       | (B)            | Heliophytes                         |
|      | (C)            | Halophytes                                       | (D)            | Psamophytes                         |
| 186. | The a          | mount of living material in different trophic    | levels i       | is called                           |
|      | (A)            | Standing crop                                    | (B)            | Standing state                      |
|      | (C)            | Dry weight                                       | (D)            | Biomass                             |
| 187. | In por         | nd ecosystem pyramid of number is always         |                |                                     |
|      | (A)            | Straight   | <b>(B)</b>     | Linear                              |
|      | (C)            | Upright  | Ď              | Inverted                            |
| 188  | Vege           | tation dominated by shrubs with few tall trees   | s is cal       | led                                 |
| 100. | (A)            | Serule   | (B)            | Marsh                               |
|      | $(\mathbf{C})$ | Grassland  | (D)            | Forest                              |
| 189  | Total          | energy produced during photosynthesis is ca      | lled           | 101050                              |
| 107. | $(\Delta)$     | Total biomass                                    | (B)            | Net hiomass                         |
|      | $(\mathbf{A})$ | Net primary production                           | $(\mathbf{D})$ | Gross primary production            |
| 100  |                | down producers of the accounter are              | (D)            | Gross primary production            |
| 190. |                | Croop plotte                                     | $(\mathbf{D})$ | Drimowy conguments                  |
|      | $(\mathbf{A})$ |  | (Б)<br>(D)     | Norse of these                      |
| 101  | (C)<br>TI      |  | (D)            | None of these                       |
| 191. | I ne c         | nemical knives of DNA are                        |                |                                     |
|      | (A)            | Ligases  | (B)            | Polymerases                         |
| 100  | (C)            | Endonucleases                                    | (D)            | Iranscriptases                      |
| 192. | The I          | ndian variety of rice patented by an American    | n comp         | any is                              |
|      | (A)            | IR 8   | (B)            | Jaya                                |
|      | (C)            | Sona masoori                                     | (D)            | Basmati                             |
| 193. | Pusa           | Komal is a variety of                            |                |                                     |
|      | (A)            | Cowpea   | (B)            | Wheat                               |
|      | (C)            | Brassica   | (D)            | Chilli                              |
| 194. | The s          | talk of the ovule that attaches it to the placen | ta in ar       | ngiosperms is                       |
|      | (A)            | Pedicel  | (B)            | Funiculus                           |
|      | (C)            | Integument                                       | (D)            | Hilum                               |
| 195. | Vallis         | sneria usually favours                           |                |                                     |
|      | (A)            | Zoophily   | (B)            | Entomophily                         |
|      | (C)            | Hydrophily                                       | (D)            | Anemophily                          |
| 196. | An ex          | cample of single cell protein is                 |                |                                     |
|      | (A)            | Spirulina  | (B)            | Volvox                              |
|      | (C)            | Spirogyra  | (D)            | Chlamydomonas                       |
| 197. | Whic           | h forest is named as the "Lungs of the planet"   | "?             |                                     |
|      | (A)            | Western ghats                                    | (B)            | Eastern ghats                       |
|      | (C)            | Amazon rain forest                               | (D)            | Sahara desert                       |
| 198. | The e          | arth summit held at Rio de Janeiro was in the    | e vear         |                                     |
|      | (A)            | 1986   | (B)            | 1902                                |
|      | (C)            | 1992   | Ď              | 1996                                |
| 199  | Lioni          | fied cell wall occurs in                         | (-)            |                                     |
| 177. | (A)            | Endermal cells                                   | (B)            | Cambial cells                       |
|      | $(\Gamma)$     | Phloem cells                                     | $(\mathbf{D})$ | Xylem cells                         |
| 200  | A elia         | le of TS dicot stem shows                        |                |                                     |
| 200. | $(\Delta)$     | Scattered vascular hundles                       | $(\mathbf{R})$ | Vascular hundles arranged in a ring |
|      | $(\mathbf{A})$ | Radial vascular hundles                          | (D)            | Closed vascular bundles             |
|      | $(\mathbf{C})$ |  | (D)            | Ciusua vasculai bulluits            |

| Sr.<br>No | Question  |
|-----------|---|
| 1.        | While walking on smooth surface one should take small steps to ensure(A)Large friction(B)Small friction(C)Larger normal force(D)Smaller normal force  |
| 2.        | What happens to a vehicle travelling in an unbanked curved path if the friction between the roadand tires suddenly disappears(A)Moves along tangent(B)Moves radially in(C)Moves radially out(D)Moves along the curve  |
| 3.        | A ball of mass 0.2 kg strikes an obstacle and moves at $60^{\circ}$ to its initial direction. If its speed changes from 20m/s to 10m/s the magnitude of impulse received by the ball isNs<br>(A) $2\sqrt{7}$ (B) $2\sqrt{3}$<br>(C) $2\sqrt{5}$ (D) $3\sqrt{2}$ |
| 4.        | A spacecraft of mass 2000 kg moving with 600 m/s suddenly explodes into two pieces. One pieceof mass 500 kg is stationary. The velocity of other part in m/s is(A) 600(B) 800(C) 1500(D) 1000   |
| 5.        | 16 kg 8 kg 4 kg 140 N The force on 16 kg is   |
|           | (A)       140N       (B)       120N         (C)       100N       (D)       80N  |
| 6.        | A man of mass 40 kg is at rest between the walls. If coeff. of friction between man and wall is 0.8, find the normal reaction exerted by wall on man (take $g = 10 \text{ m/s/s}$ )   |
|           | (A)         100 N         (B)         250 N           (C)         80 N         (D)         50 N   |
| 7.        | h D   |
|           | Find minimum height in terms of D to complete the loop(A) 7D/4(B) 9D/4(C) 5D/4(D) 3D/4  |
| 8.        | Gravitational force between two bodies is F. The space around the mass is now filled with aliquid of specific gravity 3. The gravitational force will be(A) F/9(B) 3F(C) F(D) F/3   |

| 9.  | <ul><li>A man weighs 75 kg on the surface of earth. H</li><li>(A) infinity</li><li>(C) zero</li></ul>   | is weight on the geostationary satellite is<br>(B) 150kg<br>(D) 75/2 kg  |
|-----|---|--|
| 10. | g at a depth of 1600 km inside the earth in m/s<br>(A) 6.65<br>(C) 8.65   | (B) 7.35<br>(D) 4.35   |
| 11. | A block of mass 19 M is suspended by a string<br>embedded in it. If the block completes the vert<br>(A) 140<br>(C) $20\sqrt{9.8}$   | of length 1m. A bullet of mass M hits it and gets<br>tical circle the velocity of bullet in m/s is<br>(B) $20\sqrt{19.6}$<br>(D) 20                  |
| 12. | A rubber ball falls from a height of 4m and reb<br>impact is<br>(A) 20<br>(C) 23  | <ul><li>(B) 62.5</li><li>(D) 60</li></ul>  |
| 13. | <ul> <li>25 kg of sand is deposited each second on a corequired to maintain the belt in motion is</li> <li>(A) 2600W</li> <li>(C) 325W</li> </ul>                                   | <ul><li>nveyor belt moving at 10m/s. The extra power</li><li>(B) 250W</li><li>(D) 2500W</li></ul>  |
| 14. | A uniform rod of mass M and length L standin<br>slipping at the bottom. The moment of inertia v<br>(A) $ML^{2}/3$<br>(C) $ML^{2}/9$   | g vertically on a horizontal floor falls without<br>will be<br>(B) ML <sup>2</sup> /6<br>(D) ML <sup>2</sup> /12                                     |
| 15. | If the velocity of C.M of a rolling body is V, th<br>(A) $\sqrt{2V}$<br>(C) 2V  | then velocity of highest point in the body will be<br>(B) V<br>(D) $V/\sqrt{2}$  |
| 16. | The angular momentum of two rotating bodies<br>of their rotational K.E is<br>(A) 1:2<br>(C) 1:4   | are equal. If the ratio of their M.I is 1:4, the ratio<br>(B) 2:1<br>(D) 4:1   |
| 17. | The level of water in a tank is 5m. A hole 1 cm<br>/s is (take $g=10 \text{ m/s/s}$ )<br>(A) $10^{-3}$<br>(C) $10$  | $^{2}$ is made at the bottom. The rate of leakage in m <sup>3</sup><br>(B) $10^{-4}$<br>(D) $10^{-2}$  |
| 18. | Two blocks A and B float in water. A floats wi<br>3/5 <sup>th</sup> of its volume immersed. The ratio of their<br>(A) 5:12<br>(C) 3:20  | th 1/4 <sup>th</sup> of its volume immersed and B floats with<br>densities is<br>(B) 12:5<br>(D) 20:3  |
| 19. | The terminal velocity of a spherical ball of lead<br>liquid varies with R such that<br>(A) V/R is constant<br>(C) V is constant   | <ul> <li>d of radius R is Vwhile falling through a viscous</li> <li>(B) VR is constant</li> <li>(D) V/R<sup>2</sup> is constant</li> </ul>           |
| 20. | A hydraulic press uses a piston of 100 cm <sup>2</sup> to ex<br>other piston that supports a mass of 2000 kg is<br>(A) $100$ cm <sup>2</sup><br>(C) $2 \times 10^4$ cm <sup>2</sup> | xert a force of $10^7$ dynes on water. The area of the<br>(take g = 10m/s/s)<br>(B) $10^9$ cm <sup>2</sup><br>(D) $2 \times 10^{10}$ cm <sup>2</sup> |

| 21. | When kerosene and coconut oil of coeff. of viscosity 0.002 and 0.0154 Ns/m <sup>2</sup> are followed through the same pipe, under same pressure difference and same time collects 1 lit of coconut oil. The volume of kerosene that flows is |   |  |
|-----|--|---|--|
|     | (A) $5.5 \text{ lit}$<br>(C) $7.7 \text{ lit}$   | <ul> <li>(B) 6.6 lit</li> <li>(D) 8.8 lit</li> </ul>                                |  |
| 22. | There is a circular hole in metal plate. When the p<br>(A) increased   | late is heated the radius of the hole becomes<br>(B) decreased                      |  |
|     | (C) unchanged  | (D) depends on metal  |  |
| 23. | Specific heat of a substance depends on 1. Nature given to substance   | of substance. 2. Mass of substance. 3. Heat   |  |
|     | <ul><li>(A) Only one is correct</li><li>(C) All are correct</li></ul>  | <ul><li>(B) Both 1 and 2 are correct</li><li>(D) Only 1 and 3 are correct</li></ul> |  |
| 24. | In a give process $dW=0$ , dq is <0 then for a gas   |   |  |
|     | (A) Temperature increases  | (B) Volume decreases  |  |
| 0.5 | (C) Pressure increases   | (D) Pressure decreases  |  |
| 25. | (A) Working substance  | (B) Sink temperature  |  |
|     | (C) Source temperature   | (D) Both B and C  |  |
| 26. | A 200 turn coil of self inductance 30 mH carries a with each turn of coil.   | current of 5 mA. Find the magnetic flux linked                                      |  |
|     | (A) $7.5 \times 10^{-7}$ Wb  | (B) $1.6 \times 10^{-7}$ Wb<br>(D) $1.5 \times 10^{-7}$ Wb                          |  |
| 27  | (C) 5 X 10 WU<br>The instantaneous value of current in an AC circu   | (D) 1.5 x 10 wb<br>it is I = 2 sin (100 $\pi$ t + $\pi/3$ ) A At what first         |  |
| 21. | time the current will be maximum?  | $1131 - 2311(100 \ h t + h/5) \ A.$ At what hist                                    |  |
|     | (A) $1/100 \text{ s}$  | (B) 1/200 s   |  |
| 20  | (C) 1/500 s  | (D) Is  |  |
| 28. | (A) L  | (B) I   |  |
|     | (C) $1/C$  | (D) q   |  |
| 29. | A capacitor of 1 $\mu$ F is charged with 0.01C of elect  | tricity. How much energy is stored in it?   |  |
|     | (A) 30 J<br>(C) 50 J   | (B) 40 J<br>(D) 60 J  |  |
| 30  | An electromagnetic wave is travelling in vacuum  | with a speed of 3 x $10^8$ m/s. Find the velocity in                                |  |
| 50. | a medium having relative electric and magnetic pe  | ermeability 2 and 1, respectively.  |  |
|     | (A) $3/\sqrt{2} \times 10^8$ m/s   | (B) $1.5 \times 10^8 \text{m/s}$  |  |
| 21  | (C) $2 \times 10^{\circ} \text{m/s}$   | (D) No change   |  |
| 31. | refractive index of glass is $\sqrt{3}$ , find out the value of  | of angle of emergence from prism.   |  |
|     | 60   |   |  |
|     | (A) 30   | (B) 45  |  |

| 32. | Light wave from two coherent sources of intensities in ratio 64:1 produces interference. Calcula the ration of maximum and minima of the interference pattern.<br>(A) $8:1$ (B) $64:1$         |  |   |  |
|-----|--|--|---|--|
|     | (A) = 6.1<br>(C) 9:7   | (D)  | 81:49   |  |
| 33. | In young's experiment, the width of the fringes of mm. What will be the fringe width, if the entire a index 1.33?  | obtained<br>apparatu   | with light of wavelength 6000 A° is 2 s is immersed in a liquid of refractive         |  |
|     | (A) 1 mm<br>(C) 2 mm   | (B)<br>(D)   | 1.5 mm<br>2.5 mm  |  |
| 34. | Unpolarised light is incident on plane glass surf degrees, so that the reflected and refracted rays a (A) 37   | ace. What when the terms of terms o | at should be the angle of incidence in<br>indicular to each other?                    |  |
|     | (C) 57   | (D)  | 67  |  |
| 35. | Determine the de-Broglie wavelength associated   | l with an  | electron, accelerated through a potential   |  |
|     | (A) $1.227A^{\circ}$   | (B)  | 12.27A°   |  |
|     | (C) 122.7A°  | (D)  | 1227A°  |  |
| 36. | A particle with rest mass m <sub>0</sub> is moving with velo<br>associated with it?  | ocity c. V   | Vhat is the de-Broglie wavelength   |  |
|     | (A) infinity   | (B)  | zero  |  |
|     | (C) radio wave   | (D)  | X ray   |  |
| 37. | Which among the following series gives visible   | light?   |   |  |
|     | (A) Lyman<br>(C) Brooket   | (B)  | Balmer  |  |
| 20  | (C) Diacket  | (D)  | None  |  |
| 38. | A  | rcuit  |   |  |
|     |  | _  |   |  |
|     |  |  |   |  |
|     |  | X  |   |  |
|     |  |  |   |  |
|     | $\mathbf{B}$   | ( <b>B</b> )   | OP  |  |
|     | (C) NAND   | (D)  | NOR   |  |
| 39. | The number of silicon atoms per m <sup>3</sup> is 5 x $10^{28}$ .<br>per m <sup>3</sup> of arsenic and 5 x $10^{20}$ atoms per m <sup>3</sup> of in<br>$n = 1.5 \times 10^{16} \text{ m}^{-3}$ | This is d<br>dium. Ca  | oped simultaneously with 5 x $10^{22}$ atoms alculate the number of holes, given that |  |
|     | (A) $4.54 \times 10^9 \text{m}^{-3}$   | (B)  | $4.95 \ge 10^{22} \text{m}^{-3}$  |  |
|     | (C) $1.5 \times 10^{16} \text{m}^{-3}$   | (D)  | $5 \ge 10^{28} \text{m}^{-3}$   |  |
| 40. | Two charges $+5\mu C$ and $-5\mu C$ are placed 5 mm as on the positive charge side along the axial line.   | part. Det  | termine E at a point 10 cm from centre  |  |
|     | (A) $4.5 \times 10^5 \text{N/C}$   | (B)  | 4.5 x 10 <sup>5</sup> NC  |  |
|     | (C) $4.5 \times 10^{-5} \text{N/C}$  | (D)  | 4.5 x 10 <sup>-5</sup> NC   |  |
| 41. | If the Gaussian surface is so chosen that there are electric field is due to   | e some c   | sharges inside and some outside than the  |  |
|     | (A) Only inside charges  | (B)  | Only outside charges  |  |

(C) All the charges (D) Cannot determine

42. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



43. Net capacitance of 3 identical capacitor in series is 1  $\mu$ *F*. What is the net capacitance in  $\mu$ *F* if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

44. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

45. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

46.



| 47. Two identical circular loops P and Q of radius r are placed in parallel planes with same distance of 2r. Find B at the midpoint of the axis between them if same current I flows |                           |   | d in parallel planes with same axis at a them if same current I flows through |   |
|--|---------------------------|---|---|---|
|  | both l                    | oops.   | ( <b>T</b> )  | (- <sup>3</sup> /2  |
|  | (A)                       | $\mu_0 l/2^{3/2} r$   | (B)   | $\mu_0 2 \frac{1}{2^{n/2}r}$  |
| 10   | (C)                       | $\mu_0 l/4\pi r$  | (D)   | Cannot be determined  |
| 48.  | A blo<br>0.8. If<br>betwe | ck of mass 4 kg is kept on a rough horizontal<br>a force of 19 N is applied on the block paral<br>en the block and floor is:  | surfac  | he floor, then the force of friction  |
|  | (A)                       | 19N   | (B)   | 18 N  |
|  | (C)                       | 16N   | (D)   | 9.8N  |
| 49.  | Curre                     | nt in a circuit falls steadily from 2A to 0A in   | 10 ms.  | . Calculate L if emf induced is 200V.   |
|  | (A)                       | 1H  | (B)   | 2Н  |
|  | (C)                       | 3Н  | (D)   | 4H  |
| 50.  | Self in core.             | nductance of the air core inductor increases fr<br>What is the relative permeability of the core u  | om 0.0<br>ised?   | 01 mH to 10 mH on introducing an iron   |
|  | (A)                       | 500   | (B)   | 800   |
|  | (C)                       | 900   | (D)   | 1000  |
| 51.  | Amor                      | ig the following, the most stable complex is  |   |   |
|  | (A)                       | $[Fe (H_2O)_6]^{3+}$  | (B)   | $[Fe (NH_3)_6]^{3+}$  |
|  | (C)                       | $[Fe (C_2O_4)_3]^{3-}$  | (D)   | $[Fe (Cl)_6]^{3-}$  |
| 52.  | Whicl<br>metal            | h is the correct coordination number (C.N) an atom in $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?  | d oxid  | lation number (O.N) of the transition   |
|  | (A)                       | C.N=3, O.N=+1   | (B)   | C.N=4, O.N=+2   |
|  | (C)                       | C.N=6, O.N=+1   | (D)   | C.N=6, O.N=+3   |
| 53.  | In a so                   | olid, oxide ions are arranged in ccp, cations A   | occup   | py one sixth of the tetrahedral voids and   |
|  | cation                    | B occupy one third of the octahedral voids.   | The fo  | rmula of the solid is:  |
|  | (A)                       | $ABO_3$   | (B)   | A <sub>3</sub> BO   |
|  | (C)                       | $AB_{3}O$   | (D)   | $A_3B_3O_3$   |
| 54.  | On m                      | ixing acetone to methanol some of the hydrog  | gen bo  | nds between methanol molecules break.   |
|  | Whick                     | h of the following statements is correct about  | the ab  | ove process?  |
|  | (A)                       | At specific composition methanol acetone  | (B)   | At specific composition methanol  |
|  |                           | mixture will form minimum boiling   |   | acetone mixture will form maximum   |
|  |                           | azeotrope and show positive deviation   |   | boiling azeotrope and show positive   |
|  |                           | from Raoult's law   | ( <b>-</b> )  | deviation from Raoult's law   |
|  | (C)                       | At specific composition methanol acetone  | (D)   | At specific composition methanol  |
|  |                           | mixture will form minimum boiling   |   | acetone mixture will form maximum   |
|  |                           | azeotrope and show negative deviation   |   | boiling azeotrope and show negative   |
|  | 17                        | from Raoult's law   |   | deviation from Raoult's law   |
| 55.  | $K_{\rm H}$ va            | lue for argon, carbon dioxide, formaldehyde   | and me  | ethane gases are $40.39, 1.67, 1.83 \times 10^{\circ}$                                  |
|  | and 0                     | (413, respectively. The correct arrangement o   | f these   | gases in the order of their increasing  |
|  | (A)                       | formaldehyde <methane<carbon<br>dioxide<argon< td=""><td>(B)</td><td>formaldehyde&lt; carbon dioxide<br/><methane<argon< td=""></methane<argon<></td></argon<></methane<carbon<br>  | (B)   | formaldehyde< carbon dioxide<br><methane<argon< td=""></methane<argon<>                 |
|  | (C)                       | argon <carbon dioxide<<br="">methane<formaldehyde< td=""><td>(D)</td><td>argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane></td></formaldehyde<></carbon>  | (D)   | argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane> |
| 56.  | The n<br>nitrob           | umber of faradays of electricity required for | electro   | lytic conversion of the mole of   |
|  | (A)                       | 3F  | (B)   | 4F  |
|  | (C)                       | 6F  | (D)   | 5F  |

| 57.               | The p          | ositive value of the standard electrode potent                            | tial of .    | $Ag^{+}/Ag$ indicates that:   |
|-------------------|----------------|---|--------------|---|
|                   | (A)            | This redox couple is a stronger reducing agent than $H^+/H_2$ couple      | (B)          | This redox couple is a stronger oxidizing agent than $H^+/H_0$ couple     |
|                   | (C)            | Ag can displace $H_2$ from acid   | (D)          | Ag can displace $H_2$ from base   |
| 58.               | Milk<br>reacti | is refrigerated in order to slow the rate of dec<br>on rate is due to:    | compos       | sition by bacterial action. The decrease in                               |
|                   | (A)            | A decrease in surface area  | (B)          | A decrease in $\triangle$ H for the reaction                              |
|                   | (C)            | A decrease in the fraction of particles                                   | (D)          | The introduction of an alternative  |
|                   |                | possessing sufficient energy  |              | pathway with greater activation energy.                                   |
| 59.               | Whic           | h of the following statements is not correct?                             | ( <b>T</b> ) |   |
|                   | (A)            | The rate of a reaction decreases with passage of time as concentration of | (B)          | The instantaneous rate a reaction is same at any time during the reaction |
|                   |                | reactants decrease  |              |   |
|                   | (C)            | For a zero order reaction the   | (D)          | The rate of a reaction decreases with                                     |
|                   |                | concentration of reactants remains<br>changed with passage of time        |              | increase in concentration of reactant (s)                                 |
| 60.               | Whic           | h of the following gases shows the lowest ad                              | sorptic      | on per gram of charcoal? The critical                                     |
|                   | tempe          | eratures are given in parenthesis:  | •            |   |
|                   | (A)            | $H_2(33K)$  | (B)          | CH <sub>4</sub> (190K)  |
|                   | (C)            | $SO_2(630K)$  | (D)          | $CO_2(304K)$  |
| 61.               | Freun          | idlich adsorption isotherm is given by the exp<br>nents are false?        | pressio      | n x/m= $kp^{1/n}$ . Which of the following                                |
|                   | i.             | When $1/n=0$ , the adsorption is independent                              | ndent o      | of pressure.  |
|                   | ii             | . When n=0, the plot of $x/m$ vs p graph                                  | is a lir     | ne parallel to x axis.  |
|                   | ii             | i. When 1/n=0, the adsorption is directly                                 | v propo      | ortional to pressure.   |
|                   | iv             | When n=0, plot of $x/m$ vs p is a curve                                   |              |   |
|                   | (A)            | 1 and 11  | (B)          | 11 and 1V   |
| 67                | (C)<br>In the  | and m   | (D)          | an arc raise  |
| 02.               | the fo         | allowing statements are true?   | queou        | s solution of socium chioride, which of                                   |
|                   | i.             | $\Delta$ G <sup>0</sup> for the overall reaction is positiv               | ve           |   |
|                   | ii             | $\Delta G^0$ for the overall reaction is negative.                        | ve           |   |
|                   | ii             | i. $E^0$ for the overall reaction is positive                             |              |   |
|                   | iv             | $E^0$ for the overall reaction is negative                                |              |   |
|                   | (A)            | i and iv  | (B)          | i and iii   |
|                   | (C)            | 11 and 111  | (D)          | 111 and 1V  |
| 63.               | Whic           | h of the following pairs of ions are isoelectro                           | nic an       | d isostructural ?   |
|                   | (A)            | $NO_2^{-1}$ and $NO_3^{-1}$   | (B)          | $ClO_3$ and $ICl_4$   |
| <i>с</i> <b>н</b> | (C)            | XeO <sub>3</sub> and PCI <sub>3</sub>                                     | (D)          | $CIO_3$ and $SO_3$  |
| 64.               | Whic           | h of the following hydrides is the strongest re                           | ducing       | g agent?  |
|                   | (A)            |   | (B)          | PH3<br>Shu  |
| ( =               | (C)<br>Const   | ASII3   | (D)          | 50113   |
| 63.               | Consi          | Ider the reactions,<br>$7n + Conc.$ HNO: (bot) $\longrightarrow$ $7n$ (b  | JO.)         | $+ X + H_{\bullet}O$  |
|                   | 1.<br>ii       | $Zn + dil_{1} HNO_{2} (cold) \longrightarrow Zn (l)$                      | $NO_{2}$     | $+ Y + H_2O$  |
|                   | 11             | Compounds X and Y are, respectively                                       | ,            |   |
|                   | (A)            | N <sub>2</sub> O, NO  | (B)          | $NO_2$ , $NO_2$   |
|                   | (C)            | N <sub>2</sub> , N <sub>2</sub> O   | (D)          | NO <sub>2</sub> , NO  |
|                   |                |   |              |   |

## 7 PCB C

| 66. | When $KMnO_4$ acts as an oxidizing agent in weakly alkaline medium, the oxidation number of manganese decreases by: |   |                |   |  |
|-----|---|---|----------------|---|--|
|     | (A)   | 1   | (B)            | 2   |  |
|     | (C)   | 3   | (D)            | 5   |  |
| 67. | Acidit  | fied potassium dichromate solution turns gree                                   | n whe          | n Na <sub>2</sub> SO <sub>3</sub> is added to it due to the |  |
|     | $(\Delta)$  | CrSO  | $(\mathbf{R})$ | $Cr_2(SO_1)_2$  |  |
|     | $(\Lambda)$   | $CrO_{4}^{2-}$  | $(\mathbf{D})$ | $Cr_2(SO_4)_3$  |  |
| 60  |   | electron configurations of $Cr^{2+}$ $Mr^{2+}$ $Es^{2+}$                        | (D)            | $d^4$ and $d^5$ $d^6$ and $d^7$ magnitudes                  |  |
| 08. | Which   | to ne of the following complexes will exhibit ers of $Cr=24$ Mn=25 Fe=26 Co=27) | minin          | num paramagnetic behavior? (atomic                          |  |
|     | (A)   | $[Cr(H_2O)_6]^{2+}$   | (B)            | $[Mn(H_2O)_6]^{2+}$   |  |
|     | (C)   | $[Fe(H_2O)_6]^{2+}$   | (D)            | $[Co(H_2O)_6]^{2+}$   |  |
| 69. | When  | 2-Bromopentane is heated with potassium et                                      | hoxide         | e in ethanol, the major product obtained                    |  |
|     | 1S:   | 2 Eth annual to a s   | <b>(D)</b>     | Dané 1 ana  |  |
|     | (A)   | 2-Ethoxypentane   | (B)            | Pent-1-ene  |  |
|     | (C)   | Cis-Pent-2-ene  | (D)            | Trans-Pent-2-ene  |  |
| 70. | Which   | n of the following undergoes nucleophilic sub                                   | stituti        | on exclusively by S <sub>N</sub> <sup>1</sup> mechnism?     |  |
|     | (A)   | Chloroethane  | (B)            | Isopropyl chloride  |  |
|     | (C)   | Chlorobenzene   | (D)            | Benzyl chloride   |  |
| 71. | The m   | umber of possible stereoisomers for CH <sub>3</sub> CH=                         | CHCH           | $H_2$ CH(Br)CH <sub>3</sub> is:                             |  |
|     | (A)   | 8   | (B)            | 2   |  |
|     | (C)   | 4   | (D)            | 6   |  |
| 72. | 2-Met   | hoxy-2-methylpropane on heating with HI pr                                      | oduce          | S:  |  |
|     | (A)   | Methanol and sec-propyl iodide  | (B)            | Methyl jodide and tert-butyl alcohol                        |  |
|     | (C)   | Methyl iodide and isobutene   | (D)            | Methanol and tet-butyl jodide                               |  |
| 73  | The le  | east acidic compound among the following is                                     | (-)            |   |  |
| 15. | $(\Delta)$  | o-Nitronhenol   | (R)            | m-Nitrophenol   |  |
|     | $(\mathbf{\Gamma})$   | n-Nitrophenol   | $(\mathbf{D})$ | Phenol  |  |
| 71  | (C)   | rang C. H. an reductive exemplying gives on                                     | (D)            | de with formula C II O and a latena                         |  |
| /4. | The la  | etone is:   | aldeny         | de with formula $C_3 \Pi_6 O$ and a ketone.                 |  |
|     | $(\Lambda)$   | 2 Butanone  | $(\mathbf{P})$ | 2 Dontonono   |  |
|     | $(\mathbf{A})$  | 2-Dutatione<br>2 Dentenone  | $(\mathbf{D})$ | 2-1 childholic  |  |
| 76  | (C)<br>TI   |   |                |   |  |
| /5. | The increasing order of the rate of addition of HCN to the compounds 1) Formaldehyde 11)                            |   |                |   |  |
|     | Aceto   | ne iii) Acetophenone iv) benzophenone   |                |   |  |
|     | (A)   | 1<11 < 111< 1V  | (B)            | 1V < 11 < 111 < 1   |  |
|     | (C)   | 1V<111< 11< 1   | (D)            | 1V< 1< 11< 111  |  |
| 76. | The ca  | arboxylic acid that does not undergo Hell-Vo                                    | hlard-2        | Zelinsky reaction is:                                       |  |
|     | (A)   | CH <sub>3</sub> COOH  | (B)            | (CH <sub>3</sub> ) <sub>2</sub> CHCOOH                      |  |
|     | (C)   | CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH                            | (D)            | (CH <sub>3</sub> ) <sub>3</sub> CCOOH                       |  |
| 77. |   | NaNO <sub>2</sub> /HCl P/Br <sub>2</sub> NH <sub>3</sub>                        |                |   |  |
|     | $C_2H_5N$   | $NH_2 \longrightarrow X \longrightarrow Y \longrightarrow$                      | Ζ              |   |  |
|     |   | (excess)  |                |   |  |
|     | In the  | above sequence, Z is:   |                |   |  |
|     | (A)   | cyanoethane   | (B)            | ethanamide  |  |
|     | (C)   | methanamine   | (D)            | Ethanamine  |  |
| 78. | The at  | ttachment of which of the following group at                                    | para p         | osition in aniline will raise the $K_b$                     |  |
|     | $(\Delta)$  | -SO <sub>2</sub> H  | $(\mathbf{R})$ | -OH   |  |
|     | (C)   | _F  | (D)            | -Br   |  |
|     | $(\mathbf{U})$  | 1   | (D)            | ות  |  |

| 79. | Whicl               | h of the following is an example of globular p   | orotein            | ?  |
|-----|---------------------|--|--------------------|--|
|     | (A)                 | myosin   | (B)                | collagen   |
|     | (C)                 | keratin  | (D)                | haemoglobin  |
| 80. | Whicl               | h one of the following is synthesized in our b   | ody by             | / sun rays?  |
|     | (A)                 | Vitamin D  | (B)                | Vitamin B  |
|     | (C)                 | Vitamin K  | (D)                | Vitamin A  |
| 81. | Capro               | lactum is the is the starting material for the s   | ynthes             | is of  |
|     | (A)                 | Nylon-6  | (B)                | Nylon6,6   |
|     | (C)                 | Terylene   | (D)                | Nylon 10   |
| 82. | The sp              | pecies which can serve as an initiator for cation  | onic po            | olymerization is                                     |
|     | (A)                 | Lithium aluminium hydride  | (B)                | Nitric acid  |
|     | (C)                 | Aluminium chloride   | (D)                | BuLi   |
| 83. | Aspiri              | in is an:  |                    |  |
|     | (A)                 | analgesic  | (B)                | antipyretic  |
|     | (C)                 | antimalarial   | (D)                | Both analgesic and antipyretic                       |
| 84. | The e               | quivalent mass of iron in the reaction 2Fe + 3   | $Cl_2 \rightarrow$ | • 2FeCl <sub>3</sub> is:                             |
|     | (A)                 | Half of its atomic mass  | (B)                | One third of its atomic mass                         |
|     | (Ć)                 | Same as atomic mass  | (D)                | One fourth of its atomic mass                        |
| 85. | Whiel               | h of the following sets of quantum numbers is  | s corre            | ect for an electron in 4f subshell?                  |
|     | (A)                 | n=4, l=3, m=4, s=+1/2  | (B)                | n=4, l=3, m=-4, s=-1/2                               |
|     | (C)                 | n=4, l=3, m=+1, s=+1/2   | (D)                | n=3, l=2, m=-2, s=+1/2                               |
| 86. | The c               | orrect sequence of atomic radii is:  |                    |  |
|     | (A)                 | Na>Mg>Al>Si  | (B)                | Al>Si>Na>Mg  |
|     | (C)                 | Si>Al>Mg>Na  | (D)                | Si>Al>Na>Mg  |
| 87. | In wh               | ich of the following, the bond angle around the  | he cen             | tral atom is maximum?                                |
|     | (A)                 | NH <sub>3</sub>  | (B)                | $\mathrm{NH_4}^+$                                    |
|     | (C)                 | PCl <sub>3</sub>   | (D)                | $SCl_2$  |
| 88. | Whicl               | h of the following molecule does not exist   |                    |  |
|     | (A)                 | NF <sub>3</sub>  | (B)                | NF <sub>5</sub>                                      |
|     | (C)                 | PF <sub>5</sub>  | (D)                | $N_2H_4$   |
| 89. | If heli             | um is allowed to expand in vacuum, it libera   | tes hea            | at because   |
|     | (A)                 | It is an inert gas   | (B)                | It is an ideal gas                                   |
|     | (C)                 | Its critical temp. is low  | (D)                | It is a light gas                                    |
| 90. | i) H <sub>2</sub> ( | $g$ ) + 1/2O <sub>2</sub> ( $g$ ) $\rightarrow$ H <sub>2</sub> O(I)+ x KJ ii) H <sub>2</sub> ( $g$ ) +     | $1/2O_{2}$         | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two |
|     | reaction            | ons,   |                    |  |
|     | (A)                 | x>y  | (B)                | x <y< td=""></y<>                                    |
|     | (C)                 | x=y  | (D)                | x+y=0  |
| 91. | If the              | bond dissociation energies of XY, $X_2$ , $Y_2$ (all   | diato              | mic molecules) are in the ratio 1:1:0.5,             |
|     | respec              | ctively and $\Delta_{\rm f}$ H of XY is -200KJmol <sup>-1</sup> , the bo                                   | nd dise            | sociation energy of $X_2$ will be:                   |
|     | (A)                 | 400 KJmol <sup>2</sup>   | (B)                | 300 KJmol <sup>2</sup>                               |
|     | (C)                 | 200 KJmol  | (D)                |  |
| 92. | What                | will be the correct order of vapour pressure of  | of wate            | er, ethanol and ether at 30°C? Given that            |
|     | among               | g these compounds water has maximum boili  | ng poi             | Int and ether has minimum boiling point.             |
|     | (A)                 | Water <ether<ether< td=""><td>(B)</td><td>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ether<> | (B)                | Water <ethanol<ether< td=""></ethanol<ether<>        |
| 02  | (C)                 |  | (D)                |  |
| 93. | w hich              | n of the following will occur if a 0.1M solution   | on of a            | weak acto is diluted to 0.01M at                     |
|     | $(\Delta)$          | $[H^+]$ will decrease to 0.001M  | (R)                | nH will decrease                                     |
|     | $(\mathbf{C})$      | Percentage ionization will increase  | (D)                | K will increase                                      |
|     | $(\mathbf{U})$      | i oroniugo ionization win morease  | (1)                |  |

| 94.         | Which of the following species involves the trans                       | fer of 5       | N <sub>A</sub> electrons per mole of it ?         |
|-------------|---|----------------|---|
|             | (A) $MnO_4^{2-} \rightarrow MnO_4^{}$                                   | (B)            | $MnO_4 \rightarrow Mn^{2+}$                       |
|             | (C) $MnO_4 \rightarrow MnO_2$   | (D)            | $CrO_4^{2-} \rightarrow Cr^{3+}$                  |
| 95.         | 30-volume hyderogen peroxide means:                                     |                |   |
|             | (A) $30\%$ H <sub>2</sub> O <sub>2</sub> by volume                      | (B)            | $30g$ of $H_2O_2$ solution containing 1g of it    |
|             | (C) 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ | (D)            | $30 \text{ cm}^3$ of the solution contains one    |
|             | gas at STP  |                | mole of $H_2O_2$                                  |
| 96.         | The correct sequence of covalent character is repr                      | esentec        | l by:   |
|             | (A) LiCl <nacl<becl<sub>2</nacl<becl<sub>                               | (B)            | BeCl <sub>2</sub> <licl<nacl< td=""></licl<nacl<> |
|             | (C) NaCl $<$ LiCl $<$ BeCl <sub>2</sub>                                 | (D)            | BeCl <sub>2</sub> <nacl<licl< td=""></nacl<licl<> |
| 97.         | Which of the following is known as pyrene?                              |                |   |
|             | (A) $CCl_4$   | <b>(B)</b>     | CS <sub>2</sub>                                   |
|             | (C) S <sub>2</sub> Cl <sub>2</sub>                                      | (D)            | Solid CO <sub>2</sub>                             |
| 98          | The most stable carbocation amongst the followin                        | g is.          | -   |
| 201         | (A) $(CH_2)_2CH^+$  | (B)            | $Ph_2C^+$   |
|             | (C) $CH_2CH_2^+$  | (D)            | $CH_2 = CH - CH_2^+$                              |
| 99          | The molecule that will have dipole moment is:                           | (-)            |   |
| <i>))</i> . | (A) $22$ -Dimethylpropane   | (B)            | Cis-2-Butene                                      |
|             | (C) Trans-2-Butene  | $(\mathbf{D})$ | 2 2 3 3-Tetramethylbutane                         |
| 100         | Of the five isomeric havanes, the isomer which ca                       | n give         | two monochloringted compound is:                  |
| 100.        | (A) 2-Methylpentane   | $(\mathbf{R})$ | 2 2-Dimethylbutane                                |
|             | (C) = 2 3-Dimethylbutane  | $(\mathbf{D})$ | n-Heyane  |
| 101         | Which of the following colla in glosts show to time                     | (D)            | II-HEXAIIC  |
| 101.        | (A) Vulue vagada  | (D)            | Siava takas                                       |
|             | (A) Aylem vessels   | (B)            | Sieve tubes                                       |
| 100         | (C) Meristem  | (D)            | Cork cells  |
| 102.        | Father of taxonomy is   |                | <b>T</b> '  |
|             | (A) John Ray  | (B)            | Linnaeus  |
|             | (C) Aristotle   | (D)            | Lamark  |
| 103.        | Which of the following has more characters in con                       | mmon           | ~   |
|             | (A) Species   | (B)            | Genus   |
|             | (C) Class   | (D)            | Division  |
| 104.        | Riccia is a liverwort as it   |                |   |
|             | (A) produces liver diseases   | (B)            | is present in liver                               |
|             | (C) cures liver diseases  | (D)            | is like a flat lobed thallus                      |
| 105.        | Gymnosperms are characterized by  |                |   |
|             | (A) Large leaves  | (B)            | Ciliated sperms                                   |
|             | (C) Naked ovules  | (D)            | Scale leaves                                      |
| 106.        | A root parasite is  |                |   |
|             | (A) Cuscuta   | (B)            | Striga  |
|             | (C) Brassica  | Ď              | loranthus   |
| 107         | Roots that grow from any part of the plant body of                      | ther the       | an the radicles are                               |
| 107.        | (A) Adventitious roots  | (B)            | Tan roots   |
|             | (C) Modified roots  | (D)            | Aerial roots                                      |
| 109         | Parallal vanation is a characteristic of                                | (1)            | 10100   |
| 100.        | $(\Lambda)$ Deresitic plants  | (D)            | Veronhytic plants                                 |
|             | (C) Legumes   | (D)<br>(D)     | Grosses   |
|             | (C) Legumes   | (D)            | 0105565   |
|             |   |                |   |

| 109. | A bisexual flower which never opens in its life | span is ca | lled                        |
|------|---|------------|-----------------------------|
|      | (A) Cleistogamus                                | (B)        | Heterogamus                 |
|      | (C) Homogamus                                   | (D)        | Dichogamus                  |
| 110. | Quiescent centre is located in                  |            |                             |
|      | (A) Shoot apex                                  | (B)        | Root apex                   |
|      | (C) Leaf apex                                   | (D)        | Bud apex                    |
| 111. | Casparian strips occur in the cells of          |            |                             |
|      | (A) Epidermis                                   | (B)        | Exodermis                   |
|      | (C) Endodermis                                  | (D)        | Hypodermis                  |
| 112. | Vascular bundles are absent in                  |            |                             |
|      | (A) Monocots                                    | (B)        | Dicots                      |
|      | (C) Gymnosperms                                 | (D)        | Pteridophytes               |
| 113. | Aerenchyma is derived from                      |            |                             |
|      | (A) Parenchyma                                  | (B)        | Sclerenchyma                |
|      | (C) Phloem                                      | (D)        | Xylem                       |
| 114. | Vascular bundle having cambium is               |            |                             |
|      | (A) closed                                      | (B)        | open                        |
|      | (C) conjoint                                    | (D)        | collateral                  |
| 115. | What do you eat in coconut                      |            |                             |
|      | (A) Embryo                                      | (B)        | Mesocarp                    |
|      | (C) Entire seed                                 | (D)        | Fruit wall                  |
| 116. | Phyllode is a modification of                   |            |                             |
|      | (A) Flower                                      | (B)        | Bud                         |
|      | (C) Root  | (D)        | Petiole                     |
| 117. | Fingermillet is                                 |            |                             |
|      | (A) Eleusine                                    | (B)        | Setaria                     |
|      | (C) Pennisetum                                  | (D)        | Sorghum                     |
| 118. | Microsporophyll of Cycas is equivalent to       | of         | angiosperms                 |
|      | (A) Sepal                                       | (B)        | Stamen                      |
|      | (C) Ovary                                       | (D)        | Ovule                       |
| 119. | Jackfruit is an example of                      |            |                             |
|      | (A) Multiple fruit                              | (B)        | Aggregate fruit             |
|      | (C) Simple fruit                                | (D)        | None of these               |
| 120. | Anther wall in angiosperms contain how many     | wall layer | ſS                          |
|      | (A) 3   | (B)        | 4                           |
|      | (C) 5   | (D)        | 6                           |
| 121. | If an endosperm cell of angiosperm has 36 chro  | mosomes    | , the root cell should have |
|      | (A) 18  | (B)        | 16                          |
|      | (C) 4   | (D)        | 24                          |
| 122. | Amino acid synthetase enzyme is activated by    |            |                             |
|      | (A) Mg  | (B)        | Cu                          |
|      | (C) Zn  | (D)        | Fe                          |
| 123. | Number of net gain ATP in aerobic respiration   | is         |                             |
|      | (A) 2   | (B)        | 42                          |
|      | (C) 38  | (D)        | 41                          |
| 124. | One glucose molecule partially oxidized in ana  | erobic res | piration produces           |
|      | (A) 30 ATPs                                     | (B)        | 38 ATPs                     |
|      | (C) 2 ATPs                                      | (D)        | 15 ATPs                     |
|      |   |            |                             |

| 125. | In for         | est ecosystem green plants are             |                |                          |
|------|----------------|--|----------------|--------------------------|
|      | (A)            | Primary consumers                          | (B)            | Primary producers        |
|      | (C)            | Decomposers                                | (D)            | None of these            |
| 126. | The l          | argest cell in the embryo sac is           |                |                          |
|      | (A)            | Central cell                               | (B)            | Egg                      |
|      | (C)            | Synergids                                  | (D)            | None of these            |
| 127. | Doub           | le membrane is absent in                   |                |                          |
|      | (A)            | Mitochondria                               | (B)            | Chloroplast              |
|      | (C)            | Peroxisome                                 | (D)            | Golgi body               |
| 128  | DNA            | content is doubled in stage of             | f cell divisio | n C                      |
| 120. | $(\mathbf{A})$ | Pronhase                                   | (R)            | Metanhase                |
|      | $(\mathbf{C})$ | G, phase                                   | (D)            | S- phase                 |
| 120  |                | of individuals of different species is     | allad          | 5 phuse                  |
| 129. | A git (A)      | Population                                 | (P)            | Community                |
|      | $(\mathbf{A})$ | Biome                                      | (D)            | None of these            |
| 120  | (C)<br>D       | Diome                                      | (D)            | None of these            |
| 130. | Purin          | A dening and Comming                       | <b>(D</b> )    | Coursing and Costa sing  |
|      | (A)            | Adenine and Guanine                        | (B)            | Guanine and Cytosine     |
|      | (C)            | I nymine and Cytocine                      | (D)            | Adenine and Thymine      |
| 131. | The p          | bigment which is absent in chloroplast is  | ·              |                          |
|      | (A)            | Chlorophyll 'a'                            | (B)            | Chlorophyll 'b'          |
|      | (C)            | Xanthphyll                                 | (D)            | Anthocyanine             |
| 132. | Rate           | of transpiration is measured by            |                |                          |
|      | (A)            | Manometer                                  | (B)            | Potometer                |
|      | (C)            | Auxanometer                                | (D)            | None of these            |
| 133. | The s          | site of primary photochemical reaction is  |                |                          |
|      | (A)            | Stroma                                     | (B)            | Grana                    |
|      | (C)            | Periplast cavity                           | (D)            | Inner layer              |
| 134. | Fathe          | er of green revolution in India is         |                |                          |
|      | (A)            | N. Borlaug                                 | (B)            | K.C. Mehta               |
|      | (C)            | M.S. Swaminathan                           | (D)            | None of these            |
| 135. | Plant          | s which grow in shade are                  |                |                          |
|      | (A)            | Sciophytes                                 | (B)            | Heliophytes              |
|      | (C)            | Halophytes                                 | (D)            | Psamophytes              |
| 136. | The a          | mount of living material in different trop | phic levels i  | s called                 |
|      | (A)            | Standing crop                              | (B)            | Standing state           |
|      | (C)            | Dry weight                                 | (D)            | Biomass                  |
| 137  | In no          | nd ecosystem pyramid of number is alway    | avs            |                          |
| 137. | (A)            | Straight                                   | (B)            | Linear                   |
|      | (C)            | Upright                                    | (D)            | Inverted                 |
| 138  | Vere           | tation dominated by shrubs with few tall   | trees is cal   | led                      |
| 156. | (A)            | Serule                                     | (B)            | Marsh                    |
|      | $(\mathbf{A})$ | Grassland                                  | (D)            | Forest                   |
| 120  | (C)<br>T-t-1   |  | (D)            | Torest                   |
| 139. | 1  otal        | energy produced during photosynthesis      | is called      | Nathiamaga               |
|      | (A)            | Not primary production                     | (D)            | Gross primery production |
| 1.40 | (U)<br>C       |  | (D)            | Gross primary production |
| 140. | Seco           | ndary producers of the ecosystem are       |                | D.:                      |
|      | (A)            | Green plants                               | (B)            | Primary consumers        |
|      | (C)            | 1 op consumers                             | (D)            | inone of these           |

| 141. | The c        | hemical knives of DNA are                        |            |                                     |
|------|--------------|--|------------|-------------------------------------|
|      | (A)          | Ligases  | (B)        | Polymerases                         |
|      | (C)          | Endonucleases                                    | (D)        | Transcriptases                      |
| 142. | The Ir       | ndian variety of rice patented by an American    | n comp     | bany is                             |
|      | (A)          | IR 8   | (B)        | Jaya                                |
|      | (C)          | Sona masoori                                     | (D)        | Basmati                             |
| 143  | Pusa I       | Komal is a variety of                            |            |                                     |
| 115. | (A)          | Cowpea   | (B)        | Wheat                               |
|      | (C)          | Brassica   | (D)        | Chilli                              |
| 144. | The st       | talk of the ovule that attaches it to the placen | ta in ar   | ngiosperms is                       |
|      | (A)          | Pedicel  | (B)        | Funiculus                           |
|      | (C)          | Integument                                       | (D)        | Hilum                               |
| 145. | Vallis       | neria usually favours                            |            |                                     |
|      | (A)          | Zoophily   | (B)        | Entomophily                         |
|      | (C)          | Hydrophily                                       | (D)        | Anemophily                          |
| 146. | An ex        | ample of single cell protein is                  |            |                                     |
|      | (A)          | Spirulina  | (B)        | Volvox                              |
|      | (C)          | Spirogyra  | (D)        | Chlamydomonas                       |
| 147  | Whiel        | h forest is named as the "Lungs of the planet"   | "?<br>``?  | 5                                   |
| 1    | (A)          | Western ghats                                    | (B)        | Eastern ghats                       |
|      | (C)          | Amazon rain forest                               | (D)        | Sahara desert                       |
| 148. | The e        | arth summit held at Rio de Janeiro was in the    | e year     |                                     |
|      | (A)          | 1986   | (B)        | 1902                                |
|      | (C)          | 1992   | (D)        | 1996                                |
| 149. | Lignit       | fied cell wall occurs in                         |            |                                     |
|      | (A)          | Epidermal cells                                  | (B)        | Cambial cells                       |
|      | (C)          | Phloem cells                                     | (D)        | Xylem cells                         |
| 150. | A slid       | e of TS dicot stem shows                         |            |                                     |
|      | (A)          | Scattered vascular bundles                       | (B)        | Vascular bundles arranged in a ring |
|      | (C)          | Radial vascular bundles                          | (D)        | Closed vascular bundles             |
| 151. | Once         | formed, red blood cells normally have an ave     | erage l    | ife span of                         |
|      | (A)          | 30 days  | (B)        | 60 days                             |
| 1.50 | (C)<br>11    | 90 days  | (D)        | 120 days                            |
| 152. | Hepar        | In, an anticoagulant is manufactured by          | <b>(D)</b> | Most colla                          |
|      | (A)          | Plasma cells<br>Lymphocytes                      | (B)<br>(D) | Masi cells<br>Blood platelets       |
| 152  | (C)<br>Eunot | Lymphocyces                                      | (D)        | Blood placets                       |
| 133. | $(\Delta)$   | Provide support only                             | (B)        | Provide support and production of   |
|      | (A)          | Trovide support only                             | (D)        | RBC only                            |
|      | (C)          | Provide support and production of WBC            | (D)        | Provide support and production of   |
|      | (-)          | only   | (-)        | RBC and WBC                         |
| 154. | Binoc        | ular vision is seen in                           |            |                                     |
| -    | (A)          | Man  | (B)        | Rabbit                              |
|      | (C)          | Rat  | (D)        | Guinea pig                          |
| 155. | Spern        | natogenesis is influenced by                     |            |                                     |
|      | (Â)          | Testosterone                                     | (B)        | Luteinizing hormone                 |
|      | (C)          | FSH  | (D)        | All of these                        |
|      |              |  |            |                                     |

| 156. | The type of respiration found in man is |   |                |   |  |  |  |  |
|------|---|---|----------------|---|--|--|--|--|
|      | (A)                                     | Cutaneous                                       | (B)            | Subcutaneous  |  |  |  |  |
|      | (C)                                     | Pulmonary                                       | (D)            | Diffusion   |  |  |  |  |
| 157. | What                                    | happens if RBCs are put in a hypertonic solu    | tion           |   |  |  |  |  |
|      | (A)                                     | They will contract and loose water              | (B)            | They will swell up and burst  |  |  |  |  |
|      | (C)                                     | They will show clumping                         | (D)            | None of these   |  |  |  |  |
| 158. | In mar                                  | n, urea is formed in the                        |                |   |  |  |  |  |
|      | (A)                                     | Body tissues                                    | (B)            | Kidney  |  |  |  |  |
|      | (C)                                     | Liver   | (D)            | Spleen  |  |  |  |  |
| 159. | Which                                   | n of the following stood erect first            |                |   |  |  |  |  |
|      | (A)                                     | Java man  | (B)            | Peking man  |  |  |  |  |
|      | (C)                                     | Australopithecus                                | (D)            | Cro-Magnon man  |  |  |  |  |
| 160  | The fi                                  | rst autotrophs on the earth were                | Ì,             |   |  |  |  |  |
| 1001 | (A)                                     | Viruses   | (B)            | Bacteria  |  |  |  |  |
|      | (C)                                     | Green algae                                     | (D)            | Blue green algae  |  |  |  |  |
| 161  | The 'I                                  | Ise and disuse' principle of evolution was pro  | nnsec          | t by  |  |  |  |  |
| 101. | (A)                                     | Lamarck   | (B)            | Weisman   |  |  |  |  |
|      | $(\mathbf{C})$                          | Hugo de Vries                                   | (D)            | Charles Darwin  |  |  |  |  |
| 162  | The fo                                  | sllowing is an example of inhorn error in met   | abolis         | m   |  |  |  |  |
| 102. | $(\Delta)$                              | Spina bifida                                    | $(\mathbf{R})$ | Phenylketonuria   |  |  |  |  |
|      | $(\mathbf{C})$                          | Phocomelia                                      | (D)            | Mongolism   |  |  |  |  |
| 162  | (e)<br>Idantii                          | al twing develop from                           | (2)            | in ongoing in the second se |  |  |  |  |
| 105. | $(\Lambda)$                             | One oxum and two sperms                         | $(\mathbf{B})$ | Two ova and one sperm   |  |  |  |  |
|      | $(\mathbf{A})$                          | Two ova and two sperms                          | $(\mathbf{D})$ | None of these   |  |  |  |  |
| 164  |   | Two ova and two sperms                          | (D)            | of mitagia  |  |  |  |  |
| 164. | 1  ne cr                                | Promosomes are best studied at the following    | stage          | OI MILOSIS<br>Matanhaga   |  |  |  |  |
|      | (A)                                     | Anophase  | (B)            | Telephase   |  |  |  |  |
| 165  | (C)                                     |   | (D)            | Telophase   |  |  |  |  |
| 165. | A mor                                   | nosomic individual can be mathematically rep    | oresen         | ted as  |  |  |  |  |
|      | (A)                                     | 2n-2  | (B)            | 2n+1  |  |  |  |  |
|      | (C)                                     | 2n-1  | (D)            | 20-4  |  |  |  |  |
| 166. | In a fr                                 | uit fly, a white eyed XXY female is mated to    | a red          | eyed XY male. The female progeny  |  |  |  |  |
|      | (A)                                     | All red eved                                    | (B)            | All white eved  |  |  |  |  |
|      | $(\mathbf{C})$                          | Mainly red eved with a few white eved           | (D)            | Mainly white eved with a few red eved   |  |  |  |  |
| 167  | $(\mathbf{c})$                          | f the following is a say linked trait in humans | (2)            |   |  |  |  |  |
| 107. | $(\Lambda)$                             | Curly bairs                                     | ( <b>P</b> )   | Sickle call anomia  |  |  |  |  |
|      | $(\mathbf{A})$                          | Colour blindness                                | $(\mathbf{D})$ | Down's syndrome   |  |  |  |  |
| 1(0  | (C)                                     | colour billioness                               | (D)            | Down's syndrome   |  |  |  |  |
| 168. | First $e$                               | Nironhoro                                       | $(\mathbf{P})$ | U.C. Khorene  |  |  |  |  |
|      | $(\mathbf{A})$                          | Wetcon  | (B)            | H.G. Knorana  |  |  |  |  |
|      | (C)                                     | watson  | (D)            | F.H.C. Crick  |  |  |  |  |
| 169. | Protein                                 | n coat virus is known as                        |                |   |  |  |  |  |
|      | (A)                                     | Capsid  | (B)            | Capsomere   |  |  |  |  |
|      | (C)                                     | VIIION  | (D)            | v iroid   |  |  |  |  |
| 170. | Chemi                                   | ically a gene is                                | ( <b>—</b> )   |   |  |  |  |  |
|      | (A)                                     | Nucleoprotein                                   | (B)            | Polypeptide   |  |  |  |  |
|      | (C)                                     | Ribonucleic acid                                | (D)            | Polynucleotide  |  |  |  |  |

| 171. | Apes      | differ from man in having                      |                |                                     |
|------|-----------|--|----------------|-------------------------------------|
|      | (Å)       | Arms shorter than legs                         | (B)            | Legs shorter than arms              |
|      | (C)       | Length of arms and legs is similar             | (D)            | A tail                              |
| 172. | The d     | lisease transmitted through sexual contact is  |                |                                     |
|      | (A)       | Measles  | (B)            | Syphilis                            |
|      | (C)       | Polio  | (D)            | Small pox                           |
| 173. | Нуре      | rsensitivity of tissue occurs in               |                |                                     |
|      | (A)       | Cancer   | (B)            | Malaria                             |
|      | (C)       | Allergy  | (D)            | Small pox                           |
| 174. | The s     | porozoites of malarial parasites are stored in |                |                                     |
|      | (A)       | Liver of man                                   | (B)            | Blood of man                        |
|      | (C)       | Stomach of females anopheles                   | (D)            | Salivary glands of female anopheles |
| 175. | The f     | ollowing plant has male and female reproduc    | tive pa        | arts in the same flower             |
|      | (A)       | Papaya   | (B)            | Datepalm                            |
|      | (C)       | Cycas  | (D)            | Datura                              |
| 176. | Opiu      | m is derived from                              |                |                                     |
|      | (A)       | Latex of Papaver somniferum                    | (B)            | Seeds of Papaver somniferum         |
|      | (C)       | Seeds of <i>Coffee arabica</i>                 | (D)            | Leaves of datura                    |
| 177. | Penic     | cillium was first isolated from                |                |                                     |
|      | (A)       | Penicillium nigricans                          | (B)            | Penicillium chrysogenum             |
|      | (C)       | Penicillium notatum                            | (D)            | Penicillum griseofulvum             |
| 178. | Whic      | h of the following is an implant?              |                |                                     |
|      | (A)       | Blood diasyser                                 | (B)            | Heart valve                         |
|      | (C)       | Artificial limbs                               | (D)            | Oxygenator                          |
| 179. | Chem      | nical nature of jute fibre is                  |                |                                     |
|      | (A)       | Lignin   | (B)            | Cellulose                           |
|      | (C)       | Pectin   | (D)            | Suberin                             |
| 180. | The c     | conversion of molecular nitrogen to ammonia    | is kno         | wn as                               |
|      | (A)       | Nitrification                                  | (B)            | Denitrification                     |
|      | (C)       | Ammonification                                 | (D)            | Nitrogen fixation                   |
| 181. | Cocai     | ine is a powerful stimulant of                 |                |                                     |
|      | (A)       | Heart beat                                     | (B)            | Central nervous system              |
|      | (C)       | Muscles  | (D)            | Breathing                           |
| 182. | Diagr     | nosis of typhoid is done by                    |                |                                     |
|      | (A)       | ESR  | (B)            | ELISA test                          |
|      | (C)       | DLC  | (D)            | WIDAL test                          |
| 183. | Scien     | tific study of human population is called      |                |                                     |
|      | (A)       | Demography                                     | (B)            | Geography                           |
|      | (C)       | Anthropology                                   | (D)            | Biogeography                        |
| 184. | Vineg     | gar is obtained due to biological activity of  | <b>(D)</b>     | T / 1 '11                           |
|      | (A)       | Acetobactor                                    | (B)            |                                     |
| 105  | (C)       |  | (D)            | Anabaena                            |
| 185. | The f     | ollowing disease involves change in chromos    | ome n          | umber                               |
|      | (A)       | Colour blindness                               | (B)            | Haemophilia                         |
| 107  | (U)<br>D' |  | (D)            | Jaunaice                            |
| 186. | King      | worm disease is caused by                      | $(\mathbf{D})$ |                                     |
|      | (A)       | Annella<br>A fungue                            | (B)            | Heimintnes                          |
|      | (C)       | A rungus                                       | (D)            | A bacterium                         |

| 187. | The o<br>(A)        | pen type of circulatory system is found in<br>Nereis<br>Prawn | (B)<br>(D)            | Octopus<br>Frog         |
|------|---------------------|---|-----------------------|-------------------------|
| 188. | (C)<br>The p<br>(A) | rocess of translation is<br>Ribosome synthesis                | (B)                   | Protein synthesis       |
| 100  | (C)                 | DNA synthesis   | (D)                   | RNA synthesis           |
| 189. | Dengu<br>(A)        | Culex   | (B)                   | Male anopheles          |
|      | (C)                 | Aedes   | (D)                   | Female anopheles        |
| 190. | Young               | g of cockroach is called                                      | (D)                   | Numph                   |
|      | (A) $(C)$           | Maggot  | (D)                   | Juvenile                |
| 191. | Numb                | per of mitotic divisions required to produce 12               | 28 cell               | s from a single cell is |
|      | (A)                 | 7   | (B)                   | 14                      |
| 102  | (C)<br>Distar       | 10 $10$   | (D)<br>NA is          | 52                      |
| 192. | (A)                 | 2.4 A°  | (B)                   | 3.4 A°                  |
|      | (C)                 | 24 A°   | (D)                   | $34 \text{ A}^{\circ}$  |
| 193. | In add              | lition to the nucleus, DNA also occurs in                     |                       |                         |
|      | (A)                 | Mitochondria  | (B)                   | Lysosome                |
| 104  | (C)                 | Ribosome  | (D)                   | Golgi appratus          |
| 194. | (A)                 | Bacteria  | (B)                   | Diatoms                 |
|      | (C)                 | Cyanobacteria   | (D)                   | Green algae             |
| 195. | The v               | ector for causing sleeping sickness in man is                 |                       |                         |
|      | $(\mathbf{A})$      | House fly   | (B)                   | Tse-Tse fly             |
| 107  | (C)<br>Classe       | Butterfly   | (D)                   | Mosquito                |
| 196. | (A)                 | Saffranine  | (B)                   | Acetocarmine            |
|      | (C)                 | Sciff's reagent   | (D)                   | Ethanol                 |
| 197. | The u               | niversal recipient blood group is                             |                       |                         |
|      | (A)                 | A   | (B)                   | AB                      |
| 100  | (C)                 |   | (D)                   | В                       |
| 198. | Arsen               | Ic pollutant in drinking water causes                         | $(\mathbf{R})$        | Paralysis               |
|      | $(\mathbf{C})$      | Kidney diseases   | (D)                   | Cancer                  |
| 199. | In the              | colony of <i>Apis indica</i> , the one formed by par          | theno                 | genesis is              |
|      | (A)                 | Queen   | (B)                   | Worker                  |
|      | (C)                 | Drone   | (D)                   | Both B and C            |
| 200. | The p               | ollutant responsible for chromosomal mutatio                  | ons in $(\mathbf{D})$ | man is                  |
|      | (A)<br>(C)          | Lead<br>Arsenic   | (D)<br>(B)            | Manganese               |
|      | $(\mathbf{U})$      |   | $(\mathbf{D})$        | wiereur y               |

| Sr. | Question  |                     |  |
|-----|---|---------------------|--|
| No. |   |                     |  |
| 1.  | Among the following, the most stable complex is $(1) = \sum_{i=1}^{n} (1) \sum_{j=1}^{n} (1) \sum_{i=1}^{n} (1) \sum_{i=1$ |                     |  |
|     | (A) [Fe (H <sub>2</sub> O) <sub>6</sub> ] <sup>3</sup>  | (B)                 | $[Fe (NH_3)_6]^{5}$  |
| _   | (C) [Fe $(C_2O_4)_3$ ]  | (D)                 | $[Fe (Cl)_6]^3$  |
| 2.  | Which is the correct coordination number (C.N) a metal atom in $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?   | ind oxic            | lation number (O.N) of the transition  |
|     | (A) $C.N=3, O.N=+1$   | (B)                 | C.N=4, O.N=+2  |
|     | (C) $C.N=6, O.N=+1$   | (D)                 | C.N=6, O.N=+3  |
| 3.  | In a solid, oxide ions are arranged in ccp, cations cation B occupy one third of the octahedral voids.  | A occuj<br>. The fo | py one sixth of the tetrahedral voids and<br>rmula of the solid is:                            |
|     | $(A)  ABO_3$ $(C)  ABO$   | (B)                 |  |
| 4   | $(C) AD_{3}O$   | (D)                 | $A_3D_3O_3$  |
| 4.  | Which of the following statements is correct about  | it the ab           | nds between methanol molecules break.  |
|     | (A) At specific composition methanol acetone  | (B)                 | At specific composition methanol   |
|     | mixture will form minimum boiling   |                     | bailing agastrong and show positive  |
|     | from Baoult's law   |                     | deviation from Racult's law  |
|     | (C) At specific composition methanol acetone  | $(\mathbf{D})$      | At specific composition methanol   |
|     | mixture will form minimum boiling   | (D)                 | acetone mixture will form maximum  |
|     | azeotrope and show negative deviation   |                     | boiling azeotrope and show negative  |
|     | from Raoult's law   |                     | deviation from Raoult's law  |
| 5.  | $K_{\rm H}$ value for argon, carbon dioxide, formaldehydd<br>and 0.413, respectively. The correct arrangement<br>solubility is:   | e and m<br>of these | ethane gases are 40.39, 1.67, 1.83 X 10 <sup>-5</sup> e gases in the order of their increasing |
|     | (A) formaldehyde <methane<carbon< th=""><th>(B)</th><th>formaldehyde&lt; carbon dioxide</th></methane<carbon<>  | (B)                 | formaldehyde< carbon dioxide   |
|     | dioxide <argon< td=""><td></td><td><methane<argon< td=""></methane<argon<></td></argon<>  |                     | <methane<argon< td=""></methane<argon<>  |
|     | (C) argon <carbon dioxide<<="" td=""><td>(D)</td><td>argon <methane <carbon="" dioxide<="" td=""></methane></td></carbon>   | (D)                 | argon <methane <carbon="" dioxide<="" td=""></methane>   |
|     | methane <formaldehyde< td=""><td></td><td><formaldehyde< td=""></formaldehyde<></td></formaldehyde<>  |                     | <formaldehyde< td=""></formaldehyde<>  |
| 6.  | The number of faradays of electricity required for nitrobenzene to aniline is:  | · electro           | lytic conversion of the mole of  |
|     | (A) 3F  | (B)                 | 4F   |
|     | (C) 6F  | (D)                 | 5F   |
| 7.  | The positive value of the standard electrode poten  | tial of A           | Ag <sup>+</sup> /Ag indicates that:  |
|     | (A) This redox couple is a stronger reducing agent than $H^+/H_2$ couple  | (B)                 | This redox couple is a stronger oxidizing agent than $H^+/H_2$ couple                          |
|     | (C) Ag can displace $H_2$ from acid   | (D)                 | Ag can displace $H_2$ from base  |
| 8.  | Milk is refrigerated in order to slow the rate of de reaction rate is due to:   | compos              | sition by bacterial action. The decrease in  |
|     | (A) A decrease in surface area  | (B)                 | A decrease in $\triangle$ H for the reaction   |
|     | (C) A decrease in the fraction of particles   | (D)                 | The introduction of an alternative   |
|     | possessing sufficient energy  |                     | pathway with greater activation energy.  |
| 9.  | Which of the following statements is not correct?   |                     |  |
|     | (A) The rate of a reaction decreases with   | (B)                 | The instantaneous rate a reaction is   |
|     | passage of time as concentration of   |                     | same at any time during the reaction   |
|     | reactants decrease  |                     |  |
|     | (C) For a zero order reaction the concentration of reactants remains  | (D)                 | The rate of a reaction decreases with increase in concentration of reactant (s)                |
|     | changed with passage of time  |                     |  |

| 10. | Which of the following gases shows the lowest adsorption per gram of charcoal? The critical |  |                    |   |
|-----|---|--|--------------------|---|
|     | tempe   | ratures are given in parentnesis:  | <b>(D)</b>         |   |
|     | (A)   | $H_2(33K)$   | (B)                | $CH_4(190K)$  |
|     | (C)   | $SO_2(630K)$   | (D)                | $CO_2(304K)$  |
| 11. | Freun statem  | dlich adsorption isotherm is given by the exp.<br>nents are false?                     | ressio             | $n x/m = kp^{1/n}$ . Which of the following   |
|     | i.  | When $1/n=0$ , the adsorption is indepen   | dent o             | f pressure.   |
|     | ii.   | When n=0, the plot of $x/m$ vs p graph i   | s a lin            | e parallel to x axis.   |
|     | iii   | When 1/n=0, the adsorption is directly   | propo              | rtional to pressure.  |
|     | iv  | When $n=0$ , plot of $x/m$ vs p is a curve   |                    | _   |
|     | (A)   | i and ii   | (B)                | ii and iv   |
|     | (C)   | i and iii  | (D)                | all are false   |
| 12. | In the  | extraction of chlorine by electrolysis of an ac  | queous             | s solution of sodium chloride, which of   |
|     | the fo  | llowing statements are true?   | -                  |   |
|     | i.  | $\Delta G^0$ for the overall reaction is positiv                                       | e                  |   |
|     | ii.   | $\Delta G^0$ for the overall reaction is negative                                      | ve                 |   |
|     | iii   | $E^0$ for the overall reaction is positive   |                    |   |
|     | iv  | $E^0$ for the overall reaction is negative   |                    |   |
|     | (A)   | i and iv   | (B)                | i and iii   |
|     | (C)   | ii and iii   | (D)                | iii and iv  |
| 13. | Which   | n of the following pairs of ions are isoelectror                                       | nic and            | l isostructural ?   |
|     | (A)   | $NO_2^+$ and $NO_3^-$  | (B)                | $ClO_3$ and $ICl_4$   |
|     | (C)   | $XeO_3^{2-}$ and $PCl_3$   | (D)                | $\text{ClO}_3^-$ and $\text{SO}_3^{2-}$   |
| 14. | Which   | n of the following hydrides is the strongest re-                                       | ducing             | g agent?  |
|     | (A)   | NH <sub>3</sub>  | (B)                | PH <sub>3</sub>   |
|     | (C)   | AsH <sub>3</sub>   | (D)                | SbH <sub>3</sub>  |
| 15. | Consi   | der the reactions,   |                    |   |
|     | i.  | $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (N)$  | $(O_3)_2 +$        | $-X + H_2O$   |
|     | ii.   | $Zn + dil. HNO_3 (cold) \longrightarrow Zn (N)$  | $IO_3)_2$ -        | $+Y + H_2O$   |
|     | ( )   | Compounds X and Y are, respectively  |                    |   |
|     | (A)   | $N_2O, NO$   | (B)                | $NO_2, NO_2$  |
|     | (C)   | $N_2, N_2O$  | (D)                | $NO_2$ , $NO$   |
| 16. | When  | KMnO <sub>4</sub> acts as an oxidizing agent in weakly                                 | alkali             | ne medium, the oxidation number of  |
|     | manga   | anese decreases by:  |                    |   |
|     | (A)   |  | (B)                | 2   |
|     | (C)   | 3  | (D)                | 5   |
| 17. | Acidit  | fied potassium dichromate solution turns gree  | en whe             | In $Na_2SO_3$ is added to it due to the   |
|     | forma   | tion of:   |                    |   |
|     | (A)   | $\operatorname{CrSO}_4$  | (B)                | $Cr_2(SO_4)_3$  |
|     | (C)   | $CrO_4^2$  | (D)                | $Cr_2(SO_3)_3$  |
| 18. | The d   | -electron configurations of Cr <sup>2+</sup> , Mn <sup>2+</sup> , Fe <sup>2+</sup> and | nd Co <sup>2</sup> | are d <sup>-</sup> , d <sup>-</sup> , d <sup>o</sup> and d <sup>'</sup> , respectively. |
|     | Which   | n one of the following complexes will exhibit  | minin              | num paramagnetic behavior? (atomic  |
|     | numb  | ers of Cr=24, Mn=25, Fe=26, Co=27)   |                    | $D ( (U ) ) ^{2+}$  |
|     | (A)   | $[\operatorname{Cr}(\operatorname{H}_2\operatorname{O})_6]^{2^+}$                      | (B)                | $[Mn(H_2O)_6]^{2+}$   |
|     | (C)   | $[Fe(H_2O)_6]^2$   | (D)                | $[Co(H_2O)_6]^{-1}$   |
| 19. | When  | 2-Bromopentane is heated with potassium et   | hoxid              | e in ethanol, the major product obtained  |
|     | 1S:   |  |                    | D (1  |
|     | (A)   | 2-Ethoxypentane  | (B)                | Pent-1-ene  |
|     | (C)   | Cis-Pent-2-ene   | (D)                | Trans-Pent-2-ene  |

2 PCB D

| 20. | Which of the following undergoes nucleophilic substitution exclusively by $S_N^{-1}$ mechnism? |   |                    |  |  |
|-----|--|---|--------------------|--|--|
|     | (A) Chloroethane   | (H  | B) Is              | sopropyl chloride  |  |
|     | (C) Chlorobenzene  | (I  | )) B               | enzyl chloride   |  |
| 21. | The number of possible   | stereoisomers for CH <sub>3</sub> CH=CH         | ICH <sub>2</sub> C | CH(Br)CH <sub>3</sub> is:                                  |  |
|     | (A) 8  | (H  | <b>B</b> ) 2       |  |  |
|     | (C) 4  | (I  | <b>D</b> ) 6       |  |  |
| 22. | 2-Methoxy-2-methylpro  | opane on heating with HI prod                   | uces:              |  |  |
|     | (A) Methanol and se  | c-propyl iodide (H                              | B) M               | fethyl iodide and tert-butyl alcohol                       |  |
|     | (C) Methyl iodide ar   | nd isobutene (I                                 | D) M               | Iethanol and tet-butyl iodide                              |  |
| 23. | The least acidic compound  | and among the following is:                     |                    |  |  |
|     | (A) o-Nitrophenol  | (H  | <b>B</b> ) m       | n-Nitrophenol  |  |
|     | (C) p-Nitrophenol  | (I  | D) P               | henol  |  |
| 24. | An alkene C <sub>7</sub> H <sub>14</sub> on red  | uctive ozonolysis gives an ald                  | ehyde              | with formula C <sub>3</sub> H <sub>6</sub> O and a ketone. |  |
|     | The ketone is:   |   |                    |  |  |
|     | (A) 2-Butanone   | (H  | 3) 2-              | -Pentanone   |  |
|     | (C) 3-Pentanone  | I)  | <b>)</b> P         | ropanone   |  |
| 25. | The increasing order of  | the rate of addition of HCN to                  | the co             | ompounds i) Formaldehyde ii)                               |  |
|     | Acetone iii) Acetophene  | one iv) benzophenone                            |                    |  |  |
|     | (A) $i < ii < iii < iv$  | (H  | 3) iv              | /< ii< iii < i   |  |
|     | (C) $iv < iii < ii < i$  | 1)  | D) iv              | ı< i≤ ii≤ iii  |  |
| 26. | The carboxylic acid that   | t does not undergo Hell-Vohla                   | rd-Zel             | linsky reaction is:  |  |
|     | (A) $CH_3COOH$   | (H  | B) (C              | CH <sub>3</sub> ) <sub>2</sub> CHCOOH                      |  |
|     | (C) $CH_3CH_2CH_2CO$   | OH (I   | D) (C              | CH <sub>3</sub> ) <sub>3</sub> CCOOH                       |  |
| 27. | NaNO <sub>2</sub> /HC  | l P/Br <sub>2</sub> NH <sub>3</sub>             |                    |  |  |
|     | $C_2H_5NH_2$ —   | $\bullet X \longrightarrow Y \longrightarrow Z$ |                    |  |  |
|     |  | (excess)  |                    |  |  |
|     | In the above sequence, 1   | Z 15:   |                    |  |  |
|     | (A) cyanoethane  | 1)  | s) et              | thanamide  |  |
| • • | (C) methanamine  | (1  | <b>)</b> Ε         | thanamine  |  |
| 28. | The attachment of whic value?  | h of the following group at par                 | a posi             | ition in aniline will raise the $K_b$                      |  |
|     | (A) $-SO_3H$   | (H  | B) –               | ОН   |  |
|     | (C) –F   | (I  | )) –               | ·Br  |  |
| 29. | Which of the following   | is an example of globular prot                  | ein?               |  |  |
|     | (A) myosin   | (H  | B) co              | ollagen  |  |
|     | (C) keratin  | (I  | D) ha              | aemoglobin   |  |
| 30. | Which one of the follow  | ving is synthesized in our body                 | ' by su            | in rays?   |  |
|     | (A) Vitamin D  | (H  | B) V               | 'itamin B  |  |
|     | (C) Vitamin K  | I)  | D) V               | Vitamin A  |  |
| 31  | Conrolactum is the is th   | e starting material for the synt                | hosis (            | of   |  |
| 51. | (A) Nylon-6  | (F  | (10.513)           | vlon6 6  |  |
|     | (C) Tervlene   |   | )) N               | [vlon 10   |  |
| 32  | The species which can a  | erve as an initiator for cationi                | r nolv             | merization is  |  |
| 52. | $(\Delta)$ I ithium alumini  | um hydride                                      | r pory             | litric acid  |  |
|     | (C) Aluminium chlo   | ride (I   | )) R               | al i   |  |
| 22  | Aspirin is on:   |   | <i>,</i> , ,       |  |  |
| 55. | $(\Delta)$ analogoio   | 1   | 2) or              | ntinvretic   |  |
|     | $(\Gamma)$ antimalarial  | 1)<br>/T  | )) R               | oth analogsic and antipyretic                              |  |
|     |  | (1  | <i>,</i> р         | our analgesie and antipyrette                              |  |

| 34. | The equivalent mass of iron in the reaction $2Fe + 3$  | $Cl_2 \rightarrow$ | • 2FeCl <sub>3</sub> is:   |
|-----|--|--------------------|--|
|     | (A) Half of its atomic mass  | (B)                | One third of its atomic mass   |
|     | (C) Same as atomic mass  | (D)                | One fourth of its atomic mass  |
| 35. | Which of the following sets of quantum numbers is  | s corre            | ct for an electron in 4f subshell?   |
|     | (A) $n=4, l=3, m=4, s=+1/2$  | (B)                | n=4, l=3, m=-4, s=-1/2   |
|     | (C) $n=4, l=3, m=+1, s=+1/2$   | (D)                | n=3, l=2, m=-2, s=+1/2   |
| 36. | The correct sequence of atomic radii is:   |                    |  |
|     | (A) Na>Mg>Al>Si  | (B)                | Al>Si>Na>Mg  |
|     | (C) Si>Al>Mg>Na  | (D)                | Si>Al>Na>Mg  |
| 37. | In which of the following, the bond angle around the   | ne cen             | tral atom is maximum?  |
|     | (A) $NH_3$   | (B)                | $\mathrm{NH_4}^+$  |
|     | (C) PCl <sub>3</sub>   | (D)                | SCl <sub>2</sub>   |
| 38. | Which of the following molecule does not exist   | . /                |  |
|     | (A) $NF_3$   | (B)                | NF <sub>5</sub>  |
|     | (C) PF <sub>5</sub>  | (D)                | $N_2H_4$   |
| 39. | If helium is allowed to expand in vacuum, it liberat   | tes hea            | it because   |
|     | (A) It is an inert gas   | (B)                | It is an ideal gas   |
|     | (C) Its critical temp. is low  | (D)                | It is a light gas  |
| 40  | i) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ ii) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ iii) $H_2(g) + x KJ$ iii) | $1/2O_{2}$         | $(g) \rightarrow H_2O(g) + y KJ$ . For the given two   |
|     | reactions,   |                    | (8)  |
|     | (A) $x > y$  | (B)                | x <y< td=""></y<>  |
|     | (C) x=y  | (D)                | x+y=0  |
| 41. | If the bond dissociation energies of XY, $X_2$ , $Y_2$ (all  | diato              | mic molecules) are in the ratio 1:1:0.5,   |
|     | respectively and $\Delta_{f}$ H of XY is -200KJmol <sup>-1</sup> , the bo  | nd dis             | sociation energy of $X_2$ will be:   |
|     | (A) $400 \text{ KJmol}^{-1}$   | (B)                | 300 KJmol <sup>-1</sup>  |
|     | (C) $200 \text{ KJmol}^{-1}$   | (D)                | 100 KJmol <sup>-1</sup>  |
| 42  | What will be the correct order of vapour pressure of   | f wate             | $r$ ethanol and ether at $30^{0}$ C? Given that  |
| 12. | among these compounds water has maximum boili  | ng noi             | nt and ether has minimum boiling point   |
|     | (A) Water <ether<ethanol< td=""><td>(B)</td><td>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<>   | (B)                | Water <ethanol<ether< td=""></ethanol<ether<>  |
|     | (C) Ether <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>   | (D)                | Ethanol <ether<water< td=""></ether<water<>  |
| 42  |  | (D)                |  |
| 43. | which of the following will occur if a 0.1M solution   | on of a            | weak acid is diluted to 0.01M at   |
|     | $(\Lambda) = [H^+]$ will decrease to 0.001M  | $(\mathbf{P})$     | nH will decrease   |
|     | (A) [A] will decrease to 0.001M<br>(C) Percentage ionization will increase   | $(\mathbf{D})$     | K will increase  |
|     | (C) Fercentage formzation with increase  | (D)                | $\mathbf{X}_{a}$ with increase   |
| 44. | which of the following species involves the transfer<br>(A) $M_{\rm PO}^{2^2}$ $M_{\rm PO}^{-2}$   | c 10 15            | $N_A$ electrons per mole of it ?   |
|     | (A) $\operatorname{MinO}_4 \to \operatorname{MinO}_4$<br>(C) $\operatorname{MinO}_2 \to \operatorname{MinO}_4$   | (B)                | $\operatorname{MinO}_4 \to \operatorname{Min}_4$ $\operatorname{Crop}_{2^-} \cdot \operatorname{Cr}_{3^+}^{3^+}$ |
|     | (C) $\operatorname{MinO}_4 \rightarrow \operatorname{MinO}_2$  | (D)                | $CrO_4 \rightarrow Cr$   |
| 45. | 30-volume hyderogen peroxide means:  |                    |  |
|     | (A) $30\%$ H <sub>2</sub> O <sub>2</sub> by volume   | (B)                | 30g of H <sub>2</sub> O <sub>2</sub> solution containing 1g of   |
|     |  |                    | it   |
|     | (C) 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$  | (D)                | 30 cm <sup>3</sup> of the solution contains one  |
|     | gas at STP   |                    | mole of $H_2O_2$   |
| 46. | The correct sequence of covalent character is repre  | sented             | by:  |
|     | (A) LiCl $<$ NaCl $<$ BeCl <sub>2</sub>  | (B)                | BeCl <sub>2</sub> <licl<nacl< td=""></licl<nacl<>  |
|     | (C) NaCl <licl< <math="">BeCl_2</licl<>  | (D)                | BeCl <sub>2</sub> <nacl<licl< td=""></nacl<licl<>  |
|     |  |                    |  |

| 47. | Whic           | h of the following is known as pyrene?         |                |                                  |
|-----|----------------|--|----------------|----------------------------------|
|     | (A)            | CCl <sub>4</sub>                               | (B)            | $CS_2$                           |
|     | (C)            | $S_2Cl_2$                                      | (D)            | Solid CO <sub>2</sub>            |
| 48. | The n          | nost stable carbocation amongst the following  | g is:          |                                  |
|     | (A)            | $(CH_3)_2CH^+$                                 | (B)            | $Ph_3C^+$                        |
|     | (C)            | CH <sub>2</sub> CH <sub>2</sub> <sup>+</sup>   | (D)            | $CH_2 = CH - CH_2^+$             |
| 10  | (C)<br>The n   | nolecule that will have dinole moment is:      | (D)            |                                  |
| τ). | $(\Delta)$     | 2 2-Dimethylpropane                            | ( <b>B</b> )   | Cis-2-Butene                     |
|     | $(\mathbf{A})$ | Trans-7-Butene                                 | $(\mathbf{D})$ | 2 2 3 3-Tetramethylbutane        |
| 50  | (C)            | a five isomeric havenes, the isomer which are  |                | two monochloringtod compound is: |
| 50. | $(\Lambda)$    | 2 Mathylpantana                                | $(\mathbf{P})$ | 2 2 Dimethylbutane               |
|     | $(\mathbf{A})$ | 2 3 Dimethylbutane                             | $(\mathbf{D})$ | n Hevane                         |
| 51  | (C)<br>Whie    | 2,5-Dimetryloutane                             | (D)            | II-Hexalle                       |
| 51. | winc<br>(A)    | Yulam yaqqala                                  | (D)            | Sieve tubes                      |
|     | $(\mathbf{A})$ | Aylelli vessels<br>Moristom                    | (D)            | Sieve tubes                      |
| 50  | (C)            | Menstein                                       | (D)            | Cork cens                        |
| 52. | Fathe          | er of taxonomy is                              |                | т.                               |
|     | (A)            | John Ray                                       | (B)            | Linnaeus                         |
|     | (C)            | Aristotie                                      | (D)            | Lamark                           |
| 53. | Whic           | h of the following has more characters in con  | nmon           |                                  |
|     | (A)            | Species  | (B)            | Genus                            |
|     | (C)            | Class  | (D)            | Division                         |
| 54. | Ricci          | a is a liverwort as it                         |                |                                  |
|     | (A)            | produces liver diseases                        | (B)            | is present in liver              |
|     | (C)            | cures liver diseases                           | (D)            | is like a flat lobed thallus     |
| 55. | Gym            | nosperms are characterized by                  |                |                                  |
|     | (A)            | Large leaves                                   | (B)            | Ciliated sperms                  |
|     | $(\mathbf{C})$ | Naked ovules                                   | (D)            | Scale leaves                     |
| 56  | (c)            | at parasite is                                 | (2)            |                                  |
| 50. | AIUU           | n parasite is                                  |                |                                  |
|     | (A)            | Cuscuta  | (B)            | Striga                           |
|     | (C)            | Brassica                                       | (D)            | loranthus                        |
| 57. | Roots          | s that grow from any part of the plant body of | her tha        | in the radicles are              |
|     | (A)            | Adventitious roots                             | (B)            | Tap roots                        |
|     | (C)            | Modified roots                                 | (D)            | Aerial roots                     |
| 58. | Paral          | lel venation is a characteristic of            |                |                                  |
|     | (A)            | Parasitic plants                               | (B)            | Xerophytic plants                |
|     | (C)            | Legumes  | (D)            | Grasses                          |
| 59. | A bis          | exual flower which never opens in its life spa | n is ca        | illed                            |
|     | (A)            | Cleistogamus                                   | (B)            | Heterogamus                      |
|     | (C)            | Homogamus                                      | (D)            | Dichogamus                       |
|     | (-)            |  |                |                                  |
| 60. | Quies          | scent centre is located in                     |                |                                  |
|     | (À)            | Shoot apex                                     | (B)            | Root apex                        |
|     | (C)            | Leaf apex                                      | (D)            | Bud apex                         |
| 61. | Caspa          | arian strips occur in the cells of             |                | -                                |
|     | (A)            | Epidermis                                      | (B)            | Exodermis                        |
|     | (C)            | Endodermis                                     | Ď              | Hypodermis                       |
|     | . /            |  |                | - 1                              |
|     |                |  |                |                                  |

| 62.   | Vascu   | lar bundles are absent in   |  |   |  |
|---|---|---|--|---|--|
|   | (A)   | Monocots  | (B)  | Dicots  |  |
|   | (C)   | Gymnosperms   | (D)  | Pteridophytes   |  |
| 63.   | Aeren   | hchyma is derived from  |  |   |  |
|   | (A)   | Parenchyma  | (B)  | Sclerenchyma  |  |
|   | (C)   | Phloem  | (D)  | Xylem   |  |
| 64.   | Vascu   | lar bundle having cambium is  |  |   |  |
|   | (A)   | closed  | (B)  | open  |  |
|   | (C)   | conjoint  | (D)  | collateral  |  |
| 65.   | What  | do vou eat in coconut   |  |   |  |
|   | (A)   | Embryo  | (B)  | Mesocarp  |  |
|   | (C)   | Entire seed   | (D)  | Fruit wall  |  |
| 66  | Phyllo  | ode is a modification of  | , í  |   |  |
|   | (A)   | Flower  | (B)  | Bud   |  |
|   | (C)   | Root  | (D)  | Petiole   |  |
| 67  | Finge   | rmillet is  |  |   |  |
| 07.   | (A)   | Eleusine  | (B)  | Setaria   |  |
|   | (C)   | Pennisetum  | (D)  | Sorghum   |  |
| 68  | Miero   | osporophyll of Cycas is equivalent to   | of   | angiosnerms   |  |
| 00.   | (A)   | Senal   | (B)  | Stamen  |  |
|   | (C)   | Ovary   | (D)  | Ovule   |  |
| 69  | Iackfi  | uit is an example of  | (-)  |   |  |
| 07.   | (A)   | Multiple fruit  | (B)  | Aggregate fruit   |  |
|   | $(\mathbf{C})$  | Simple fruit  | (D)  | None of these   |  |
| 70  | Anther wall in angiognerms contain how many wall layers   |   |  |   |  |
| 70.   | $(\mathbf{A})$  | 3   | $(\mathbf{R})$   | Δ   |  |
|   |   |   |  |   |  |
|   | $(\mathbf{C})$  | 5   | (D)  | 6   |  |
| 71  | (C)<br>If an e  | 5<br>endosperm cell of angiosperm has 36 chromo   | (D)  | 6<br>the root cell should have  |  |
| 71.   | (C)<br>If an e  | 5<br>endosperm cell of angiosperm has 36 chromo   | (D)<br>(D)<br>somes<br>(B)   | 6<br>s, the root cell should have<br>16   |  |
| 71.   | (C) If an e $(A)$ $(C)$   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4  | (D)<br>(D)<br>osomes<br>(B)<br>(D)   | 6<br>s, the root cell should have<br>16<br>24   |  |
| 71.   | (C)<br>If an e<br>(A)<br>(C)<br>A min   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by  | (D)<br>(D)<br>osomes<br>(B)<br>(D)   | 6<br>s, the root cell should have<br>16<br>24   |  |
| 71.<br>72.  | (C) If an e $(A)$ $(C)$ Amin $(A)$  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg  | (D)<br>(D)<br>osomes<br>(B)<br>(D)<br>(B)  | 6<br>s, the root cell should have<br>16<br>24<br>Cu   |  |
| 71.<br>72.  | (C) If an e $(A)$ $(C)$ Amin $(A)$ $(C)$  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn  | (D)<br>psomes<br>(B)<br>(D)<br>(B)<br>(D)  | 6<br>a, the root cell should have<br>16<br>24<br>Cu<br>Fe   |  |
| <ul><li>71.</li><li>72.</li><li>73</li></ul>  | (C) If an e $(A)$ $(C)$ Amin $(A)$ $(C)$ Numb   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>per of net gain ATP in aerobic respiration is   | (D)<br>osomes<br>(B)<br>(D)<br>(B)<br>(D)  | 6<br>s, the root cell should have<br>16<br>24<br>Cu<br>Fe   |  |
| <ul><li>71.</li><li>72.</li><li>73.</li></ul>   | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>per of net gain ATP in aerobic respiration is   | (D)<br>(D)<br>promes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)  | 6<br>a, the root cell should have<br>16<br>24<br>Cu<br>Fe<br>42   |  |
| <ul><li>71.</li><li>72.</li><li>73.</li></ul>   | (C)<br>If an c<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38  | (D)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)   | 6<br>s, the root cell should have<br>16<br>24<br>Cu<br>Fe<br>42<br>41   |  |
| <ul><li>71.</li><li>72.</li><li>73.</li><li>74</li></ul>  | (C)<br>If an c<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One of the set o    | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38  | (D)<br>(D)<br>posomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>bio res   | 6<br>5, the root cell should have<br>16<br>24<br>Cu<br>Fe<br>42<br>41<br>piration produces  |  |
| <ul><li>71.</li><li>72.</li><li>73.</li><li>74.</li></ul>   | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs  | (D)<br>posomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>bic res<br>(B)   | 6<br>a, the root cell should have<br>16<br>24<br>Cu<br>Fe<br>42<br>41<br>piration produces<br>38 ATPs   |  |
| <ul><li>71.</li><li>72.</li><li>73.</li><li>74.</li></ul>   | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs  | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>bic res<br>(B)<br>(D)                                | 6<br>5, the root cell should have<br>16<br>24<br>Cu<br>Fe<br>42<br>41<br>piration produces<br>38 ATPs<br>15 ATPs  |  |
| <ul> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> </ul>                           | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)<br>In for e  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs  | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>bic res<br>(B)<br>(D)                                | <ul> <li>6</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>6</li> <li>6</li> <li>16</li> <li>24</li> <li>24</li> <li>Cu</li> <li>Fe</li> <li>42</li> <li>41</li> <li>piration produces</li> <li>38 ATPs</li> <li>15 ATPs</li> </ul>  |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> </ol>                           | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)<br>In for  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers   | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>bic res<br>(B)<br>(D)                                | 6<br>6, the root cell should have<br>16<br>24<br>Cu<br>Fe<br>42<br>41<br>piration produces<br>38 ATPs<br>15 ATPs<br>Primary producers   |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> </ol>                           | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)<br>In for<br>(A)<br>(C)  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>elucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers  | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>bic res<br>(B)<br>(D)<br>(B)<br>(D)                  | <ul> <li>6</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>8</li> <li>7</li> <li>7</li> <li>8</li> <li>7</li> <li>8</li> <li>8</li> <li>7</li> <li>8</li> <li>8</li> <li>9</li> <li>9&lt;</li></ul> |  |
| <ul> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> <li>76.</li> </ul>              | (C)<br>If an $(A)$<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One $g$<br>(A)<br>(C)<br>In for<br>(A)<br>(C)<br>The formation of the formation o | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers  | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)                             | <ul> <li>6</li> <li>6</li> <li>a, the root cell should have 16</li> <li>24</li> <li>Cu</li> <li>Fe</li> <li>42</li> <li>41</li> <li>piration produces 38 ATPs 15 ATPs</li> <li>15 ATPs</li> <li>Primary producers None of these</li> </ul>  |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> <li>76.</li> </ol>              | (C) If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)<br>In for<br>(A)<br>(C)<br>The la  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers<br>argest cell in the embryo sac is  | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)               | <ul> <li>6</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>8</li> <li>7</li> <li>8</li> <li>7</li> <li>8</li> <li>7</li> <li>8</li> <li>7</li> <li>7&lt;</li></ul> |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> <li>76.</li> </ol>              | (C) If an a (A)<br>(C) Amin<br>(A) $(C)$ Numb<br>(A) $(C)$ One g<br>(A) $(C)$ In for<br>(A) $(C)$ The la<br>(A) $(C)$   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>success molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers<br>argest cell in the embryo sac is<br>Central cell<br>Sumeroids   | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)               | <ul> <li>6</li> <li>6</li> <li>a, the root cell should have 16</li> <li>24</li> <li>Cu</li> <li>Fe</li> <li>42</li> <li>41</li> <li>piration produces 38 ATPs 15 ATPs</li> <li>Primary producers None of these</li> <li>Egg</li> <li>None of these</li> </ul>   |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> <li>76.</li> </ol>              | (C)<br>If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)<br>In for<br>(A)<br>(C)<br>The la<br>(A)<br>(C)   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers<br>argest cell in the embryo sac is<br>Central cell<br>Synergids   | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)               | <ul> <li>6</li> <li>6</li> <li>a, the root cell should have 16</li> <li>24</li> <li>Cu</li> <li>Fe</li> <li>42</li> <li>41</li> <li>piration produces 38 ATPs 15 ATPs</li> <li>15 ATPs</li> <li>Primary producers None of these</li> <li>Egg</li> <li>None of these</li> </ul>  |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> <li>76.</li> <li>77.</li> </ol> | (C)<br>If an $(A)$<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>In for<br>(A)<br>(C)<br>In for<br>(A)<br>(C)<br>The la<br>(A)<br>(C)<br>Doubb  | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>clucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers<br>argest cell in the embryo sac is<br>Central cell<br>Synergids<br>le membrane is absent in<br>Mitachandria               | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)               | <ul> <li>6</li> <li>6</li> <li>a, the root cell should have 16</li> <li>24</li> <li>Cu</li> <li>Fe</li> <li>42</li> <li>41</li> <li>piration produces 38 ATPs 15 ATPs 15 ATPs</li> <li>Primary producers None of these</li> <li>Egg</li> <li>None of these</li> <li>Egg</li> <li>None of these</li> </ul>   |  |
| <ol> <li>71.</li> <li>72.</li> <li>73.</li> <li>74.</li> <li>75.</li> <li>76.</li> <li>77.</li> </ol> | (C)<br>If an e<br>(A)<br>(C)<br>Amin<br>(A)<br>(C)<br>Numb<br>(A)<br>(C)<br>One g<br>(A)<br>(C)<br>In for<br>(A)<br>(C)<br>The la<br>(A)<br>(C)<br>Doub<br>(A)<br>(C)   | 5<br>endosperm cell of angiosperm has 36 chromo<br>18<br>4<br>o acid synthetase enzyme is activated by<br>Mg<br>Zn<br>ber of net gain ATP in aerobic respiration is<br>2<br>38<br>slucose molecule partially oxidized in anaero<br>30 ATPs<br>2 ATPs<br>est ecosystem green plants are<br>Primary consumers<br>Decomposers<br>argest cell in the embryo sac is<br>Central cell<br>Synergids<br>le membrane is absent in<br>Mitochondria<br>Darawisome | (B)<br>(D)<br>soomes<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D)<br>(B)<br>(D) | <ul> <li>6</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>6</li> <li>6</li> <li>7</li> <li>6</li> <li>8</li> <li>7</li> <li>8</li> <li>7</li> <li>7&lt;</li></ul> |  |

| 78. | DNA content is doubled in stage of cell division                    |   |                     |                          |  |  |
|-----|---|---|---------------------|--------------------------|--|--|
|     | (A)   | Prophase                                      | (B)                 | Metaphase                |  |  |
|     | (C)   | G <sub>1</sub> phase                          | (D)                 | S- phase                 |  |  |
| 79. | A gro   | oup of individuals of different specie        | es is called        |                          |  |  |
|     | (A)   | Population                                    | (B)                 | Community                |  |  |
|     | (C)   | Biome   | (D)                 | None of these            |  |  |
| 80. | Purin   | les are                                       |                     |                          |  |  |
|     | (A)   | Adenine and Guanine                           | (B)                 | Guanine and Cytosine     |  |  |
|     | (C)   | Thymine and Cytocine                          | (D)                 | Adenine and Thymine      |  |  |
| 81. | The p   | bigment which is absent in chloropla          | ast is              |                          |  |  |
|     | (A)   | Chlorophyll 'a'                               | (B)                 | Chlorophyll 'b'          |  |  |
|     | (C)   | Xanthphyll                                    | (D)                 | Anthocyanine             |  |  |
| 82. | Rate  | of transpiration is measured by               |                     |                          |  |  |
|     | (A)   | Manometer                                     | (B)                 | Potometer                |  |  |
|     | (C)   | Auxanometer                                   | (D)                 | None of these            |  |  |
| 83. | The s   | tite of primary photochemical reacti          | on is               |                          |  |  |
|     | (A)   | Stroma  | (B)                 | Grana                    |  |  |
|     | (C)   | Periplast cavity                              | (D)                 | Inner layer              |  |  |
| 84. | Fathe   | er of green revolution in India is            |                     |                          |  |  |
|     | (A)   | N. Borlaug                                    | (B)                 | K.C. Mehta               |  |  |
|     | (C)   | M.S. Swaminathan                              | (D)                 | None of these            |  |  |
| 85. | Plant   | s which grow in shade are                     |                     |                          |  |  |
|     | (A)   | Sciophytes                                    | (B)                 | Heliophytes              |  |  |
|     | (C)   | Halophytes                                    | (D)                 | Psamophytes              |  |  |
| 86. | The amount of living material in different trophic levels is called |   |                     |                          |  |  |
|     | (A)   | Standing crop                                 | (B)                 | Standing state           |  |  |
|     | (C)   | Dry weight                                    | (D)                 | Biomass                  |  |  |
| 87. | In po   | In pond ecosystem pyramid of number is always |                     |                          |  |  |
|     | (A)   | Straight                                      | (B)                 | Linear                   |  |  |
|     | (C)   | Upright                                       | (D)                 | Inverted                 |  |  |
| 88. | Vege  | tation dominated by shrubs with few           | w tall trees is cal | led                      |  |  |
|     | (A)   | Serule  | (B)                 | Marsh                    |  |  |
|     | (C)   | Grassland                                     | (D)                 | Forest                   |  |  |
| 89. | Total   | energy produced during photosyntl             | hesis is called     |                          |  |  |
|     | (A)   | Total biomass                                 | (B)                 | Net biomass              |  |  |
|     | (C)   | Net primary production                        | (D)                 | Gross primary production |  |  |
| 90. | Seco  | ndary producers of the ecosystem at           | re                  |                          |  |  |
|     | (A)   | Green plants                                  | (B)                 | Primary consumers        |  |  |
|     | (C)   | Top consumers                                 | (D)                 | None of these            |  |  |
| 91. | The c   | chemical knives of DNA are                    |                     |                          |  |  |
|     | (A)   | Ligases                                       | (B)                 | Polymerases              |  |  |
|     | (C)   | Endonucleases                                 | (D)                 | Transcriptases           |  |  |
| 92. | The I   | ndian variety of rice patented by an          | American comp       | oany is                  |  |  |
|     | (A)   | IR 8  | (B)                 | Jaya                     |  |  |
|     | (C)   | Sona masoori                                  | (D)                 | Basmati                  |  |  |

| 93.  | Pusa Komal is a variety of                           |              |                                     |
|------|--|--------------|-------------------------------------|
|      | (A) Cowpea   | (B)          | Wheat                               |
|      | (C) Brassica   | (D)          | Chilli                              |
| 94.  | The stalk of the ovule that attaches it to the place | enta in ai   | ngiosperms is                       |
|      | (A) Pedicel  | (B)          | Funiculus                           |
|      | (C) Integument                                       | (D)          | Hilum                               |
| 95.  | Vallisneria usually favours                          |              |                                     |
|      | (A) Zoophily   | (B)          | Entomophily                         |
|      | (C) Hydrophily                                       | (D)          | Anemophily                          |
| 96.  | An example of single cell protein is                 |              |                                     |
|      | (A) Spirulina  | (B)          | Volvox                              |
|      | (C) Spirogyra  | (D)          | Chlamydomonas                       |
| 97.  | Which forest is named as the "Lungs of the plan      | et"?         |                                     |
|      | (A) Western ghats                                    | (B)          | Eastern ghats                       |
|      | (C) Amazon rain forest                               | (D)          | Sahara desert                       |
| 98.  | The earth summit held at Rio de Janeiro was in t     | he year      |                                     |
|      | (A) 1986   | (B)          | 1902                                |
|      | (C) 1992   | (D)          | 1996                                |
| 99.  | Lignified cell wall occurs in                        |              |                                     |
|      | (A) Epidermal cells                                  | (B)          | Cambial cells                       |
|      | (C) Phloem cells                                     | (D)          | Xylem cells                         |
| 100. | A slide of TS dicot stem shows                       |              |                                     |
|      | (A) Scattered vascular bundles                       | (B)          | Vascular bundles arranged in a ring |
|      | (C) Radial vascular bundles                          | (D)          | Closed vascular bundles             |
| 101. | Once formed, red blood cells normally have an a      | average l    | ife span of                         |
|      | (A) 30 days  | ( <b>B</b> ) | 60 days                             |
|      | (C) 90 days  | (D)          | 120 days                            |
| 102. | Heparin, an anticoagulant is manufactured by         |              |                                     |
|      | (A) Plasma cells                                     | (B)          | Mast cells                          |
|      | (C) Lymphocytes                                      | (D)          | Blood platelets                     |
| 103. | Function of long bones in mammals is to              |              |                                     |
|      | (A) Provide support only                             | (B)          | Provide support and production of   |
|      |  |              | RBC only                            |
|      | (C) Provide support and production of WBC            | (D)          | Provide support and production of   |
|      | only   |              | RBC and WBC                         |
| 104. | Binocular vision is seen in                          |              |                                     |
|      | (A) Man  | (B)          | Rabbit                              |
|      | (C) Rat  | (D)          | Guinea pig                          |
| 105. | Spermatogenesis is influenced by                     |              |                                     |
|      | (A) Testosterone                                     | (B)          | Luteinizing hormone                 |
|      | (C) FSH  | (D)          | All of these                        |
| 106  | The type of respiration found in man is              |              |                                     |
| 100. | (A) Cutaneous  | (B)          | Subcutaneous                        |
|      | (C) Pulmonary  | (D)          | Diffusion                           |
| 107  | What happens if RRCs are put in a hypertonic so      | Jution       |                                     |
| 107. | (A) They will contract and loose water               | (R)          | They will swell up and burst        |
|      | (C) They will show clumping                          | (D)          | None of these                       |
|      |  |              |                                     |

| 108. | In man, urea is formed in the<br>(A) Body tissues<br>(C) Liver  | (B)<br>(D)            | Kidney<br>Spleen  |
|------|---|-----------------------|---|
| 109. | <ul><li>Which of the following stood erect first</li><li>(A) Java man</li><li>(C) Australopithecus</li></ul>  | (B)<br>(D)            | Peking man<br>Cro-Magnon man  |
| 110. | <ul><li>The first autotrophs on the earth were</li><li>(A) Viruses</li><li>(C) Green algae</li></ul>  | (B)<br>(D)            | Bacteria<br>Blue green algae  |
| 111. | <ul><li>The 'Use and disuse' principle of evolution was p.</li><li>(A) Lamarck</li><li>(C) Hugo de Vries</li></ul>  | roposeo<br>(B)<br>(D) | d by<br>Weisman<br>Charles Darwin   |
| 112. | <ul><li>The following is an example of inborn error in me</li><li>(A) Spina bifida</li><li>(C) Phocomelia</li></ul>   | tabolis<br>(B)<br>(D) | m<br>Phenylketonuria<br>Mongolism   |
| 113. | <ul><li>Identical twins develop from</li><li>(A) One ovum and two sperms</li><li>(C) Two ova and two sperms</li></ul>   | (B)<br>(D)            | Two ova and one sperm<br>None of these  |
| 114. | <ul><li>The chromosomes are best studied at the following</li><li>(A) Prophase</li><li>(C) Anaphase</li></ul>   | g stage<br>(B)<br>(D) | of mitosis<br>Metaphase<br>Telophase  |
| 115. | <ul> <li>A monosomic individual can be mathematically re</li> <li>(A) 2n-2</li> <li>(C) 2n-1</li> </ul>   | epresen<br>(B)<br>(D) | tted as<br>2n+1<br>2n-4   |
| 116. | <ul> <li>In a fruit fly, a white eyed XXY female is mated to would be</li> <li>(A) All red eyed</li> <li>(C) Mainly red eyed with a few white eyed</li> </ul> | o a red<br>(B)<br>(D) | eyed XY male. The female progeny<br>All white eyed<br>Mainly white eyed with a few red eyed |
| 117. | One of the following is a sex linked trait in human<br>(A) Curly hairs<br>(C) Colour blindness  | (B)<br>(D)            | Sickle cell anemia<br>Down's syndrome   |
| 118. | <ul><li>First experimental evidence for triplet code was gi</li><li>(A) Nirenberg</li><li>(C) Watson</li></ul>  | iven by<br>(B)<br>(D) | H.G. Khorana<br>F.H.C. Crick  |
| 119. | <ul><li>Protein coat virus is known as</li><li>(A) Capsid</li><li>(C) Virion</li></ul>  | (B)<br>(D)            | Capsomere<br>Viroid   |
| 120. | <ul><li>Chemically a gene is</li><li>(A) Nucleoprotein</li><li>(C) Ribonucleic acid</li></ul>   | (B)<br>(D)            | Polypeptide<br>Polynucleotide   |
| 121. | <ul> <li>Apes differ from man in having</li> <li>(A) Arms shorter than legs</li> <li>(C) Length of arms and legs is similar</li> </ul>                        | (B)<br>(D)            | Legs shorter than arms<br>A tail  |
| 122. | <ul><li>The disease transmitted through sexual contact is</li><li>(A) Measles</li><li>(C) Polio</li></ul>   | (B)<br>(D)            | Syphilis<br>Small pox   |

| 123.  | Нуре           | rsensitivity of tissue occurs in               |                       |                                     |
|-------|----------------|--|-----------------------|-------------------------------------|
|       | (A)            | Cancer   | (B)                   | Malaria                             |
|       | (C)            | Allergy  | (D)                   | Small pox                           |
| 124.  | The s          | porozoites of malarial parasites are stored in |                       |                                     |
|       | (A)            | Liver of man                                   | (B)                   | Blood of man                        |
|       | (C)            | Stomach of females anopheles                   | (D)                   | Salivary glands of female anopheles |
| 125.  | The f          | ollowing plant has male and female reproduc    | tive pa               | arts in the same flower             |
|       | (A)            | Papaya   | (B)                   | Datepalm                            |
|       | (C)            | Cycas  | (D)                   | Datura                              |
| 126.  | Opiu           | m is derived from                              |                       |                                     |
|       | (A)            | Latex of Papaver somniferum                    | (B)                   | Seeds of Papaver somniferum         |
|       | (C)            | Seeds of <i>Coffee arabica</i>                 | (D)                   | Leaves of datura                    |
| 127.  | Penic          | cillium was first isolated from                |                       |                                     |
|       | (A)            | Penicillium nigricans                          | (B)                   | Penicillium chrysogenum             |
|       | (C)            | Penicillium notatum                            | (D)                   | Penicillum griseofulvum             |
| 128.  | Whic           | h of the following is an implant?              |                       |                                     |
|       | (A)            | Blood diasyser                                 | (B)                   | Heart valve                         |
|       | (C)            | Artificial limbs                               | (D)                   | Oxygenator                          |
| 129.  | Chem           | nical nature of jute fibre is                  |                       |                                     |
|       | (A)            | Lignin   | (B)                   | Cellulose                           |
|       | (C)            | Pectin   | (D)                   | Suberin                             |
| 130.  | The c          | onversion of molecular nitrogen to ammonia     | is kno                | wn as                               |
|       | (A)            | Nitrification                                  | (B)                   | Denitrification                     |
|       | (C)            | Ammonification                                 | (D)                   | Nitrogen fixation                   |
| 131.  | Coca           | ine is a powerful stimulant of                 |                       |                                     |
|       | (A)            | Heart beat                                     | (B)                   | Central nervous system              |
| 1.2.0 | (C)            | Muscles  | (D)                   | Breatning                           |
| 132.  | Daigr          | nosis of typhoid is done by                    | <b>(D)</b>            |                                     |
|       | (A)            | ESR<br>DLC                                     | (B)                   | ELISA test                          |
| 122   | (C)            |  | (D)                   | widal test                          |
| 133.  | Scien          | tific study of human population is called      | <b>(D)</b>            | Casamanha                           |
|       | (A)            | Anthropology                                   | (B)                   | Geography                           |
| 124   | (C)            |  | (D)                   | Biogeography                        |
| 134.  | Vineg          | activity of A activity of                      | <b>(D</b> )           | Lastahasillus                       |
|       | (A)            | Nostoc   | (D)                   | Anabaena                            |
| 125   |                |  | (D)                   |                                     |
| 135.  | 1  he  1       | Colour blindness                               | some n $(\mathbf{P})$ | Umber<br>Haamanhilia                |
|       | (A)            | Down's syndrome                                | (D)                   | Jaundice                            |
| 126   |                |  | (D)                   | Jaunalee                            |
| 130.  | $(\Lambda)$    | Annelid  | ( <b>P</b> )          | Helminthes                          |
|       | $(\mathbf{A})$ | A fungus                                       | $(\mathbf{D})$        | A bacterium                         |
| 127   |                | A lungus                                       | (D)                   | A bacterium                         |
| 137.  | $(\Lambda)$    | Norois   | ( <b>P</b> )          | Octopus                             |
|       | $(\mathbf{A})$ | Drawn  | $(\mathbf{D})$        | Frog                                |
| 120   | (C)<br>The r   | records of translation is                      | (D)                   | 1105                                |
| 138.  | $(\Lambda)$    | Ribosome synthesis                             | $(\mathbf{R})$        | Protein synthesis                   |
|       | (A)            | DNA synthesis                                  | (D)                   | RNA synthesis                       |
|       |                | Divis Synthesis                                | (D)                   | 1X1 V2 1 Synthesis                  |

| 139. | Deng           | ue is transmitted by                            |         |  |
|------|----------------|---|---------|--|
|      | (A)            | Culex   | (B)     | Male anopheles                                     |
|      | (C)            | Aedes   | (D)     | Female anopheles                                   |
| 140. | Youn           | g of cockroach is called                        |         |  |
|      | (A)            | Ephyra  | (B)     | Nymph  |
|      | (C)            | Maggot  | (D)     | Juvenile   |
| 141. | Numb           | per of mitotic divisions required to produce 12 | 28 cell | s from a single cell is                            |
|      | (A)            | 7   | (B)     | 14   |
|      | (C)            | 16  | (D)     | 32   |
| 142. | Distar         | nce between two adjacent nitrogen bases of D    | NA is   |  |
|      | (A)            | 2.4 A <sup>o</sup>                              | (B)     | 3.4 A <sup>o</sup>                                 |
|      | (C)            | 24 A <sup>o</sup>                               | (D)     | 34 A <sup>o</sup>                                  |
| 143. | In add         | lition to the nucleus, DNA also occurs in       |         |  |
|      | (A)            | Mitochondria                                    | (B)     | Lysosome   |
|      | (C)            | Ribosome  | (D)     | Golgi appratus                                     |
| 144. | First p        | photosynthetic organisms to develop on earth    | were    |  |
|      | (A)            | Bacteria  | (B)     | Diatoms  |
|      | (C)            | Cyanobacteria                                   | (D)     | Green algae  |
| 145. | The v          | ector for causing sleeping sickness in man is   |         |  |
|      | (A)            | House fly                                       | (B)     | Tse-Tse fly  |
|      | (C)            | Butterfly                                       | (D)     | Mosquito   |
| 146. | Chror          | nosomes are stained with                        |         |  |
|      | (A)            | Saffranine                                      | (B)     | Acetocarmine                                       |
|      | $(\mathbf{C})$ | Sciff's reagent                                 | (D)     | Ethanol  |
| 147  | Theu           | niversal recipient blood group is               | (2)     |  |
| 11/. | (A)            | A   | (B)     | AB   |
|      | (C)            | 0   | (D)     | B  |
| 148  | Arsen          | ic pollutant in drinking water causes           |         |  |
| 1.01 | (A)            | Liver and lung diseases                         | (B)     | Paralysis  |
|      | (C)            | Kidney diseases                                 | (D)     | Cancer   |
| 149. | In the         | colony of Apis indica, the one formed by par    | theno   | genesis is   |
|      | (A)            | Queen   | (B)     | Worker   |
|      | (C)            | Drone   | (D)     | Both B and C                                       |
| 150. | The p          | ollutant responsible for chromosomal mutation   | ons in  | man is   |
|      | (A)            | Lead  | (B)     | Manganese  |
|      | (C)            | Arsenic   | (D)     | Mercury  |
| 151. | While          | e walking on smooth surface one should take     | small   | steps to ensure                                    |
|      | (A)            | Large friction                                  | (B)     | Small friction                                     |
|      | (C)            | Larger normal force                             | (D)     | Smaller normal force                               |
| 152. | What           | happens to a vehicle travelling in an unbanke   | d curv  | ved path if the friction between the road          |
|      | and ti         | res suddenly disappears                         |         |  |
|      | (A)            | Moves along tangent                             | (B)     | Moves radially in                                  |
|      | (C)            | Moves radially out                              | (D)     | Moves along the curve                              |
| 153. | A bal          | l of mass 0.2 kg strikes an obstacle and move   | s at 60 | $9^{\circ}$ to its initial direction. If its speed |
|      | chang          | es from 20m/s to 10m/s the magnitude of imp     | oulse r | received by the ball isNs                          |
|      | (A)            | $2\sqrt{7}$                                     | (B)     | $2\sqrt{3}$  |
|      | (C)            | 2√5   | (D)     | $3\sqrt{2}$  |
|      |                |   |         |  |

154. A spacecraft of mass 2000 kg moving with 600 m/s suddenly explodes into two pieces. One piece of mass 500 kg is stationary. The velocity of other part in m/s is
(A) 600
(B) 800



156. A man of mass 40 kg is at rest between the walls. If coeff. of friction between man and wall is 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



|      | (C)  | Pressure increases   | (D)   | Pressure decreases  |
|------|--|--|---|---|
| 174. | In a g<br>(A)                              | ive process dW=0, dq is <0 then for a gas<br>Temperature increases   | (B)   | Volume decreases  |
| 173. | Specia<br>given<br>(A)<br>(C)              | fic heat of a substance depends on 1. Nature of<br>to substance<br>Only one is correct<br>All are correct  | of subs<br>(B)<br>(D)                       | Both 1 and 2 are correct<br>Only 1 and 3 are correct  |
| 172. | There<br>(A)<br>(C)                        | is a circular hole in metal plate. When the plaincreased unchanged   | ate is h<br>(B)<br>(D)                      | neated the radius of the hole becomes<br>decreased<br>depends on metal  |
| 171. | When<br>throug<br>The v<br>(A)<br>(C)      | h kerosene and coconut oil of coeff. of viscosi<br>gh the same pipe, under same pressure differe<br>olume of kerosene that flows is<br>5.5 lit<br>7.7 lit                    | ty 0.00<br>ince an<br>(B)<br>(D)            | 02 and 0.0154 Ns/m <sup>2</sup> are followed<br>ad same time collects 1 lit of coconut oil.<br>6.6 lit<br>8.8 lit       |
| 170. | A hyd<br>other<br>(A)<br>(C)               | fraulic press uses a piston of 100 cm <sup>2</sup> to exert a<br>piston that supports a mass of 2000 kg is (tak<br>100cm <sup>2</sup><br>2 x 10 <sup>4</sup> cm <sup>2</sup> | a force<br>e g = 1<br>(B)<br>(D)            | e of $10^7$ dynes on water. The area of the<br>10m/s/s)<br>$10^9$ cm <sup>2</sup><br>$2 \times 10^{10}$ cm <sup>2</sup> |
| 169. | The te<br>liquid<br>(A)<br>(C)             | erminal velocity of a spherical ball of lead of a varies with R such that V/R is constant V is constant  | radius<br>(B)<br>(D)                        | R is Vwhile falling through a viscous<br>VR is constant<br>$V/R^2$ is constant  |
| 168. | Two b<br>3/5 <sup>th</sup> c<br>(A)<br>(C) | blocks A and B float in water. A floats with 1<br>of its volume immersed. The ratio of their den<br>5:12<br>3:20   | /4 <sup>th</sup> of<br>sities<br>(B)<br>(D) | its volume immersed and B floats with<br>is<br>12:5<br>20:3   |
| 167. | The le<br>/s is (1<br>(A)<br>(C)           | evel of water in a tank is 5m. A hole 1 cm <sup>2</sup> is<br>take $g=10 \text{ m/s/s}$ )<br>$10^{-3}$<br>10   | (B)<br>(D)                                  | at the bottom. The rate of leakage in m <sup>3</sup> $10^{-4}$ $10^{-2}$  |
| 100. | of the (A) (C)                             | ir rotational K.E is<br>1:2<br>1:4   | (B)<br>(D)                                  | 2:1<br>4:1  |
| 165. | If the (A) (C)                             | velocity of C.M of a rolling body is V, then v<br>$\sqrt{2V}$<br>2V  | (B)<br>(D)                                  | y of highest point in the body will be<br>V<br>$V/\sqrt{2}$   |
| 164. | A uni<br>slippi<br>(A)<br>(C)              | form rod of mass M and length L standing ve<br>ng at the bottom. The moment of inertia will $ML^{2}/3$<br>$ML^{2}/9$   | rtically<br>be<br>(B)<br>(D)                | y on a horizontal floor falls without $ML^{2}/6$ $ML^{2}/12$  |
| 163. | 25 kg<br>requir<br>(A)<br>(C)              | of sand is deposited each second on a convey<br>red to maintain the belt in motion is<br>2600W<br>325W   | vor bel<br>(B)<br>(D)                       | t moving at 10m/s. The extra power<br>250W<br>2500W   |

| 175.  | The efficiency of carnot engine depends on  |   |
|-------|---|---|
|       | (A) Working substance   | (B) Sink temperature  |
|       | (C) Source temperature  | (D) Both B and C  |
| 176.  | A 200 turn coil of self inductance 30 mH carrie   | ies a current of 5 mA. Find the magnetic flux linked  |
|       | with each turn of coil.   | _   |
|       | (A) $7.5 \times 10^{-7} \text{Wb}$  | (B) $1.6 \times 10^{-7} Wb$   |
|       | (C) $3 \times 10^{-7} \text{Wb}$  | (D) $1.5 \times 10^{-7} \text{Wb}$  |
| 177.  | The instantaneous value of current in an AC cir   | Fircuit is I = 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first  |
|       | time the current will be maximum?   |   |
|       | (A) $1/100 \text{ s}$   | (B) $1/200 \text{ s}$   |
|       | (C) $1/500 \text{ s}$   | (D) $1 s$   |
| 178.  | What in electric system represents force in mec   | echanical system ?  |
|       | $\begin{array}{cc} (A) & L \\ (O) & 1/O \end{array}$  | (B) I   |
|       | (C) $1/C$   | (D) q   |
| 179.  | A capacitor of 1 $\mu$ F is charged with 0.01C of el  | electricity. How much energy is stored in it?   |
|       | (A) $30 J$  | (B) $40 \text{ J}$  |
|       | (C) 50 J  | (D) 60 J  |
| 180.  | An electromagnetic wave is travelling in vacuu  | um with a speed of 3 x $10^{\circ}$ m/s. Find the velocity in   |
|       | a medium having relative electric and magnetic  | ic permeability 2 and 1, respectively.  |
|       | (A) $3/\sqrt{2} \times 10^8 \text{m/s}$   | $\begin{array}{c} (B) & 1.5 \times 10^{\circ} \text{m/s} \\ (D) & \text{No sharps} \end{array}$   |
| 101   |   |   |
| 181.  | Trace the path of ray of light passing through a  | a glass prism as shown in the figure. If the  |
|       | refractive index of glass is $\sqrt{3}$ , find out the valu   | lue of angle of emergence from prism.   |
|       |   |   |
|       |   |   |
|       | 60  |   |
|       |   |   |
|       | (A) 30  | (B) 45  |
|       | (C) 60  | (D) 75  |
| 182.  | Light wave from two coherent sources of intens  | nsities in ratio 64:1 produces interference. Calculate  |
|       | the ration of maximum and minima of the inter   | erference pattern.  |
|       | (A)  8:1  | (B) $64:1$  |
|       | (C) 9.7   | (D) 81:49   |
| 183   | In young's experiment, the width of the fringes   | as obtained with light of wavelength 6000 $\Lambda^0$ is 2  |
| 165.  | mm What will be the fringe width if the entire  | re apparatus is immersed in a liquid of refractive  |
|       | index 1 33?   | te apparatus is minersed in a riquid of renderive   |
|       | (A) $1 \text{ mm}$  | (B) 1.5 mm  |
|       | (C) 2 mm  | (D) $2.5 \text{ mm}$  |
| 184   | (C) 2 mm  |   |
| 10.11 | Unpolarised light is incident on plane glass su   | urface What should be the angle of incidence in   |
|       | Unpolarised light is incident on plane glass sur<br>degrees, so that the reflected and refracted rays   | urface. What should be the angle of incidence in<br>'s are perpendicular to each other?   |
|       | Unpolarised light is incident on plane glass sur<br>degrees, so that the reflected and refracted rays<br>(A) 37   | urface. What should be the angle of incidence in<br>'s are perpendicular to each other?<br>(B) 47   |
|       | <ul> <li>Unpolarised light is incident on plane glass sur degrees, so that the reflected and refracted rays</li> <li>(A) 37</li> <li>(C) 57</li> </ul>  | urface. What should be the angle of incidence in<br>rs are perpendicular to each other?<br>(B) 47<br>(D) 67   |
| 185.  | <ul> <li>(C) 2 min</li> <li>Unpolarised light is incident on plane glass sur degrees, so that the reflected and refracted rays</li> <li>(A) 37</li> <li>(C) 57</li> <li>Determine the de-Broglie wavelength associate</li> </ul>  | urface. What should be the angle of incidence in<br>rs are perpendicular to each other?<br>(B) 47<br>(D) 67<br>ted with an electron, accelerated through a potential                              |
| 185.  | <ul> <li>Unpolarised light is incident on plane glass surdegrees, so that the reflected and refracted rays</li> <li>(A) 37</li> <li>(C) 57</li> <li>Determine the de-Broglie wavelength associated difference of 100 V.</li> </ul>  | urface. What should be the angle of incidence in<br>'s are perpendicular to each other?<br>(B) 47<br>(D) 67<br>ted with an electron, accelerated through a potential                              |
| 185.  | <ul> <li>(C) 2 min</li> <li>Unpolarised light is incident on plane glass surdegrees, so that the reflected and refracted rays</li> <li>(A) 37</li> <li>(C) 57</li> <li>Determine the de-Broglie wavelength associated difference of 100 V.</li> <li>(A) 1.227A°</li> </ul>                      | urface. What should be the angle of incidence in<br>rs are perpendicular to each other?<br>(B) 47<br>(D) 67<br>ted with an electron, accelerated through a potential<br>(B) 12.27A°               |
| 185.  | <ul> <li>(C) 2 min</li> <li>Unpolarised light is incident on plane glass surdegrees, so that the reflected and refracted rays</li> <li>(A) 37</li> <li>(C) 57</li> <li>Determine the de-Broglie wavelength associated difference of 100 V.</li> <li>(A) 1.227A°</li> <li>(C) 122.7A°</li> </ul> | urface. What should be the angle of incidence in<br>rs are perpendicular to each other?<br>(B) 47<br>(D) 67<br>ted with an electron, accelerated through a potential<br>(B) 12.27A°<br>(D) 1227A° |



193. Net capacitance of 3 identical capacitor in series is 1  $\mu$ *F*. What is the net capacitance in  $\mu$ *F* if connected in parallel?

(A) 3 (B) 6 (C) 9 (D) 12

194. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

(A) 2s (B) 1s (C) 0.5s (D) 0.25s

195. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

196.

Find current in the following circuit



- 197. Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find B at the midpoint of the axis between them if same current I flows through both loops.
  - (A)  $\hat{\mu}_0 I/2^{3/2} r$

(B)  $\mu_0 2 I/2^{3/2} r$ 

2Ω

(C)  $\mu_0 I/4\pi r$ 

- (D)  $\mu_{02} \nu_{2} \nu_{1}$ (D) Cannot be determined
- 198. A block of mass 4 kg is kept on a rough horizontal surface. The coefficient of static friction is 0.8. If a force of 19 N is applied on the block parallel to the floor, then the force of friction between the block and floor is:

| (A) | 19N | (B) | 18 N |
|-----|-----|-----|------|
| (C) | 16N | (D) | 9.8N |

199. Current in a circuit falls steadily from 2A to 0A in 10 ms. Calculate L if emf induced is 200V.

- (A) 1H (B) 2H (C) 3H (D) 4H
- 200. Self inductance of the air core inductor increases from 0.01 mH to 10 mH on introducing an iron core. What is the relative permeability of the core used?
  - (A)500(B)800(C)900(D)1000
| Sr. | Question |
|-----|----------|
| No. |          |

1. While walking on smooth surface one should take small steps to ensure Large friction Small friction (A) (B) (C) Larger normal force Smaller normal force (D) 2. What happens to a vehicle travelling in an unbanked curved path if the friction between the road and tires suddenly disappears Moves along tangent (A) (B) Moves radially in Moves radially out Moves along the curve (C) (D) A ball of mass 0.2 kg strikes an obstacle and moves at  $60^{\circ}$  to its initial direction. If its speed 3. changes from 20m/s to 10m/s the magnitude of impulse received by the ball is -----Ns (A) (B)  $2\sqrt{3}$  $2\sqrt{7}$ (C)  $2\sqrt{5}$ (D)  $3\sqrt{2}$ A spacecraft of mass 2000kg moving with 600 m/s suddenly explodes into two pieces. One piece 4. of mass 500 kg is stationary. The velocity of other part in m/s is (A) 600 (B) 800 1500 1000 (C) (D) 5. 16 kg 140 N 8 kg 4 kg The force on 16 kg is....? 140N (A) (B) 120N (C) 100N (D) 80N A man of mass 40 kg is at rest between the walls. If co eff. of friction between man and wall is 6. 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



7.

| (A) | 7D/4 | (B) | 9D/4 |
|-----|------|-----|------|
| (C) | 5D/4 | (D) | 3D/4 |

| 8.  | Gravitational force between two bodies is F. The space around the mass is now filled with a liquid of specific gravity 3. The gravitational force will be |  |  |
|-----|---|--|--|
|     | (A) F/9<br>(C) F  | (B) 3F<br>(D) F/3  |  |
| 9.  | <ul><li>A man weighs 75 kg on the surface of earth. F</li><li>(A) infinity</li><li>(C) zero</li></ul>   | His weight on the geostationary satellite is<br>(B) 150kg<br>(D) 75/2 kg   |  |
| 10. | g at a depth of 1600 km inside the earth in m/<br>(A) 6.65<br>(C) 8.65  | /s/s is<br>(B) 7.35<br>(D) 4.35  |  |
| 11. | A block of mass 19 M is suspended by a string<br>embedded in it. If the block completes the ver<br>(A) 140<br>(C) $20\sqrt{9.8}$                          | g of length 1m. A bullet of mass M hits it and gets<br>rtical circle the velocity of bullet in m/s is<br>(B) $20\sqrt{19.6}$<br>(D) 20       |  |
| 12. | A rubber ball falls from a height of 4m and relimpact is<br>(A) 20<br>(C) 23  | bounds to 1.5m. The % loss of energy during the<br>(B) 62.5<br>(D) 60  |  |
| 13. | <ul> <li>25 kg of sand is deposited each second on a correquired to maintain the belt in motion is</li> <li>(A) 2600W</li> <li>(C) 325W</li> </ul>        | <ul> <li>(B) 250W</li> <li>(D) 2500W</li> </ul>  |  |
| 14. | A uniform rod of mass M and length L standin<br>slipping at the bottom. The moment of inertia<br>(A) ML <sup>2</sup> /3<br>(C) ML <sup>2</sup> /9         | ng vertically on a horizontal floor falls without<br>will be<br>(B) ML <sup>2</sup> /6<br>(D) ML <sup>2</sup> /12                            |  |
| 15. | If the velocity of C.M of a rolling body is V, t<br>(A) $\sqrt{2}$ V<br>(C) 2V  | then velocity of highest point in the body will be<br>(B) V<br>(D) $V/\sqrt{2}$  |  |
| 16. | The angular momentum of two rotating bodies<br>of their rotational K.E is<br>(A) 1:2<br>(C) 1:4   | s are equal. If the ratio of their M.I is 1:4, the ratio<br>(B) 2:1<br>(D) 4:1   |  |
| 17. | The level of water in a tank is 5m. A hole 1 cr<br>/s is (take $g=10 \text{ m/s/s}$ )<br>(A) $10^{-3}$<br>(C) $10$  | m <sup>2</sup> is made at the bottom. The rate of leakage in m<br>(B) $10^{-4}$<br>(D) $10^{-2}$   |  |
| 18. | Two blocks A and B float in water. A floats w $3/5^{\text{th}}$ of its volume immersed. The ratio of thei (A) 5:12<br>(C) 3:20                            | vith 1/4 <sup>th</sup> of its volume immersed and B floats with<br>ir densities is<br>(B) 12:5<br>(D) 20:3                                   |  |
| 19. | The terminal velocity of a spherical ball of lea<br>liquid varies with R such that<br>(A) V/R is constant<br>(C) V is constant                            | <ul> <li>ad of radius R is V while falling through a viscous</li> <li>(B) VR is constant</li> <li>(D) V/R<sup>2</sup> is constant</li> </ul> |  |

| 20. | A hydraulic press uses a p<br>other piston that supports<br>(A) $100 \text{ cm}^2$<br>(C) $2 \times 10^4 \text{ cm}^2$ | piston of 100 cm <sup>2</sup> to exert a f<br>a mass of 2000 kg is (take g<br>(1)<br>(1) | force<br>g = 1<br>B)<br>D) | of $10^7$ dynes on water. The area of the 0m/s/s)<br>$10^9$ cm <sup>2</sup><br>$2 \times 10^{10}$ cm <sup>2</sup>                   |
|-----|--|--|----------------------------|---|
| 21. | When kerosene and cocor<br>through the same pipe, un<br>The volume of kerosene t<br>(A) 5.5 lit                        | nut oil of co eff. of viscosity<br>nder same pressure differenc<br>hat flows is          | v 0.00<br>ce an<br>B)      | <ul> <li>02 and 0.0154 Ns/m<sup>2</sup> are allowed</li> <li>d same time collects 1 lit of coconut oil.</li> <li>6.6 lit</li> </ul> |
|     | (C) 7.7 lit  |  | D)                         | 8.8 lit   |
| 22. | There is a circular hole in(A) increased(C) unchanged  | metal plate. When the plate  | e is h<br>B)<br>D)         | eated the radius of the hole becomes<br>decreased<br>depends on metal   |
| 23. | Specific heat of a substan   | ce depends on 1. Nature of s   | subs                       | tance. 2. Mass of substance. 3. Heat  |
|     | <ul><li>(A) Only 1 is correct</li><li>(C) All are correct</li></ul>  | ()<br>()   | B)<br>D)                   | Both 1 and 2 are correct<br>Only 1 and 3 are correct  |
| 24. | In a give process dW=0, c<br>(A) Temperature incre<br>(C) Pressure increases   | dq is <0 then for a gas<br>ases (1)  | B)<br>D)                   | Volume decreases<br>Pressure decreases  |
| 25. | <ul><li>The efficiency of carnot e</li><li>(A) Working substance</li><li>(C) Source temperature</li></ul>              | engine depends on<br>e (1<br>e (1  | B)<br>D)                   | Sink temperature<br>Both B and C  |
| 26. | A 200 turn coil of self ind with each turn of coil.  | luctance 30 mH carries a cu  | rrent                      | t of 5 mA. Find the magnetic flux linked  |
|     | (A) $7.5 \times 10^{-7}$ Wb<br>(C) $3 \times 10^{-7}$ Wb   | ()<br>(1   | B)<br>D)                   | 1.6 x 10 <sup>-7</sup> Wb<br>1.5 x 10 <sup>-7</sup> Wb  |
| 27. | The instantaneous value of time, the current will be n   | of current in an AC circuit is naximum?  | s I =                      | $2 \sin (100 \pi t + \pi/3)$ A. At what first   |
|     | (A) 1/100 s<br>(C) 1/500 s   |  | B)<br>D)                   | 1/200 s<br>1 s  |
| 28. | What in electric system re   | epresents force in mechanica   | al sy                      | stem ?  |
|     | (A) L $(C)$ $1/C$  |  | B)                         | Ι   |
| •   |  |  | D)                         | q<br>L  |
| 29. | A capacitor of 1 $\mu$ F is cha<br>(A) 30I   | arged with 0.01C of electric   | ity. F<br>B)               | 401 401   |
|     | (C) $50J$  |  | D)                         | 60J   |
| 30. | An electromagnetic wave<br>a medium having relative<br>(A) $3/\sqrt{2} \times 10^8$ m/s<br>(C) $2 \times 10^8$ m/s     | is travelling in vacuum with<br>electric and magnetic perm<br>()                         | h a s<br>leabi<br>B)       | peed of 3 x $10^8$ m/s. Find the velocity in<br>lity 2 and 1, respectively.<br>$1.5 \times 10^8$ m/s                                |
|     | $(C) 2 \times 10 \text{ III/S}$  | ()   | D)                         | ino change  |

31. Trace the path of a ray of light passing through a glass prism as shown in the figure. If the refractive index of glass is  $\sqrt{3}$ , find out the value of angle of emergence from prism.



- 39. The number of silicon atoms per m<sup>3</sup> is 5 x 10<sup>28</sup>. This is doped simultaneously with 5 x 10<sup>22</sup> atoms per m<sup>3</sup> of arsenic and 5 x 10<sup>20</sup> atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ .
  - (A)  $4.54 \times 10^{9} \text{m}^{-3}$ (B)  $4.95 \times 10^{22} \text{m}^{-3}$ (C)  $1.5 \times 10^{16} \text{m}^{-3}$ (D)  $5 \times 10^{28} \text{m}^{-3}$
- 40.Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre<br/>on the positive charge side along the axial line.<br/>(A)  $4.5 \ge 10^5 \text{N/C}$ <br/>(C)  $4.5 \ge 10^5 \text{N/C}$ <br/>(D)  $4.5 \ge 10^{-5} \text{NC}$
- 41. If the Gaussian surface is so chosen that there are some charges inside and some outside then the electric field is due to
  - (A) Only inside charges (B) Only outside charges
  - (C) All the charges (D) Cannot determine
- 42. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



43. Net capacitance of 3 identical capacitor in series is  $1\mu F$ . What is the net capacitance in  $\mu F$  if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

44. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

45. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

Find current in the following circuit 2Ω 1Ω 4Ω 5Ω 2Ω (A) 1A (B) 2A (C) 3A (D) 4A 47. Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find B at the midpoint of the axis between them if same current I flows through both loops.  $\mu_0 I/2^{3/2} r$ (B)  $\mu_0 2I/2^{3/2}r$ (A) (D) Cannot be determined  $\mu_0 I/4\pi r$ (C) 48. A block of mass 4 kg is kept on a rough horizontal surface. The coefficient of static friction is 0.8. If a force of 19 N is applied on the block parallel to the floor, then the force of friction between the block and floor is: 19N (A) **(B)** 18 N (C) 16N (D) 9.8N 49. Current in a circuit falls steadily from 2A to 0A in 10 ms. Calculate L if emf induced is 200V. (A) 1H(B) 2H 3H (D) 4H (C) 50. Self inductance of the air core inductor increases from 0.01 mH to 10 mH on introducing an iron core. What is the relative permeability of the core used? (A) 500 (B) 800 900 1000 (C) (D) 51. Among the following, the most stable complex is  $[Fe(H_2O)_6]^{3+}$ (B)  $[Fe(NH_3)_6]^{3+}$ (A)  $[Fe(C_2O_4)_3]^3$  $[Fe(Cl)_6]^3$ (C) (D) 52. Which is the correct coordination number (C.N) and oxidation number (O.N) of the transition metal atom in  $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ? C.N=3, O.N=+1 (A) (B) C.N=4, O.N=+2C.N=6, O.N=+1 (D) C.N=6, O.N=+3 (C) In a solid, oxide ions are arranged in ccp, cations A occupy one sixth of the tetrahedral voids and 53. cation B occupy one third of the octahedral voids. The formula of the solid is: (A) ABO<sub>3</sub>  $(B) A_3BO$ (C) AB<sub>3</sub>O (D)  $A_3B_3O_3$ 

46.

- 54. On mixing acetone to methanol some of the hydrogen bonds between methanol molecules break. Which of the following statements is correct about the above process?
  - At specific composition methanol acetone (A) mixture will form minimum boiling azeotrope and show positive deviation from Raoult's law
  - (C) At specific composition methanol acetone mixture will form minimum boiling azeotrope and show negative deviation from Raoult's law
- At specific composition methanol (B) acetone mixture will form maximum boiling azeotrope and show positive deviation from Raoult's law
- (D) At specific composition methanol acetone mixture will form maximum boiling azeotrope and show negative deviation from Raoult's law
- $K_{\rm H}$  value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10<sup>-5</sup> 55 and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is: formaldehyde< carbon dioxide
  - (A) formaldehyde<methane<carbon (B) dioxide<argon (C)
    - <methane<argon argon<carbon dioxide< argon <methane <carbon dioxide (D) methane<formaldehyde <formaldehyde
- The number of faradays of electricity required for electrolytic conversion of the mole of 56 nitrobenzene to aniline is:
  - 3F (A) (B) 4F (C) 6F (D) 5F

57. The positive value of the standard electrode potential of  $Ag^+/Ag$  indicates that:

- This redox couple is a stronger reducing This redox couple is a stronger (B) (A) agent than  $H^+/H_2$  couple oxidizing agent than  $H^+/H_2$  couple (C) Ag can displace H<sub>2</sub> from acid (D) Ag can displace  $H_2$  from base
- 58. Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The decrease in reaction rate is due to:
  - A decrease in surface area (A)
  - A decrease in the fraction of particles (C) possessing sufficient energy
- (B) A decrease in  $\triangle$  H for the reaction
- The introduction of an alternative (D) pathway with greater activation energy.
- 59. Which of the following statements is not correct?
  - The rate of a reaction decreases with (A) passage of time as concentration of reactants decrease
  - (C) For a zero order reaction the concentration of reactants remains changed with passage of time
- **(B)** The instantaneous rate a reaction is same at any time during the reaction
- (D) The rate of a reaction decreases with increase in concentration of reactant (s)
- 60. Which of the following gases shows the lowest adsorption per gram of charcoal? The critical temperatures are given in parenthesis:
  - (A) H<sub>2</sub> (33K) (B) CH<sub>4</sub>(190K)
  - (C) SO<sub>2</sub>(630K) (D)  $CO_2(304K)$

| 61. | <ul> <li>Freundlich adsorption isotherm is given by the exp statements are false?</li> <li>i. When 1/n=0, the adsorption is indepen ii. When n=0, the plot of x/m vs p graph iii. When 1/n=0, the adsorption is directly iv. When n=0, plot of x/m vs p is a curve (A) i and ii</li> </ul>                               | ression<br>dent o<br>is a lin<br>propo<br>(B) | n x/m=kp <sup>1/n</sup> . Which of the following<br>f pressure.<br>e parallel to x axis.<br>ritional to pressure.<br>ii and iy        |
|-----|--|---|---|
|     | (C) i and iii  | (D)   | all are false   |
| 62. | In the extraction of chlorine by electrolysis of an at<br>the following statements are true?<br>i. $\triangle G^0$ for the overall reaction is positive<br>ii. $\triangle G^0$ for the overall reaction is negative<br>iii. $E^0$ for the overall reaction is positive<br>iv. $E^0$ for the overall reaction is negative | queous<br>ve<br>ve                            | s solution of sodium chloride, which of   |
|     | <ul><li>(A) i and iv</li><li>(C) ii and iii</li></ul>  | (B)<br>(D)                                    | i and iii<br>iii and iv   |
| 63. | Which of the following pairs of ions are isoelectron<br>(A) $NO_2^+$ and $NO_3^-$<br>(C) $XeO_3^{2-}$ and $PCl_3$  | nic and<br>(B)<br>(D)                         | l isostructural ?<br>$CIO_3^-$ and $ICI_4^-$<br>$CIO_3^-$ and $SO_3^{2-}$   |
| 64. | <ul> <li>Which of the following hydrides is the strongest re</li> <li>(A) NH<sub>3</sub></li> <li>(C) AsH<sub>3</sub></li> </ul>   | ducing<br>(B)<br>(D)                          | g agent?<br>PH <sub>3</sub><br>SbH <sub>3</sub>   |
| 65. | Consider the reactions,<br>i. Zn + Conc. HNO <sub>3</sub> (hot) → Zn (N<br>ii. Zn + dil. HNO <sub>3</sub> (cold) → Zn (N<br>Compounds X and Y are, respectively<br>(A) N <sub>2</sub> O, NO  | $(O_3)_2 + (O_3)_2 - (B)$                     | $-X + H_2O$<br>+ Y + H_2O<br>NO <sub>2</sub> , NO <sub>2</sub>  |
|     | $(C) \qquad N_2, N_2O$   | (D)   | $NO_2$ , $NO$   |
| 66. | When KMnO <sub>4</sub> acts as an oxidizing agent in weakly manganese decreases by:  | ' alkali                                      | ine medium, the oxidation number of   |
|     | (A) 1<br>(C) 3   | (B)<br>(D)                                    | 2<br>5  |
| 67. | Acidified potassium dichromate solution turns gree<br>formation of:  | en whe  | en $Na_2SO_3$ is added to it due to the   |
|     | (A) $CrSO_4$<br>(C) $CrO_4^{2-}$   | (B)<br>(D)                                    | $\begin{array}{c} Cr_2(SO_4)_3\\ Cr_2(SO_3)_3 \end{array}$  |
| 68. | The d-electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ a<br>Which one of the following complexes will exhibit<br>numbers of Cr=24, Mn=25, Fe=26, Co=27)  | nd Co <sup>2</sup><br>minir                   | $^{2+}$ are d <sup>4</sup> , d <sup>5</sup> , d <sup>6</sup> and d <sup>7</sup> , respectively.<br>num paramagnetic behavior? (atomic |
|     | (A) $[Cr(H_2O)_6]^{2^+}$<br>(C) $[Fe(H_2O)_6]^{2^+}$   | (B)<br>(D)                                    | $[Mn(H_2O)_6]^{2+}$<br>$[Co(H_2O)_6]^{2+}$  |
| 69. | When 2-Bromopentane is heated with potassium et  | hoxid   | e in ethanol, the major product obtained  |
|     | <ul><li>(A) 2-Ethoxypentane</li><li>(C) Cis-Pent-2-ene</li></ul>   | (B)<br>(D)                                    | Pent-1-ene<br>Trans-Pent-2-ene  |

| 70. | Whick                         | h of the following undergoes nucleophilic s   | ubstituti               | on exclusively by S <sub>N</sub> <sup>1</sup> mechnism?              |
|-----|-------------------------------|---|-------------------------|--|
|     | (A)                           | Chloroethane  | (B)                     | Isopropyl chloride   |
|     | (C)                           | Chlorobenzene   | (D)                     | Benzyl chloride  |
| 71. | The n                         | umber of possible stereoisomers for CH <sub>3</sub> CH  | H=CHCH                  | H <sub>2</sub> CH(Br)CH <sub>3</sub> is:                             |
|     | (A)                           | 8   | (B)                     | 2  |
|     | (C)                           | 4   | (D)                     | 6  |
| 72. | 2-Met                         | thoxy-2-methylpropane on heating with HI  | produce                 | s:   |
|     | (A)                           | Methanol and sec-propyl iodide  | (B)                     | Methyl iodide and tert-butyl alcohol                                 |
|     | (C)                           | Methyl iodide and isobutene   | (D)                     | Methanol and tet-butyl iodide  |
| 73. | The le<br>(A)<br>(C)          | east acidic compound among the following<br>o-Nitrophenol<br>p-Nitrophenol  | is:<br>(B)<br>(D)       | m-Nitrophenol<br>Phenol  |
| 74. | An al<br>The k<br>(A)<br>(C)  | kene C <sub>7</sub> H <sub>14</sub> on reductive ozonolysis gives a<br>etone is:<br>2-Butanone<br>3-Pentanone   | n aldehy<br>(B)<br>(D)  | de with formula $C_3H_6O$ and a ketone.<br>2-Pentanone<br>Propanone  |
| 75. | The in<br>Aceto<br>(A)<br>(C) | ncreasing order of the rate of addition of H0<br>one iii) Acetophenone iv) benzophenone<br>i <ii <="" iii<="" iv<br="">iv<iii< i<="" ii<="" td=""><td>CN to the<br/>(B)<br/>(D)</td><td>e compounds i) Formaldehyde ii)<br/>iv&lt; ii&lt; iii &lt; i<br/>iv&lt; i&lt; ii&lt; iii</td></iii<></ii> | CN to the<br>(B)<br>(D) | e compounds i) Formaldehyde ii)<br>iv< ii< iii < i<br>iv< i< ii< iii |
| 76. | The c                         | arboxylic acid that does not undergo Hell-V   | /ohlard-/               | Zelinsky reaction is:  |
|     | (A)                           | CH <sub>3</sub> COOH  | (B)                     | (CH <sub>3</sub> ) <sub>2</sub> CHCOOH                               |
|     | (C)                           | CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH  | (D)                     | (CH <sub>3</sub> ) <sub>3</sub> CCOOH                                |
| 77. | C <sub>2</sub> H              | $I_5 NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y$  | $\xrightarrow{NH_3}$    | $\rightarrow$ Z.   |
|     | In the<br>(A)<br>(C)          | above sequence, Z is:<br>cyanoethane<br>methanamine   | (B)<br>(D)              | ethanamide<br>ethanamine   |
| 78. | The a                         | ttachment of which of the following group   | at para p               | osition in aniline will raise the $K_b$                              |
|     | (A)                           | −SO <sub>3</sub> H  | (B)                     | -OH  |
|     | (C)                           | −F  | (D)                     | -Br  |
| 79. | Whick                         | h of the following is an example of globula:  | r protein               | ?  |
|     | (A)                           | myosin  | (B)                     | collagen   |
|     | (C)                           | keratin   | (D)                     | haemoglobin  |
| 80. | Whick                         | h one of the following is synthesized in our  | body by                 | y sun rays?  |
|     | (A)                           | Vitamin D   | (B)                     | Vitamin B  |
|     | (C)                           | Vitamin K   | (D)                     | Vitamin A  |
| 81. | Capro                         | lactum is the is the starting material for the  | e synthes               | is of  |
|     | (A)                           | Nylon-6   | (B)                     | Nylon6,6   |
|     | (C)                           | Terylene  | (D)                     | Nylon 10   |
| 82. | The s                         | pecies which can serve as an initiator for ca   | tionic po               | olymerization is   |
|     | (A)                           | Lithium aluminium hydride   | (B)                     | Nitric acid  |
|     | (C)                           | Aluminium chloride  | (D)                     | BuLi   |

| 83. | Aspirin is an:<br>(A) analgesic<br>(C) antimalarial   | <ul><li>(B) antipyretic</li><li>(D) Both analgesic and antipyretic</li></ul>  |             |  |
|-----|---|---|-------------|--|
| 84. | The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:   |   |             |  |
|     | <ul><li>(A) Half of its atomic mass</li><li>(C) Same as atomic mass</li></ul>   | <ul><li>(B) One third of its atomic mass</li><li>(D) One fourth of its atomic mass</li></ul>  |             |  |
| 85. | Which of the following sets of quantum<br>(A) $n=4$ , $l=3$ , $m=4$ , $s=+1/2$<br>(C) $n=4$ , $l=3$ , $m=+1$ , $s=+1/2$   | numbers is correct for an electron in 4f subshell?<br>(B) $n=4$ , $l=3$ , $m=-4$ , $s=-1/2$<br>(D) $n=3$ , $l=2$ , $m=-2$ , $s=+1/2$  |             |  |
| 86. | The correct sequence of atomic radii is:<br>(A) Na>Mg>Al>Si<br>(C) Si>Al>Mg>Na  | <ul><li>(B) Al&gt;Si&gt;Na&gt;Mg</li><li>(D) Si&gt;Al&gt;Na&gt;Mg</li></ul>   |             |  |
| 87. | In which of the following, the bond ang<br>(A) NH <sub>3</sub><br>(C) PCl <sub>3</sub>  | e around the central atom is maximum?<br>(B) $NH_4^+$<br>(D) $SCl_2$  |             |  |
| 88. | Which of the following molecule does $(A)$ NF <sub>3</sub><br>(C) PF <sub>5</sub>   | tot exist<br>(B) $NF_5$<br>(D) $N_2H_4$   |             |  |
| 89. | <ul><li>If helium is allowed to expand in vacuu</li><li>(A) It is an inert gas</li><li>(C) Its critical temp. is low</li></ul>  | m, it liberates heat because<br>(B) It is an ideal gas<br>(D) It is a light gas   |             |  |
| 90. | i) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$<br>reactions,<br>(A) $x > y$<br>(C) $x = y$  | ii) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(g) + y$ KJ; For the given t<br>(B) $x < y$<br>(D) $x + y = 0$  | two         |  |
| 91. | If the bond dissociation energies of XY<br>respectively and $\Delta_{f}$ H of XY is -200KJm<br>(A) 400 KJmol <sup>-1</sup><br>(C) 200 KJmol <sup>-1</sup>   | (D) $X^{+}y^{-}0^{-1}$<br>X <sub>2</sub> , Y <sub>2</sub> (all diatomic molecules) are in the ratio 1:1:0.3<br>ol <sup>-1</sup> , the bond dissociation energy of X <sub>2</sub> will be:<br>(B) 300 KJmol <sup>-1</sup><br>(D) 100 KJmol <sup>-1</sup> | 5,          |  |
| 92. | <ul> <li>What will be the correct order of vapou<br/>among these compounds water has max</li> <li>(A) Water<ether<ethanol< li=""> <li>(C) Ether<ethanol<water< li=""> </ethanol<water<></li></ether<ethanol<></li></ul> | <ul> <li>pressure of water, ethanol and ether at 30<sup>o</sup>C? Given the imum boiling point and ether has minimum boiling point (B) Water<ethanol<ether< li=""> <li>(D) Ethanol<ether< li=""> </ether<></li></ethanol<ether<></li></ul>              | hat<br>int. |  |
| 93. | <ul> <li>Which of the following will occur if a Constant temperature?</li> <li>(A) [H<sup>+</sup>] will decrease to 0.001M</li> <li>(C) Percentage ionization will increase</li> </ul>                                  | .1M solution of a weak acid is diluted to 0.01M at<br>(B) pH will decrease<br>se (D) K <sub>a</sub> will increase   |             |  |
| 94. | Which of the following species involve<br>(A) $MnO_4^2 \rightarrow MnO_4^-$<br>(C) $MnO_4^- \rightarrow MnO_2$  | the transfer of $5N_A$ electrons per mole of it ?<br>(B) $MnO_4^- \rightarrow Mn^{2+}$<br>(D) $CrO_4^{2-} \rightarrow Cr^{3+}$  |             |  |
| 95. | 30-volume hyderogen peroxide means:<br>(A) $30\%$ H <sub>2</sub> O <sub>2</sub> by volume   | (B) $30g \text{ of } H_2O_2 \text{ solution containing } 1g$  | of          |  |
|     | (C) 1 cm <sup>3</sup> of solution liberates 30 cm gas at STP  | of $O_2$ (D) $30 \text{ cm}^3$ of the solution contains one   |             |  |

mole of H<sub>2</sub>O<sub>2</sub> 96. The correct sequence of covalent character is represented by: LiCl<NaCl<BeCl<sub>2</sub> BeCl<sub>2</sub><LiCl<NaCl (A) (B) NaCl<LiCl< BeCl<sub>2</sub> BeCl<sub>2</sub><NaCl<LiCl (C) (D) 97. Which of the following is known as pyrene? (A)  $CCl_4$ (B)  $CS_2$ S<sub>2</sub>Cl<sub>2</sub> Solid CO<sub>2</sub> (C) (D) 98. The most stable carbocation amongst the following is:  $(CH_3)_2CH^+$  $Ph_3C^+$ (A) (B) (C)  $CH_3CH_2^+$ (D)  $CH_2 = CH - CH_2^+$ 99. The molecule that will have dipole moment is: (B) cis-2-Butene (A) 2,2-Dimethylpropane (C) trans-2-Butene (D) 2,2,3,3-Tetramethylbutane 100. Of the five isomeric hexanes, the isomer which can give two monochlorinated compound is: 2-Methylpentane (B) 2,2-Dimethylbutane (A) (C) 2,3-Dimethylbutane (D) n-Hexane 101. If the letters of the word SACHIN are arranged in all possible ways and these words are written out as in dictionary, then the word SACHIN appears at serial number (A) 601 600 (B) 603 (C) (D) 602 102. The number of ways of distributing 8 identical balls in 3 distinct boxes so that none of the boxes remain empty is (A) 5 (B) 21 3<sup>8</sup> (D)  ${}^{8}C_{3}$ (C) 103. The number of arrangements of the letters of the word BANANA in which the two N's do not appear adjacently is 40 (A) (B) 60 (C) 80 (D) 100 104. Number of divisors of the form 4n+2 (n>0) of the integer 240 is (A) 4 (B) 8 10 (D) 3 (C) 105. 6 men and 4 women are to be seated in a row so that no two women sit together. The number of ways they can be seated is (A) 604800 **(B)** 17280 120960 (D) 518400 (C) If the cube roots of unity are 1, $\omega$ ,  $\omega^3$ , then the roots of the equation  $(x-1)^3 + 8 = 0$  are 106. (A)  $-1, -1 + 2 \omega, -1 - 2 \omega^2$ (B) -1, -1, -1  $-1.1-2 \oplus 1-2 \oplus^2$ (D)  $-1, 1+2 \, \omega, 1+2 \, \omega^2$ (C) If  $z_1$  and  $z_2$  are two non-zero complex numbers such that  $|z_1 + z_2| = |z_1| + |z_2|$ , then arg  $(z_1) - \arg(z_1) - \arg(z_2) = |z_1| + |z_2|$ . 107.  $(z_2)$  is equal to  $\frac{\pi}{2}$  $-\frac{\pi}{2}$ (A) **(B)** 1 (C) 0 (D)

| 108. | If arg<br>(A)<br>(C)         | (z) < 0, then arg (-z) – arg (z) =<br>$\pi$<br>$-\pi/2$  | (B)<br>(D)               | $-\pi$<br>$\pi/2$   |
|------|------------------------------|--|--------------------------|---|
| 109. | If $\omega$ is<br>(A)<br>(C) | an imaginary cube root of unity, then $(1+\infty-128 \ \infty)$<br>128 $\infty^2$                            | (B)<br>(D)               | $\begin{array}{c} \text{quals} \\ -128 \ \varpi \\ -128 \ \varpi^2 \end{array}$ |
| 110. | The peand on                 | oints z1, z2, z3, z4 in the complex plane are t<br>nly if  | he ver                   | tices of a parallelogram taken in order if                                      |
|      | (A)<br>(C)                   | z1 + z4 = z2 + z3<br>z1 + z2 = z3 + z4   | (B)<br>(D)               | $z_1 + z_3 = z_2 + z_4$<br>None of these  |
| 111. | Let R<br>12}. T<br>(A)       | = {(3,3) (6,6) (9,9) (12,12), (6,12) (3,9) (3,12<br>The relation is<br>Reflexive and transitive              | 2), (3,6<br>(B)          | 5)} be in a relation on the set A= {3, 6, 9,<br>Reflexive only                  |
|      | (C)                          | An equivalence relation  | (D)                      | Reflexive and symmetric only  |
| 112. | If a re $(a+y)$ ,            | al valued function $f(x)$ satisfies the functional where 'a' is a given constant and $f(0) = 1$ , th $-f(x)$ | l equa<br>en f (2<br>(B) | ation $f(x-y) = f(x) f(y) - f(a-x) f$<br>2a-x) is equal to<br>f(x)              |
|      | (C)                          | f(x) + f(a-x)  | (D)<br>(D)               | f(x)  |
| 113. | If the                       | graph of the function $f(x)$ is symmetrical abo  | out the                  | line $x=2$ , then   |
|      | (A)                          | f(x+2) = f(x-2)  | (B)                      | f(2+x) = f(2-x)   |
|      | (C)                          | f(x) = f(-x)   | (D)                      | f(x) = -f(-x)   |
| 114. | The fi                       | unction $f: R \to R$ defined by $f(x) = \sin x$ is   |                          |   |
|      | (A)                          | into   | (B)                      | onto  |
| 115  | (C)<br>In                    |  | (D)                      | many-one  |
| 115. | in a co<br>studer            | onege of 300 students, every student reads 5 in the number of newspapers is                                  | iewsp                    | apers and every newspaper is read by 60   |
|      | (A)                          | At least 30  | (B)                      | At most 20  |
|      | (C)                          | Exactly 25   | (D)                      | None of these   |
| 116. | The va                       | alue of a for which the sum of the squares of the least value is   | the roo                  | ots of the equation $x^2 - (a - 2) x - a - 1 = 0$                               |
|      | (A)                          | 1  | (B)                      | 0   |
|      | (C)                          | 3  | (D)                      | 2   |
| 117. | If the                       | roots of the equation $x^2 - bx + c = 0$ be two co   | onsecu                   | tive integers, then $b^2 - 4c$ equals   |
|      | (A)<br>(C)                   | -22  | (В)<br>(D)               | 5<br>1  |
| 118  | (-)<br>If (1-r               | ) is a root of quadratic equation $x^2 + px + (1 - p)$   | (-)                      | 0 then the roots are  |
| 110. | (A)                          | 0, 1   | (B)                      | - 1, 1  |
|      | (C)                          | 0, -1  | (D)                      | - 1, 2  |
| 119. | The n                        | umber of real solutions of the equation $x^2 - 3 x$  | x +2=                    | =0 is/are   |
|      | $(\mathbf{A})$               | 2  | (B)                      | 4   |
|      | (C)                          | 1  | (D)                      | 3   |
| 120. | $\int df x^2 + (A)$          | 2ax + 10 - 3a > 0 for every real value of x, t   | hen<br>(P)               | 0 < 5   |
|      | (A)<br>(C)                   | a < 5<br>-5 < a < 2  | (D)                      | a > -5<br>2 < a < 5   |
|      | (-)                          |  | (2)                      |   |

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| 121. | <ul> <li>The angle between two diagonals of a cube is</li> <li>(A) 45°</li> <li>(C) 90°</li> </ul>   | (B)<br>(D)            | $60^{\circ}$ tan <sup>-1</sup> 2 $\sqrt{2}$  |
|------|--|-----------------------|--|
| 122. | If the angle between two vectors $\vec{i} + \vec{k}$ and $\vec{i} - \vec{j} + \vec{k}$<br>(A) 2<br>(C) -2  | - ak<br>(B)<br>(D)    | is $\pi/3$ , then the value of a is<br>4<br>0  |
| 123. | The scalar $\vec{A} \cdot (\vec{B} + \vec{C}) \times (\vec{A} + \vec{B} + \vec{C})$ equals<br>(A) 0<br>(C) $[\vec{A} \ \vec{B} \vec{C}]$                 | (B)<br>(D)            | $\begin{bmatrix} \vec{A} \ \vec{B} \vec{C} \end{bmatrix} + \begin{bmatrix} \vec{B} \ \vec{C} \ \vec{A} \end{bmatrix}$<br>None of these |
| 124. | The points with position vectors $60\hat{i} + 3\hat{i}, 40\hat{i} - 8\hat{i}$<br>(A) $a=-40$<br>(C) $a=20$   | ĵ, aî -<br>(B)<br>(D) | <ul> <li>52ĵ are collinear if</li> <li>a=40</li> <li>None of these</li> </ul>  |
| 125. | <ul><li>The number of vectors of unit length perpendicular</li><li>(A) one</li><li>(C) three</li></ul>   | to ve<br>(B)<br>(D)   | ctors $\vec{a} = (0 \ 1, 1)$ and $\vec{b} = (1 \ 1, 0)$ is<br>two<br>infinite  |
| 126. | The angle between the lines $2x = 3y = -z$ and $6x = (A) = 0^{\circ}$<br>(C) $45^{\circ}$  | = - y =<br>(B)<br>(D) | -4z is<br>90°<br>30°   |
| 127. | Distance between two parallel planes $2x + y + 2z =$<br>(A) $3/2$<br>(C) $7/2$   | = 8 and<br>(B)<br>(D) | 4 4x + 2y + 4z + 5 = 0 is<br>5/2<br>9/2  |
| 128. | <ul><li>The method of least squares dictates that we choose of deviations of the points from the line is:</li><li>(A) Maximum</li><li>(C) Zero</li></ul> | e regro<br>(B)<br>(D) | ession line where the sum of the square<br>Minimum<br>Positive   |
| 129. | <ul><li>If the value of any regression coefficient is zero, th</li><li>(A) Qualitative</li><li>(C) Dependent</li></ul>                                   | en two<br>(B)<br>(D)  | o variables are:<br>Correlated<br>Independent  |
| 130. | <ul><li>A process by which we estimate the value of dependent variables is called:</li><li>(A) Correlation</li><li>(C) Residual</li></ul>                | (B)<br>(D)            | variable on the basis of one or more<br>Regression<br>Slope  |
| 131. | If $A = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$ , then $A^3 =$<br>(A) A<br>(C) 3A   | (B)<br>(D)            | 2A<br>4A   |
| 132. | The value of $\begin{vmatrix} 1+x & 1 & 1\\ 1 & 1+y & 1\\ 1 & 1 & 1+z \end{vmatrix}$ is equal to   | ~                     |  |
| 133. | (A) $1+x+y+z$<br>(C) $xyz$<br>If $A^2 - A + I = 0$ , then the inverse of A is  | (B)<br>(D)            | x+y+z<br>xyz+xy+xz+yz  |
|      | (A) A<br>(C) I–A   | (B)<br>(D)            | A–I<br>I   |
|      |  |                       |  |

| 134. | The nu<br>(A)<br>(C) | umber of bijec<br>106<br>106 !       | ctive function                  | is from a set A to i                        | itself w<br>(B)<br>(D)   | when A contains 106 elements is $106^{3}$ $2^{106}$ |
|------|----------------------|--------------------------------------|---------------------------------|---|--------------------------|---|
| 135. | The va               | alue of 12                           | 12 13<br>13 14<br>14 15         | is  |                          |   |
|      | (A)<br>(C)           | 1<br>-1                              | 11 101                          |   | (B)<br>(D)               | 0<br>67   |
| 136. | The m                | nean deviation                       | of the data 3                   | , 10, 10, 4, 7, 10,                         | 5 from                   | the mean is   |
|      | $(\mathbf{A})$       | 2                                    |                                 |   | (B)                      | 2.57  |
|      | (C)                  | 3                                    |                                 |   | (D)                      | 3.75  |
| 137. | The st               | andard deviati                       | ion of the dat                  | a 6, 5, 9, 13, 12, 8                        | 8, 10 is                 |   |
|      | (A)                  | E2                                   |                                 | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,     | (B)                      | 52  |
|      |                      | $\frac{32}{7}$                       |                                 |   |                          | 7   |
|      | $(\mathbf{C})$       |                                      |                                 |   | (D)                      | 6   |
|      | (C)                  | V6                                   |                                 |   | (D)                      | 0   |
| 138. | Let a, of the        | b, c, d, e be th<br>observations a   | ne observation<br>a+k, b+k, c+l | ns with mean m an<br>k, d+k, e+k is         | nd stan                  | dard deviation s. The standard deviation            |
|      | (A)                  | ks                                   |                                 |   | (B)                      | S   |
|      | (C)                  | S+K                                  |                                 |   | (D)                      | S/K   |
| 139. | Coeffi<br>25, res    | icients of varia<br>spectively. Dif  | ation of two of fference of th  | distributions are 50<br>heir standard devia | ) and 6<br>tions i       | 60, and their arithmetic means are 30 and s         |
|      | (A)                  | 2.5                                  |                                 |   | (B)                      | 1   |
|      | (C)                  | 1.5                                  |                                 |   | (D)                      | 0   |
| 140. | Consi<br>numbe       | der the first 10<br>er, the variance | ) positive inte<br>e of the num | egers. If we multip<br>bers so obtained is  | oly eac                  | h number by -1 and then add 1 to each               |
|      | (A)                  | 8.25                                 |                                 |   | (B)                      | 6.50  |
|      | (C)                  | 3.87                                 |                                 |   | (D)                      | 2.87  |
| 141. | For a                | linear program                       | nming equation                  | ons, convex set of                          | equati                   | ions is included in the region of                   |
|      | (A)                  | Feasible solu                        | itions                          |   | (B)                      | Disposed solutions                                  |
|      | (C)                  | Profit solutio                       | ons                             |   | (D)                      | Loss solutions                                      |
| 142. | Infeas               | ibility means t                      | that the numb                   | per of solutions to                         | the lin                  | ear programming models that satisfies               |
|      | (A)                  | at least 1                           |                                 |   | (B)                      | 0   |
|      | (C)                  | An infinite n                        | umber                           |   | (D)                      | At least 2  |
|      |                      |                                      |                                 |   |                          |   |
| 143. | A con                | straint that do                      | es not affect                   | the feasible regior                         | $\frac{1}{(\mathbf{P})}$ | Padundant constraint                                |
|      | (A)                  | Standard con                         | ny constraint                   |   | (D)<br>(D)               | Slack constraint                                    |
|      |                      |                                      |                                 |   |                          |   |

| 144. | Consider the following LPP. Maximize $3x_1 + 8x_2$ subject to $2x_1 + 5x_2 \le 10$ , $6x_1 + x_2 \le 6$ , $x_1, x_2 \ge 0$ . The optimal value of the function is |  |         |  |  |
|------|---|--|---------|--|--|
|      | (A) $0$   | (B) 3  |         |  |  |
|      | (C) $\frac{111}{7}$   | (D) 16   |         |  |  |
|      | /   |  |         |  |  |
| 145. | For linear inequalities, solution set for a group $(A)$   | of inequalities is classified as   |         |  |  |
|      | (A) Concave set<br>(C) Loss set   | (B) Convex set<br>(D) Profit set   |         |  |  |
|      |   |  |         |  |  |
| 146. | Which of the following is unary operations?   | (B) Multiplication   |         |  |  |
|      | (C) Square root   | (D) None of these  |         |  |  |
| –    |   |  |         |  |  |
| 147. | If * is a binary operation in A then<br>(A) A is closed under *   | (B) A is not closed under *  |         |  |  |
|      | (C) A is not closed under +   | (D) A is closed under –  |         |  |  |
| 1.40 |   |  |         |  |  |
| 148. | (A) $Log_{10} 10 = 1$   | (B) $\log(2+3) = \log(2 \times 3)$   |         |  |  |
|      | (C) $Log_{10} 1 = 0$  | (D) $\log(1+2+3) = \log 1 + \log 2 + \log 1$   | og 3    |  |  |
| 149  | If $\log (a/b) + \log (b/a) = \log (a+b)$ then  |  |         |  |  |
| 119. | (A) $a+b=1$   | (B) $a-b=1$  |         |  |  |
|      | (C) a=b   | (D) $a^2 - b^2 = 1$  |         |  |  |
| 150. | The value of e is   |  |         |  |  |
|      | (A)  0  | (B) 1<br>(D) 214   |         |  |  |
|      | (C) 2./18   | (D) 2.14   |         |  |  |
| 151. | $1 + \sin x + \sin^2 x + \dots$ up to $\infty = 4 + 2\sqrt{3}, 0 < x < 1$   | $\leq \Pi$ and $x \neq \frac{\pi}{2}$ then x =   |         |  |  |
|      | (A) $\frac{\pi}{6}, \frac{\pi}{2}$  | (B) $\frac{\pi^2}{2}, 5\frac{\pi}{6}$  |         |  |  |
|      | (C) $2\frac{\pi}{3}, \frac{\pi}{6}$   | (D) $\frac{3}{2}, 2\frac{9}{3}$  |         |  |  |
|      | 3 0   | 5 5  |         |  |  |
| 152. | A cow is tied to a post by a rope. The cow move   | is along the circular path always keeping the out $72^{\circ}$ at the centre, the length of the ro | he rope |  |  |
|      | (A) 35 meters   | (B) 22 meters  | pc is   |  |  |
|      | (C) 56 meters   | (D) 45 meters  |         |  |  |
| 153. | $\int_{x}^{x}$  |  |         |  |  |
|      | If $f(x) = \int_{-1}  t  dt$ , for any $x \ge 0$ , $f(x) =$   |  |         |  |  |
|      | (A) $\frac{1}{2}(1-x^2)$  | (B) $1 - x^2$  |         |  |  |
|      | (C) $\frac{1}{2}(1+r^2)$  | (D) $1 + x^2$  |         |  |  |
|      | 2 (1 1 % )  |  |         |  |  |

| 154. | The to $(A)$                 | otal of number of terms in the expansion of (x   | $(B)^{10}$       | $x^{00} + (x-y)^{100}$ after simplification is         |
|------|------------------------------|--|------------------|--|
|      | $(\mathbf{R})$               | 202  | (D)<br>(D)       | 100  |
| 155. | The r                        | naximum value of $\frac{\log x}{2}$ in (2, $\infty$ ) is   |                  |  |
|      | (A)                          | x<br>1   | (B)              | 2  |
|      | (C)                          | e  | (D)              | e<br>1   |
|      |                              |  |                  | е  |
| 156. | The s                        | series $\frac{1}{2} + \frac{1}{5} + \frac{1}{2} + \frac{1}{2} + \dots \dots up$ to $n t$   | erms             | is equal to  |
|      | (A)                          | $n^{2\cdot 5}$ 5·8 8·11  | (B)              | 1  |
|      |                              | $\overline{4n+6}$  |                  | $\overline{6n+4}$                                      |
|      | (C)                          | $\frac{h}{6n+4}$   | (D)              | $\frac{n}{3n+7}$                                       |
| 157  | t,                           | 0n + 1   |                  | 511 + 7  |
| 137. | $\lim_{x \to 1} \frac{u}{x}$ | $\frac{\operatorname{an}(x-1)}{x-1}$ equals  |                  |  |
|      | (A)                          | $\frac{x-1}{2}$  | (B)              | 1  |
|      | $(\mathbf{C})$               | 2  | <b>(D)</b>       | $\overline{2}_{1}$                                     |
|      | (C)                          | -2   | (D)              | $-\frac{1}{2}$   |
| 158  |                              | dy   |                  | 2  |
| 130. | If $x^n$                     | $^{n}y^{n} = (x + y)^{m+n}$ then $\frac{dy}{dx}$ is equal to   |                  |  |
|      | (A)                          | $\frac{x+y}{y}$  | (B)              | xy   |
|      | $(\mathbf{C})$               | xy   | (D)              | v  |
|      | (C)                          | 0  | (D)              | $\frac{x}{x}$  |
| 159. | Ifai                         | $-sin^{-1}(t^2-1)$ and $y - sec^{-1}(\frac{1}{t^2-1})$ then $\frac{dy}{dx}$  | is equa          | l to   |
|      | (A)                          | $x = e^{-x} + e^{-x}$ | (B)              | У  |
|      | ()                           | $\overline{y}$   | (-)              | $-\frac{1}{x}$   |
|      | (C)                          | $\frac{y}{z}$  | (D)              | $-\frac{x}{x}$   |
| 1.60 |                              | X  | . 2              | <i>y</i>   |
| 160. | Find                         | the sum of $1^{st}$ n terms of the series $\frac{1^2}{1}$  | $+\frac{1^2}{1}$ | $\frac{+2^2}{-2} + \frac{1^2 + 2^2 + 3^2}{-1} + \dots$ |
|      | (A)                          | n + 2 1  | 1 -<br>(B)       | +2 1+2+3<br>n(n+2)                                     |
|      |                              | 3  |                  |  |
|      | (C)                          | $\frac{n(n-2)}{2}$   | (D)              | n(n-2)   |
|      |                              | 3 π  |                  | 6  |
| 161. | The 1                        | value of $\tan \frac{\pi}{8}$ is equal to  |                  |  |
|      | (A)                          | 1  | (B)              | $\sqrt{2} + 1$   |
|      | $(\mathbf{C})$               | 2 1  | (D)              | 1 1  |
|      |                              | $\frac{1}{\sqrt{2}+1}$   | (D)              | $1 - \sqrt{2}$   |
|      |                              | γ <u>μ</u> ι Ι   |                  |  |

| 162. | The s                                   | volution for the differential equation $\frac{dy}{dy}$  | $\frac{dx}{dx} + \frac{dx}{dx}$ | c = 0 is  |
|------|---|---|---------------------------------|---|
|      | (A)                                     | $\frac{1}{n} + \frac{1}{r} = c$   | (B)                             | $\log x \cdot \log y = c$   |
|      | (C)                                     | y x x xy = c  | (D)                             | x + y = c   |
| 163. | If PA                                   | $A = \frac{1}{2}, PB = \frac{1}{4}, P(A \cup B) = \frac{5}{12}, then P(A \cup B) = \frac{5}{12}$  | / B)                            | =   |
|      | (A)                                     | 25 4 12   | (B)                             | 5   |
|      | (C)                                     | $\frac{16}{16}$   | (D)                             | $\frac{4}{2}$   |
| 164. | If (a                                   | $(-2)x^2 + 9y^2 = 4$ represents rectangula  | r hyp                           | erbola then a equals  |
|      | (A)<br>(C)                              | 0<br>9  | (B)<br>(D)                      | 2<br>None of these  |
| 165. | If $\sum$                               | $n = 55$ , then the value of $\sum n^2$ is equal  | ıl to                           |   |
|      | (A)                                     | 385   | (B)                             | 506   |
| 166  | (C)                                     | 1115  | (D)                             | 3025  |
| 100. | The 1                                   | $1^{th}$ term in expansion of $\left(x + \frac{1}{\sqrt{x}}\right)^{-1}$ is   |                                 |   |
|      | (A)                                     | 999   | (B)                             | 1001  |
|      | (C)                                     | <i>x</i><br>1   | (D)                             | $\frac{\frac{\chi}{\chi}}{1001}$  |
| 167. | $\int_{0}^{\frac{\pi}{2}} \frac{1}{si}$ | $\frac{\sin^{1000}x  dx}{n^{1000}x + \cos^{1000}x}$ is equal to   |                                 |   |
|      | (A)                                     | $\frac{1000}{\pi}$  | (B)                             | $\frac{1}{\pi}$   |
|      | (C)                                     | $\frac{1}{2}$   | (D)                             | $\frac{\pi}{4}$   |
| 168. | $f e^x$ :<br>(A)                        | $x^{5} dx$ is<br>$e^{x}[x^{5} + 5x^{4} + 20x^{3} + 60x^{2} + 120x + 120] + C$<br>$e^{x}[x^{5} - 5x^{4} + 20x^{3} - 60x^{2} + 120x - 120] + C$ | (B)<br>(D)                      | $e^{x}[x^{5} - 5x^{4} - 20x^{3} - 60x^{2} - 120x - 120] + C$ $e^{x}[x^{5} + 5x^{4} + 20x^{3} - 60x^{2} - 120x + 120] + C$ |
| 169. | (0)                                     | $\sec x$ dr is aqual to   | (D)                             |   |
|      | $\int \frac{1}{\sec(A)}$                | $\frac{1}{x} + \tan x$  | (B)                             | $\log(1 + \sec x) + C$  |
|      | $(\mathbf{C})$                          | $\sec x + \tan x + C.$  | (D)                             | $\log \sin x + \log \cos x + C.$  |
| 170. | If $f(x)$                               | $x) + be^{ax} + ae^{bx}$ , then $f''(0) =$  | <b>(D</b> )                     | ).h   |
|      | (A)<br>(C)                              | ab(a+b)   | (B)<br>(D)                      | ab  |
| 171. | The l                                   | ength of the latus rectum of the parabo   | $la 4y^2$                       | $x^{2} + 3x + 3y + 1 = 0$ is  |
|      | (A)                                     | $\frac{4}{3}$   | (B)                             | /   |
|      | (C)                                     | 12  | (D)                             | $\frac{3}{4}$   |
|      |   |   |                                 | т   |

| 172. | The p          | principal value of $\sin^{-1} \tan\left(-\frac{5\pi}{4}\right)$ is                          |                    |  |
|------|----------------|---|--------------------|--|
|      | (A)            | <u>π</u>  | (B)                | <u></u>  |
|      | $(\mathbf{C})$ | $\frac{4}{\pi}$   | (D)                | $\frac{4}{\pi}$  |
|      | (0)            | $\overline{2}$  | (D)                | $-\frac{1}{2}$   |
| 173. | If y =         | $= e^{m \sin^{-1}x}$ , then $\frac{d^2y}{dx^2}$ at $x = 0$ is                               |                    |  |
|      | (A)            | $dx^2$  | (B)                | $m^2$  |
|      | (C)            | $-m^{2}$  | (D)                | 2m   |
| 174. | If y =         | $= \sin(2 \sin^{-1}x)$ , then it satisfies the diff   | erent              | ial equation   |
|      | (A)            | $(1 - x^2)y_2 - xy_1 + 4y = 0.$   | (B)                | $(1+x^2)y_2 - xy_1 + 4y = 0.$  |
|      | (C)            | $(1 - x^2)y_2 - xy_1 + y = 0.$  | (D)                | $(1+x^2)y_2 - xy_1 + 4y = 0.$  |
| 175. | The v          | value of $\cos \left[ 2 \tan^{-1} \frac{1+x}{1-x} + \sin^{-1} \frac{1-x^2}{1+x^2} \right]$  | is                 |  |
|      | (A)            | $\sqrt{2}$  | (B)                | 1  |
|      | (C)            | 0   | (D)                | -1   |
| 176. | The e          | quation of the circle which touches the x-axis  | and v              | whose centre is (1,2), is  |
|      | (A)            | $x^2 + y^2 - 2x + 4y + 1 = 0.$  | (B)                | $x^2 + y^2 - 2x - 4y + 1 = 0.$   |
|      | (C)            | $x^2 + y^2 + 2x + 4y + 1 = 0.$  | (D)                | $x^2 + y^2 + 4x + 2y + 1 = 0.$   |
| 177. | The a          | lifferential equation $y \frac{dy}{dx} + x = c$ repres                                      | sents              |  |
|      | (A)            | A family of hyperbolas  | (B)                | A family of circles whose centres are on the y-axis.                           |
|      | (C)            | A family of parabolas   | (D)                | A family of circles whose centres are on the x-axis.                           |
| 178. | A stor         | ne is thrown vertically upwards and the heigh $+ 80t - 16t^2$ The stone reaches the maximum | t x ft r<br>height | eached by the stone in t seconds is given                                      |
|      | (A)            | 2s  | (B)                | 2.5s   |
|      | (C)            | 3s  | (D)                | 1.5s   |
| 179. | The a          | area of the region bounded by $y = 2x - x$  | с² and             | l the x - axis is  |
|      | (A)            | 8<br>— sg.units   | (B)                | 4<br>— sq.units  |
|      | (C)            | 3<br>7  | (D)                | 2  |
|      | (0)            | $\frac{1}{3}$ sq. units   | (D)                | $\frac{1}{3}$ sq. units  |
| 180. | If f (         | $f(x) = \begin{cases} 2a - x, & -a < x < a \\ 3x - 2a, & a < x \end{cases} $ then which     | h of th            | e following is true  |
|      | (A)<br>(C)     | f(x) is discontinuous at $x = a$ .<br>$f(x)$ is differentiable at $x \ge a$ .               | (B)<br>(D)         | f(x) is not differentiable at $x = a$ .<br>f(x) is continuous at all $x < a$ . |
| 181. | A die          | is tossed thrice. If getting an even number is  | consid             | lered as success, the variance of the  |
|      | $(\Delta)$     | bility distribution is  | $(\mathbf{R})$     | 1  |
|      | (11)           | $\frac{2}{4}$   | (D)                | $\frac{1}{2}$  |
|      | (C)            | $\underline{\hat{1}}$   | (D)                | 2  |
|      |                | 4   |                    | 3  |

| 182. | The co<br>(A)                    | pordinates of the foot of the perpendicular drawn f $(9 \ 17)$                                 | rom th<br>(B)       | e point (3,4) on the line $2x + y - 7 = 0$ is<br>(1, 5)            |
|------|----------------------------------|--|---------------------|--|
|      | (C)                              | $\left(\overline{5}, \overline{5}\right)$<br>(-5, 1)   | (D)                 | (1, -5)  |
| 183  | The p                            | oint $(5 -7)$ lies outside the circle  |                     |  |
| 1001 | (A)                              | $x^2 + y^2 - 8x = 0$   | (B)                 | $x^2 + y^2 - 5x + 7y = 0$  |
|      | (C)                              | $x^2 + y^2 - 5x + 7y - 1 = 0$  | (D)                 | $x^2 + y^2 - 8x + 7y - 2 = 0$                                      |
| 184. | If tan                           | $15^{\circ} = 2 - \sqrt{3}$ , then 2 tan $1095^{\circ} + \cot 975^{\circ} + \tan 1095^{\circ}$ | n (–19              | 95°) =   |
|      | (A)                              | $2 + \sqrt{3}$   | ( <b>B</b> )        | $4 + 2\sqrt{3}$  |
|      | (C)                              | $4 - 2\sqrt{3}$  | (D)                 | $2 - \sqrt{3}$   |
| 185. | The n                            | umber of circles touching the lines $x = 0, y =$   | a and               | $\mathbf{y} = \mathbf{b}$ is                                       |
|      | (A)                              | One  | (B)                 | Two  |
|      | (C)                              | Four   | (D)                 | Infinite   |
| 186. |                                  |  |                     | $dv \sqrt{5} \frac{1}{3} d^2 v$                                    |
|      | The o                            | rder and degree of the differential equation   | $1 + (\frac{3}{2})$ | $\left[\frac{dy}{dx^2}\right] = \frac{dy}{dx^2}$ are respectively, |
|      | (A)                              | 1,5  | (B)                 | 2, 1   |
|      | (C)                              | 2, 5   | (D)                 | 2, 3   |
| 187. | $x^{2n} - y$                     | y <sup>2n</sup> is divisible by  | <b>(D)</b>          |  |
|      | (A)                              | x - y<br>x + y   | (D)                 | y – x<br>None of these   |
| 100  | (C)<br>Mr V                      | 1 + y  | (E)                 | $i_{a}$ V has an $200/$ shares if Mr. V also                       |
| 100. | attend                           | Is Otherwise she has a 50% chance of attendi   | ng If               | I go to the meet and see Miss Y there                              |
|      | then t                           | he probability that Mr. X is also there, is  |                     |  |
|      | (A)                              | 24   | (B)                 | 25   |
|      | $(\mathbf{C})$                   | 29<br>26   | $(\mathbf{D})$      | 29<br>27   |
|      | (C)                              | $\frac{20}{29}$  | (D)                 | $\frac{27}{29}$  |
| 189  | c <sup>3</sup>                   |  |                     | 25   |
| 107. |                                  | $\frac{\sqrt{4-x}}{\sqrt{4-x}}dx$  |                     |  |
|      | $J_1 \sqrt{2}$ (A)               | $x + \sqrt{4} - x$   | (B)                 | 1  |
|      | (C)                              | 3  | (D)                 | 2  |
| 190. | a                                | $\sin x - 1$   |                     |  |
|      | $\lim_{x \to 0} \frac{\pi}{h^2}$ | $\frac{1}{\sin x - 1}$   |                     |  |
|      | (A)                              | $\log a$   | (B)                 | $\log\left(\frac{a}{a}\right)$                                     |
|      |                                  | $\log b$   |                     | (b)  |
|      | (C)                              | 1  | (D)                 | 0  |
| 191. | The v                            | alue of $\frac{C_1}{2} + \frac{C_3}{4} + \frac{C_5}{6} + \dots \dots$ where $C_1, C_3, C_5$    | a                   | re the binomial coefficients of order n,                           |
|      | 1S<br>(A)                        | $2^{n+1} - 1$  | (B)                 | $2^n - 1$  |
|      | (C)                              | $\frac{n+1}{2^{n+1}}$  | (D)                 | $n+1 \\ 2^{n+1}+1$   |
|      |                                  | $\overline{n+1}$   |                     | $\overline{n+1}$   |

| 192. | The v             | alue of $\binom{n}{r}$ + 2. $\binom{n}{r-1}$ + $\binom{n}{r-2}$ , where | $\binom{n}{k}$ d | lenotes the binomial coefficient of order              |
|------|-------------------|---|------------------|--|
|      | n, is<br>(A)      | $\binom{n}{2}$  | (B)              | $\binom{n+1}{2}$                                       |
|      | (C)               | $\binom{n+2}{n}$  | (D)              | ( r )<br>None of these                                 |
| 193. | Which             | r one of the following is possible?                                     |                  |  |
|      | (A)               | $\cos\theta = \frac{7}{3}$  | (B)              | $\sin\theta = \frac{a^2 + b^2}{a^2 - b^2}, (a \neq b)$ |
|      | (C)               | $\sec\theta = \frac{4}{5}$  | (D)              | $\tan \theta = 45$                                     |
| 194. | In the            | expansion of $\left(x^2 - \frac{1}{3x}\right)^9$ the term indep         | enden            | t of x is  |
|      | (A)               | T <sub>7</sub>  | (B)              | $T_6$  |
|      | (C)               | $T_8$   | (D)              | Τ <sub>9</sub>   |
| 195. | <i>If x</i> =     | $=e^{y+e^{y+\cdots\infty}}, x>0, then \frac{dy}{dx}$ is                 |                  |  |
|      | (A)               | <u>x</u>  | (B)              | 1  |
|      | $(\mathbf{C})$    | 1 + x   |                  | $\frac{1}{x}$  |
|      | (C)               | $\frac{1-x}{x}$   | (D)              | $\frac{1+x}{x}$  |
| 107  | C                 | X   |                  | x  |
| 196. | $e^{x}$           | $\left(\frac{1+\sin x}{1+\sin x}\right) dx$ is                          |                  |  |
|      | J<br>(A)          | $\tan\left(\frac{x}{2}\right) + C$                                      | (B)              | $e^x \sin x + C$                                       |
|      | (C)               | $e^x \tan\left(\frac{x}{2}\right) + C$                                  | (D)              | $e^x + C$  |
| 197. | The fi            | unction $f(x) = [x]$ , where [x] denotes greatest                       | intege           | r function is continuous at                            |
|      | (A)               | -2  | (B)              | 1.5  |
|      | (C)               | 4   | (D)              | 1  |
| 198. | If the            | arithmetic mean of two positive numbers a an                            | d b (a           | >b) is twice their G.M., then a:b is                   |
|      | (A)               | $6 + \sqrt{7} : 6 - \sqrt{7}$   | (B)              | $2 + \sqrt{3} : 2 - \sqrt{3}$                          |
|      | (C)               | $5 + \sqrt{6} : 5 - \sqrt{6}$   | (D)              | None of these  |
| 199. | $\lim_{x\to 0} x$ | $\sin(e^{1/x})$ is equal to   |                  |  |
|      | (A)               | 0   | (B)              | 1  |
|      | (C)               |   | (D)              | Does not exist   |
| 200. | Differ            | rential coefficient of $e^{x^2}$ with respect to log                    | x² is            |  |
|      | (A)               | $e^{x^2}$   | (B)              | $xe^{x^2}$   |
|      | (C)               | $x^2 e^{x^2}$   | (D)              | $2x^2e^{x^2}$  |

| Sr. | Question |
|-----|----------|
| No. |          |

| Among the following, the most stable complex is |     |                     |
|---|-----|---------------------|
| (A) $[Fe(H_2O)_6]^{3+}$                         | (B) | $[Fe(NH_3)_6]^{3+}$ |
| (C) $[Fe(C_2O_4)_3]^3$                          | (D) | $[Fe(Cl)_6]^{3-1}$  |

1.

2. Which is the correct coordination number (C.N) and oxidation number (O.N) of the transition metal atom in  $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ? C.N=4, O.N=+2

| (A) | C.N=3, O.N=+1 | (B) | C.N=4, O.N=+2 |
|-----|---------------|-----|---------------|
| (C) | C.N=6, O.N=+1 | (D) | C.N=6, O.N=+3 |

3. In a solid, oxide ions are arranged in ccp, cations A occupy one sixth of the tetrahedral voids and cation B occupy one third of the octahedral voids. The formula of the solid is:

|                          | 1.2     |     |                   |
|--------------------------|---------|-----|-------------------|
| (A)                      | $ABO_3$ | (B) | A <sub>3</sub> BO |
| $\langle \alpha \rangle$ |         |     |                   |

(C) AB<sub>3</sub>O (D)  $A_3B_3O_3$ 

4. On mixing acetone to methanol some of the hydrogen bonds between methanol molecules break. Which of the following statements is correct about the above process?

|     | 0  |     | 1                                   |
|-----|--|-----|-------------------------------------|
| (A) | At specific composition methanol acetone | (B) | At specific composition methanol    |
|     | mixture will form minimum boiling        |     | acetone mixture will form maximum   |
|     | azeotrope and show positive deviation    |     | boiling azeotrope and show positive |
|     | from Raoult's law                        |     | deviation from Raoult's law         |
| (C) | At specific composition methanol acetone | (D) | At specific composition methanol    |
|     | mixture will form minimum boiling        |     | acetone mixture will form maximum   |
|     | azeotrope and show negative deviation    |     | boiling azeotrope and show negative |
|     | from Raoult's law                        |     | deviation from Raoult's law         |

 $K_{\rm H}$  value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10<sup>-5</sup> 5. and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is:

- (A) formaldehyde<methane<carbon (B) formaldehyde< carbon dioxide dioxide<argon <methane<argon argon<carbon dioxide< argon <methane <carbon dioxide (C) (D) methane<formaldehyde <formaldehyde
- 6. The number of faradays of electricity required for electrolytic conversion of the mole of nitrobenzene to aniline is:

| (A) | 3F | (B) | 4F |
|-----|----|-----|----|
| (C) | 6F | (D) | 5F |

- 7. The positive value of the standard electrode potential of  $Ag^+/Ag$  indicates that:
  - This redox couple is a stronger reducing (B) This redox couple is a stronger oxidizing agent than H<sup>+</sup>/H<sub>2</sub> couple Ag can displace  $H_2$  from base
  - (C) Ag can displace  $H_2$  from acid (D)

A decrease in the fraction of particles

- 8. Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The decrease in reaction rate is due to:
  - A decrease in surface area (A)

possessing sufficient energy

agent than  $H^+/H_2$  couple

(A)

(C)

- A decrease in  $\triangle$  H for the reaction (B)
- The introduction of an alternative (D) pathway with greater activation energy.

- 9. Which of the following statements is not correct?
  - (A) The rate of a reaction decreases with passage of time as concentration of reactants decrease
  - (C) For a zero order reaction the concentration of reactants remains changed with passage of time
- (B) The instantaneous rate a reaction is same at any time during the reaction
- (D) The rate of a reaction decreases with increase in concentration of reactant (s)
- 10. Which of the following gases shows the lowest adsorption per gram of charcoal? The critical temperatures are given in parenthesis:
  - (A)  $H_2(33K)$  (B)  $CH_4(190K)$
  - (C)  $SO_2(630K)$  (D)  $CO_2(304K)$
- 11. Freundlich adsorption isotherm is given by the expression  $x/m=kp^{1/n}$ . Which of the following statements are false?
  - i. When 1/n=0, the adsorption is independent of pressure.
  - ii. When n=0, the plot of x/m vs p graph is a line parallel to x axis.
  - iii. When 1/n=0, the adsorption is directly proportional to pressure.
  - iv. When n=0, plot of x/m vs p is a curve
  - (A) i and ii (B) ii and iv
  - (C) i and iii (D) all are false
- 12. In the extraction of chlorine by electrolysis of an aqueous solution of sodium chloride, which of the following statements are true?
  - i.  $\triangle G^0$  for the overall reaction is positive
  - ii.  $\triangle G^0$  for the overall reaction is negative
  - iii.  $E^0$  for the overall reaction is positive
  - iv.  $E^0$  for the overall reaction is negative
  - (A) i and iv(B) i and iii(C) ii and iii(D) iii and iv
- 13. Which of the following pairs of ions are isoelectronic and isostructural?
  - (A)  $NO_2^+$  and  $NO_3^-$ (B)  $CIO_3^-$  and  $ICl_4^-$ (D)  $CIO_3^-$  and  $SO_3^{2-}$
- 14. Which of the following hydrides is the strongest reducing agent?
  - $\begin{array}{cccc} (A) & NH_3 & & (B) & PH_3 \\ (C) & AsH_3 & & (D) & SbH_3 \end{array}$
- 15. Consider the reactions,
  - i.  $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (NO_3)_2 + X + H_2O$
  - ii.  $Zn + dil. HNO_3 (cold) \longrightarrow Zn (NO_3)_2 + Y + H_2O$
  - $\begin{array}{c} Compounds \ X \ and \ Y \ are, \ respectively \\ (A) \quad N_2O, \ NO \\ (C) \quad N_2, \ N_2O \\ \end{array} \begin{array}{c} (B) \quad NO_2, \ NO_2 \\ (D) \quad NO_2, \ NO \\ \end{array}$
- 16. When KMnO<sub>4</sub> acts as an oxidizing agent in weakly alkaline medium, the oxidation number of manganese decreases by:

| Buildse acciences of . |   |     |   |  |  |  |
|------------------------|---|-----|---|--|--|--|
| A)                     | 1 | (B) | 2 |  |  |  |
| C)                     | 3 | (D) | 5 |  |  |  |

17. Acidified potassium dichromate solution turns green when Na<sub>2</sub>SO<sub>3</sub> is added to it due to the formation of:

| (A) | CrSO <sub>4</sub>           | (B) | $Cr_2(SO_4)_3$ |
|-----|-----------------------------|-----|----------------|
| (C) | $\operatorname{CrO_4^{2-}}$ | (D) | $Cr_2(SO_3)_3$ |

| 18. | The d-electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ and $Co^{2+}$ are $d^4$ , $d^5$ , $d^6$ and $d^7$ , respectively. Which one of the following complexes will exhibit minimum paramagnetic behavior? (atomic numbers of Cr=24, Mn=25, Fe=26, Co=27) |  |  |  |
|-----|--|--|--|--|
|     | (A) $[Cr(H_2O)_6]^{2^+}$<br>(C) $[Fe(H_2O)_6]^{2^+}$   | (B) $[Mn(H_2O)_6]^{2+}$<br>(D) $[Co(H_2O)_6]^{2+}$   |  |  |
| 19. | When 2-Bromopentane is heated with potassium   | ethoxide in ethanol, the major product obtained  |  |  |
|     | is:<br>(A) 2-Ethoxypentane<br>(C) Cis-Pent-2-ene   | <ul><li>(B) Pent-1-ene</li><li>(D) Trans-Pent-2-ene</li></ul>  |  |  |
| 20. | <ul><li>Which of the following undergoes nucleophilic s</li><li>(A) Chloroethane</li><li>(C) Chlorobenzene</li></ul>   | <ul> <li>ubstitution exclusively by S<sub>N</sub><sup>1</sup>mechnism?</li> <li>(B) Isopropyl chloride</li> <li>(D) Benzyl chloride</li> </ul> |  |  |
| 21. | The number of possible stereoisomers for CH <sub>3</sub> CH<br>(A) 8<br>(C) 4  | $\begin{array}{cc} \text{H=CHCH}_2\text{CH(Br)CH}_3 \text{ is:} \\ \text{(B)} & 2 \\ \text{(D)} & 6 \end{array}$                               |  |  |
| 22. | <ul><li>2-Methoxy-2-methylpropane on heating with HI</li><li>(A) Methanol and sec-propyl iodide</li><li>(C) Methyl iodide and isobutene</li></ul>  | produces:<br>(B) Methyl iodide and tert-butyl alcohol<br>(D) Methanol and tet-butyl iodide   |  |  |
| 23. | <ul><li>The least acidic compound among the following</li><li>(A) o-Nitrophenol</li><li>(C) p-Nitrophenol</li></ul>  | is:<br>(B) m-Nitrophenol<br>(D) Phenol   |  |  |
| 24. | An alkene $C_7H_{14}$ on reductive ozonolysis gives as<br>The ketone is:   | n aldehyde with formula $C_3H_6O$ and a ketone.  |  |  |
|     | <ul><li>(A) 2-Butanone</li><li>(C) 3-Pentanone</li></ul>   | <ul><li>(B) 2-Pentanone</li><li>(D) Propanone</li></ul>  |  |  |
| 25. | The increasing order of the rate of addition of HC Acetone iii) Acetophenone iv) benzophenone  | CN to the compounds i) Formaldehyde ii)  |  |  |
|     | (A) $i < ii < iii < iv$<br>(C) $iv < iii < ii < i$   | (B) $iv < ii < iii < i$<br>(D) $iv < i < ii < iii$   |  |  |
| 26. | The carboxylic acid that does not undergo Hell-V   | ohlard-Zelinsky reaction is:   |  |  |
|     | (A) $CH_3COOH$<br>(C) $CH_3CH_2CH_2COOH$   | (B) $(CH_3)_2CHCOOH$<br>(D) $(CH_3)_3CCOOH$  |  |  |
| 27. | $C_2H_5NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y$   | $\xrightarrow{NH_3} Z.$  |  |  |
|     | In the above sequence, Z is:<br>(A) cyanoethane<br>(C) methanamine   | <ul><li>(B) ethanamide</li><li>(D) ethanamine</li></ul>  |  |  |
| 28. | The attachment of which of the following group   | at para position in aniline will raise the $K_{\rm b}$   |  |  |
|     | value?   |  |  |  |
|     | (A) $-5U_3H$<br>(C) $-F$   |  |  |  |
| 29. | Which of the following is an example of globular   | protein?   |  |  |
|     | <ul><li>(A) myosin</li><li>(C) keratin</li></ul>   | <ul><li>(B) collagen</li><li>(D) Haemoglobin</li></ul>   |  |  |

| 30. | Which<br>(A)<br>(C)                         | h one of the following is synthesized in our b<br>Vitamin D<br>Vitamin K   | ody by<br>(B)<br>(D)            | / sun rays?<br>Vitamin B<br>Vitamin A  |
|-----|---|--|---------------------------------|--|
| 31. | Capro                                       | plactum is the is the starting material for the s  | ynthes                          | sis of   |
|     | (A)<br>(C)                                  | Nylon-6<br>Terylene  | (B)<br>(D)                      | Nylon6,6<br>Nylon 10   |
| 32. | The s<br>(A)<br>(C)                         | pecies which can serve as an initiator for cati<br>Lithium aluminium hydride<br>Aluminium chloride   | onic p<br>(B)<br>(D)            | olymerization is<br>Nitric acid<br>BuLi  |
| 33. | Aspir<br>(A)<br>(C)                         | in is an:<br>analgesic<br>antimalarial   | (B)<br>(D)                      | antipyretic<br>Both analgesic and antipyretic  |
| 34. | The e<br>(A)<br>(C)                         | equivalent mass of iron in the reaction 2Fe + 3<br>Half of its atomic mass<br>Same as atomic mass  | $BCl_2 \rightarrow (B)$<br>(D)  | <ul> <li>2FeCl<sub>3</sub> is:</li> <li>One third of its atomic mass</li> <li>One fourth of its atomic mass</li> </ul>               |
| 35. | Whick<br>(A)<br>(C)                         | h of the following sets of quantum numbers is<br>n=4, l=3, m=4, s = $+1/2$<br>n=4, l=3, m=+1, s = $+1/2$   | s corre<br>(B)<br>(D)           | ect for an electron in 4f subshell?<br>n=4, $l=3$ , $m=-4$ , $s = -1/2n=3$ , $l=2$ , $m=-2$ , $s = +1/2$                             |
| 36. | The c<br>(A)<br>(C)                         | orrect sequence of atomic radii is:<br>Na>Mg>Al>Si<br>Si>Al>Mg>Na  | (B)<br>(D)                      | Al>Si>Na>Mg<br>Si>Al>Na>Mg   |
| 37. | In wh<br>(A)<br>(C)                         | ich of the following, the bond angle around t<br>NH <sub>3</sub><br>PCl <sub>3</sub>   | he cen<br>(B)<br>(D)            | tral atom is maximum?<br>NH4 <sup>+</sup><br>SCl2  |
| 38. | Whick<br>(A)<br>(C)                         | h of the following molecule does not exist<br>NF <sub>3</sub><br>PF <sub>5</sub>   | (B)<br>(D)                      | $NF_5$<br>$N_2H_4$   |
| 39. | If hel<br>(A)<br>(C)                        | ium is allowed to expand in vacuum, it libera<br>It is an inert gas<br>Its critical temp. is low   | tes hea<br>(B)<br>(D)           | at because<br>It is an ideal gas<br>It is a light gas  |
| 40. | i) H <sub>2</sub> (<br>reacti<br>(A)<br>(C) | $(g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ ii) $H_2(g) + ons,$<br>x > y<br>x = y   | 1/2O <sub>2</sub><br>(B)<br>(D) | $(g) \rightarrow H_2O(g) + y \text{ KJ}$ ; For the given two<br>x < y<br>x + y = 0   |
| 41. | If the<br>respective<br>(A)<br>(C)          | bond dissociation energies of XY, $X_2$ , $Y_2$ (all<br>ctively and $\Delta_f H$ of XY is -200KJmol <sup>-1</sup> , the bo<br>400 KJmol <sup>-1</sup><br>200 KJmol <sup>-1</sup> | l diato<br>nd dis<br>(B)<br>(D) | mic molecules) are in the ratio 1:1:0.5,<br>sociation energy of $X_2$ will be:<br>300 KJmol <sup>-1</sup><br>100 KJmol <sup>-1</sup> |
| 42. | What<br>amon                                | will be the correct order of vapour pressure of g these compounds water has maximum boili  | of wate<br>ing poi              | er, ethanol and ether at 30 <sup>0</sup> C? Given that int and ether has minimum boiling point.                                      |
|     | (A)   | Water <ether<ethanol< td=""><td>(B)</td><td>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<>   | (B)                             | Water <ethanol<ether< td=""></ethanol<ether<>  |
|     | (C)   | Ether <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>   | (D)                             | Ethanol <ether<water< td=""></ether<water<>  |
|     |   |  |                                 |  |

| 43. | Which of the following will occur if a 0.1M solution of a weak acid is diluted to 0.01M at constant temperature? |                  |  |  |
|-----|--|------------------|--|--|
|     | <ul> <li>(A) [H<sup>+</sup>] will decrease to 0.001M</li> <li>(C) Percentage ionization will increase</li> </ul> | (B)<br>(D)       | pH will decrease<br>K <sub>a</sub> will increase   |  |
| 44. | Which of the following species involves the transf   | fer of 5         | $N_A$ electrons per mole of it ?   |  |
|     | (A) $MnO_4^2 \rightarrow MnO_4^2$<br>(C) $MnO_4^2 \rightarrow MnO_4$   | (B)<br>(D)       | $MnO_4^- \rightarrow Mn^{2+}$ $CrO_4^{2-} \rightarrow Cr^{3+}$                                 |  |
| 15  | 30-volume hyderogen perovide means:  | (D)              |  |  |
| чЈ. | (A) $30\%$ H <sub>2</sub> O <sub>2</sub> by volume   | (B)              | $30g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of }$                           |  |
|     | (C) 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ gas at STP                               | (D)              | $30 \text{ cm}^3$ of the solution contains one mole of $H_2O_2$                                |  |
| 46. | The correct sequence of covalent character is repr   | esented          | l by:  |  |
|     | (A) $LiCl < NaCl < BeCl_2$<br>(C) $NaCl < LiCl < BeCl_2$   | (B)<br>(D)       | BeCl <sub>2</sub> <licl<nacl<br>BeCl<sub>2</sub><nacl<licl< td=""></nacl<licl<></licl<nacl<br> |  |
| 47. | Which of the following is known as pyrene?   |                  |  |  |
|     | $ \begin{array}{ccc} (A) & CCl_4 \\ (C) & S_2Cl_2 \end{array} $  | (B)<br>(D)       | $CS_2$<br>Solid CO <sub>2</sub>  |  |
| 18  | $(C)$ $S_2C_1$   | σis <sup>.</sup> |  |  |
| 10. | (A) $(CH_3)_2CH^+$   | (B)              | $Ph_3C^+$  |  |
|     | (C) $CH_3CH_2^+$   | (D)              | $CH_2 = CH - CH_2^+$   |  |
| 49. | The molecule that will have dipole moment is:<br>(A) $-22$ Dimethylpropene                                       | <b>(D)</b>       | aia 2 Dutana   |  |
|     | (C) trans-2-Butene   | (D)              | 2,2,3,3-Tetramethylbutane  |  |
| 50. | Of the five isomeric hexanes, the isomer which ca  | n give           | two monochlorinated compound is:   |  |
|     | (A) 2-Methylpentane  | (B)              | 2,2-Dimethylbutane   |  |
| 51  | (C) 2,5-Dimensional SACHIN are arranged in   | (D)              | n-riexane  |  |
| 51. | out as in dictionary, then the word SACHIN are arranged in   | an pos           | erial number   |  |
|     | (A) 601  | (B)              | 600  |  |
| 52  | (C)  603   | (D)              |  |  |
| 52. | remain empty is  | lis in 3         | distinct boxes so that none of the boxes   |  |
|     | (A) $5^{(A)}$  | (B)              | 21<br>80   |  |
| 52  | $(C)  3^{3}$   | (D)              | $C_3$  |  |
| 53. | appear adjacently is   | vora B           | ANANA in which the two N s do not  |  |
|     | (A) 40   | (B)              | 60   |  |
|     | (C) 80   | (D)              | 100  |  |
| 54. | Number of divisors of the form $4n+2$ (n $\geq 0$ ) of the (A) 4   | (R)              | r 240 is<br>8  |  |
|     | (C) = 10   | (D)              | 3  |  |
|     |  |                  |  |  |

| 55. | 6 men                  | and 4 women are to be seated in a row so that  | at no t              | wo women sit together. The number of  |
|-----|------------------------|--|----------------------|---|
|     | (A)<br>(C)             | 604800<br>120960   | (B)<br>(D)           | 17280<br>518400   |
| 56. | If the (A)<br>(C)      | cube roots of unity are $1, \omega, \omega^3$ , then the roots<br>-1, $-1 + 2\omega$ , $-1 - 2\omega^2$<br>-1, $1-2\omega$ , $1-2\omega^2$ | of the<br>(B)<br>(D) | e equation $(x-1)^3 + 8 = 0$ are<br>-1, -1, -1<br>-1, 1+2 $\omega$ , 1+2 $\omega^2$ |
| 57. | If $z_1$ at $(z_2)$ is | nd $z_2$ are two non-zero complex numbers such equal to $\pi$  | h that               | $ z_1 + z_2  =  z_1  +  z_2 $ , then arg $(z_1)$ - arg<br>$\pi$                     |
|     | (A)<br>(C)             | $\overline{\frac{2}{0}}$   | (B)<br>(D)           | $-\frac{1}{2}$  |
| 58. | If arg<br>(A)<br>(C)   | (z) < 0, then arg (-z) – arg (z) =<br>$\pi$<br>$-\pi/2$  | (B)<br>(D)           | $-\pi$<br>$\pi/2$   |
| 59. | If ω is<br>(A)<br>(C)  | an imaginary cube root of unity, then $(1+\varpi-\alpha)$<br>128 $\varpi$<br>128 $\varpi^2$  | $(B)^{(D)}$          | $\begin{array}{c} \text{[uals]}\\ -128 \ \varpi \\ -128 \ \varpi^2 \end{array}$     |
| 60. | The po<br>and or       | boints z1, z2, z3, z4 in the complex plane are t<br>hly if $z^{-1} + z^{-2} + z^{-2}$  | he ver               | tices of a parallelogram taken in order if $-1 + -2 = -2 + -4$                      |
|     | (A)<br>(C)             | $z_1 + z_4 = z_2 + z_3$<br>$z_1 + z_2 = z_3 + z_4$   | (B)<br>(D)           | Z1 + Z3 = Z2 + Z4<br>None of these  |
| 61. | Let R<br>12}. T        | $= \{(3,3) (6,6) (9,9) (12,12), (6,12) (3,9) (3,12)$<br>The relation is  | 2), (3,6             | b)}be in a relation on the set $A = \{3, 6, 9, \dots\}$                             |
|     | (A)<br>(C)             | Reflexive and transitive<br>An equivalence relation  | (B)<br>(D)           | Reflexive only<br>Reflexive and symmetric only                                      |
| 62. | If a rea<br>(a+y),     | al valued function $f(x)$ satisfies the functional where 'a' is a given constant and $f(0) = 1$ , the                                      | ll equa<br>en f (2   | tion $f(x-y) = f(x) f(y) - f(a-x) f(a-x)$<br>a-x) is equal to                       |
|     | (A)<br>(C)             | $ \begin{array}{l} -f(x) \\ f(x) + f(a-x) \end{array} $  | (B)<br>(D)           | f (x)<br>f (-x)   |
| 63. | If the<br>(A)<br>(C)   | graph of the function $f(x)$ is symmetrical abo<br>f(x+2) = f(x-2)<br>f(x) = f(-x)   | (B)<br>(D)           | line x=2, then<br>f(2+x) = f(2-x)<br>f(x) = -f(-x)                                  |
| 64. | The fu<br>(A)<br>(C)   | unction $f: R \to R$ defined by $f(x) = \sin x$ is<br>into<br>one-one  | (B)<br>(D)           | onto<br>many-one  |
| 65. | In a co<br>studer      | ollege of 300 students, every student reads 5 nats. The number of newspapers is  | newspa               | apers and every newspaper is read by 60   |
|     | (A)<br>(C)             | At least 30<br>Exactly 25  | (B)<br>(D)           | At most 20<br>None of these   |
| 66. | The va                 | alue of a for which the sum of the squares of the least value is   | the roo              | bts of the equation $x^2 - (a - 2) x - a - 1 = 0$                                   |
|     | (A)<br>(C)             | 1 3  | (B)<br>(D)           | 0<br>2  |

| 67. | If the roots of the equation $x^2 - bx + c = 0$ be two of<br>(A) $-2$<br>(C) $2$   | consecutive integers, then $b^2 - 4c$ equals<br>(B) 3<br>(D) 1   |
|-----|--|--|
| 68. | If $(1-p)$ is a root of quadratic equation $x^2 + px + (1 (A) 0, 1 (C) 0, -1$  | (-p) = 0, then the roots are<br>(B) - 1, 1<br>(D) - 1, 2   |
| 69. | The number of real solutions of the equation $x^2 - 3$<br>(A) 2<br>(C) 1   | x  + 2 = 0 is/are<br>(B) 4<br>(D) 3  |
| 70. | If $x^2 + 2ax + 10 - 3a > 0$ for every real value of x,<br>(A) $a > 5$<br>(C) $-5 < a < 2$   | then<br>(B) $a < -5$<br>(D) $2 < a < 5$  |
| 71. | <ul> <li>The angle between two diagonals of a cube is</li> <li>(A) 45°</li> <li>(C) 90°</li> </ul>   | (B) $60^{\circ}$<br>(D) $\tan^{-1}2\sqrt{2}$   |
| 72. | If the angle between two vectors $\vec{i} + \vec{k}$ and $\vec{i} - \vec{j} + \vec{k}$<br>(A) 2<br>(C) -2  | + $a\vec{k}$ is $\pi/3$ , then the value of a is<br>(B) 4<br>(D) 0   |
| 73. | The scalar $\vec{A} \cdot (\vec{B} + \vec{C}) \times (\vec{A} + \vec{B} + \vec{C})$ equals<br>(A) 0<br>(C) $[\vec{A} \ \vec{B} \ \vec{C}]$               | (B) $\begin{bmatrix} \vec{A} & \vec{B} & \vec{C} \end{bmatrix} + \begin{bmatrix} \vec{B} & \vec{C} & \vec{A} \end{bmatrix}$<br>(D) None of these |
| 74. | The points with position vectors $60\hat{i} + 3\hat{i}, 40\hat{i} - 8\hat{i}$<br>(A) $a=-40$<br>(C) $a=20$   | $\begin{array}{l} B\hat{j}, a\hat{i} - 52\hat{j}  \text{are collinear if} \\ (B)  a=40 \\ (D)  \text{None of these} \end{array}$                 |
| 75. | <ul><li>The number of vectors of unit length perpendicula</li><li>(A) one</li><li>(C) three</li></ul>  | The result of the formula $\vec{a} = (0 \ 1, 1)$ and $\vec{b} = (1 \ 1, 0)$ is<br>(B) two<br>(D) infinite  |
| 76. | The angle between the lines $2x = 3y = -z$ and $6x = (A) = 0^{\circ}$<br>(C) $45^{\circ}$  | $ \begin{array}{c} -y = -4z \text{ is} \\ (B) & 90^{\circ} \\ (D) & 30^{0} \end{array} $   |
| 77. | Distance between two parallel planes $2x + y + 2z = (A) = 3/2$<br>(C) $7/2$  | = 8 and $4x + 2y + 4z + 5 = 0$ is<br>(B) $5/2$<br>(D) $9/2$  |
| 78. | <ul><li>The method of least squares dictates that we choose of deviations of the points from the line is:</li><li>(A) Maximum</li><li>(C) Zero</li></ul> | <ul><li>(B) Minimum</li><li>(D) Positive</li></ul>   |
| 79. | <ul><li>If the value of any regression coefficient is zero, th</li><li>(A) Qualitative</li><li>(C) Dependent</li></ul>                                   | <ul><li>hen two variables are:</li><li>(B) Correlated</li><li>(D) Independent</li></ul>  |
| 80. | <ul><li>A process by which we estimate the value of dependent variables is called:</li><li>(A) Correlation</li><li>(C) Residual</li></ul>                | <ul><li>ndent variable on the basis of one or more</li><li>(B) Regression</li><li>(D) Slope</li></ul>  |

| 81. | If $A = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$ , then $A^3 =$   |                    |   |
|-----|---|--------------------|---|
|     | (A) A   | (B)                | 2A  |
|     | (C) 3A  | (D)                | 4A  |
| 82. | The value of $\begin{vmatrix} 1+x & 1 & 1\\ 1 & 1+y & 1\\ 1 & 1 & 1+z \end{vmatrix}$ is equal to              |                    |   |
|     | $\begin{array}{ccc} (A) & 1+x+y+z \\ (C) & z=z \end{array}$   | (B)                | x+y+z                                       |
|     | (C) xyz   | (D)                | xyz+xy+xz+yz                                |
| 83. | If $A^2 - A + I = 0$ , then the inverse of A is   |                    |   |
|     | (A) A   | (B)                | A–I   |
|     | (C) I-A   | (D)                | I   |
| 84. | The number of bijective functions from a set A to i   | tself w            | when A contains 106 elements is             |
|     | (A) 106   | (B)                | 106 <sup>3</sup>                            |
|     | (C) 106 !   | (D)                | 2 <sup>106</sup>                            |
|     |   |                    |   |
| 85. | The value of $\begin{bmatrix} 11 & 12 & 13 \\ 12 & 12 & 14 \end{bmatrix}$ is                                  |                    |   |
|     | 13 14 15  |                    |   |
|     | (A) 1   | (B)                | 0   |
|     | (C) $-1$  | (D)                | 67  |
| 86. | The mean deviation of the data 3, 10, 10, 4, 7, 10, 5   | 5 from             | the mean is                                 |
|     | (A) 2   | (B)                | 2.57  |
|     | (C) 3   | (D)                | 3.75  |
| 87  | The standard deviation of the data 6 5 9 13 12 8  | 10 is              |   |
| 011 | (A) <b>[</b> 72]  | (B)                | 52  |
|     | 52  |                    | 7   |
|     | $\sqrt{\frac{1}{2}}$  |                    |   |
|     | (C) $\sqrt{6}$  | (D)                | 6   |
| 88. | Let a, b, c, d, e be the observations with mean m an<br>of the observations a+k, b+k, c+k, d+k, e+k is        | ıd stan            | dard deviation s. The standard deviation    |
|     | (A) ks  | (B)                | S   |
|     | (C) $s+k$   | (D)                | s/k   |
| 89. | Coefficients of variation of two distributions are 50<br>25, respectively. Difference of their standard devia | ) and 6<br>tions i | 50, and their arithmetic means are 30 and s |
|     | (A) 2.5   | (B)                |   |
|     | (C) 1.5   | (D)                | 0   |
| 90. | Consider the first 10 positive integers. If we multip<br>number, the variance of the numbers so obtained is   | ly eac             | h number by -1 and then add 1 to each       |
|     | (A) 8.25  | (B)                | 6.50  |
|     | (C) 3.87  | (D)                | 2.87  |
|     |   |                    |   |

| 91.         | For a<br>(A)<br>(C)          | linear programming equations, convex set of<br>Feasible solutions<br>Profit solutions | equati<br>(B)<br>(D) | ions is included in the region of<br>Disposed solutions<br>Loss solutions |
|-------------|------------------------------|---|----------------------|---|
| 92.         | Infeas<br>all co             | sibility means that the number of solutions to nstraints is                           | the lin              | near programming models that satisfies                                    |
|             | (A)<br>(C)                   | at least 1<br>An infinite number  | (B)<br>(D)           | 0<br>At least 2   |
| 93.         | A con<br>(A)                 | straint that does not affect the feasible region<br>Non-negativity constraint         | is a<br>(B)          | Redundant constraint  |
|             | (C)                          | Standard constraint   | (D)                  | Slack constraint  |
| 94.         | Consi<br>0. The              | der the following LPP. Maximize $3x_1 + 8x_2$ s<br>e optimal value of the function is | ubject               | to $2x_1 + 5x_2 \le 10,  6x_1 + x_2 \le 6,  x_1,  x_2 \ge$                |
|             | (A)                          | 0   | (B)                  | 3   |
|             | (C)                          | $\frac{111}{7}$   | (D)                  | 10  |
| 95.         | For li                       | near inequalities, solution set for a group of in                                     | nequal               | lities is classified as   |
|             | (A)                          | Concave set   | (B)                  | Convex set  |
|             | (C)                          | Loss set  | (D)                  | Profit set  |
| 96.         | Whick                        | h of the following is unary operations?   |                      |   |
|             | (A)                          | Addition<br>Square root   | (B)<br>(D)           | Multiplication  |
|             | (0)                          | Square root   | (D)                  | None of these   |
| 97.         | If $*$ is                    | a binary operation in A then  | $(\mathbf{B})$       | A is not closed under *   |
|             | $(\mathbf{C})$               | A is not closed under +   | (D)                  | A is closed under –   |
| 98          | Whiel                        | h of the following statements is not correct?   |                      |   |
| <i>J</i> 0. | (A)                          | $Log_{10} = 1$  | (B)                  | $Log (2 + 3) = log (2 \times 3)$  |
|             | (C)                          | $\mathrm{Log}_{10} \ 1 = 0$   | (D)                  | Log (1+2+3) = log 1 + log 2 + log 3                                       |
| 99.         | If log                       | $(a/b) + \log (b/a) = \log (a+b)$ , then  |                      |   |
|             | (A)                          | a+b=1   | (B)                  | a-b=1   |
|             | (C)                          | a=b   | (D)                  | $a^2 - b^2 = 1$   |
| 100.        | The v                        | alue of e is  |                      |   |
|             | (A)                          | 0 2.718   | (B)                  | 1 2 14  |
|             | (C)                          | 2./10   | (D)                  | 2.14  |
| 101.        | 1+ sir                       | $f(x) + \sin^2 x + \dots$ up to $\infty = 4 + 2\sqrt{3}, 0 < x < \Pi$                 | and x                | $\neq \frac{\pi}{2}$ then x =   |
|             | (A)                          | $\frac{\pi}{6}, \frac{\pi}{3}$  | (B)                  | $\frac{\pi}{3}, 5\frac{\pi}{6}$   |
|             | (C)                          | $2\frac{\pi}{3}, \frac{\pi}{6}$   | (D)                  | $\frac{\pi}{3}, 2\frac{\pi}{3}$   |
| 102.        | A cov                        | v is tied to a post by a rope. The cow moves a  | long t               | he circular path always keeping the rope                                  |
|             | tight.                       | If it describes 44 meters, when it has traced of                                      | out $72^{\circ}$     | at the centre, the length of the rope is                                  |
|             | (A)<br>(C)                   | 55 meters<br>56 meters  | (D)<br>(B)           | 45 meters   |
|             | $\langle \mathbf{v} \rangle$ |   | (~)                  |   |

| 103. | If f(                         | $x) = \int_{-\infty}^{x}  t   dt, for any  x \ge 0, f(x) =$                                   |                  |   |
|------|-------------------------------|---|------------------|---|
|      | (A)                           | $\frac{1}{2}(1-x^2)$  | (B)              | $1 - x^2$                                       |
|      | (C)                           | $\frac{1}{2}(1+x^2)$  | (D)              | $1 + x^2$                                       |
| 104. | The to                        | otal of number of terms in the expansion of (x  | $(x)^{10}$       | $x^{0} + (x-y)^{100}$ after simplification is   |
|      | (A)<br>(C)                    | 50<br>202   | (B)<br>(D)       | 51<br>100                                       |
| 105. | The n                         | naximum value of $\frac{\log x}{r}$ in $(2,\infty)$ is  |                  |   |
|      | (A)                           | 1   | (B)              | 2   |
|      | (C)                           | e   | (D)              | e<br>1  |
|      |                               |   |                  | e   |
| 106. | The s                         | eries $\frac{1}{2\cdot 5} + \frac{1}{5\cdot 8} + \frac{1}{8\cdot 11} + \dots \dots up$ to n t | erms             | is equal to                                     |
|      | (A)                           | $\frac{n}{4\pi + 6}$  | (B)              | 1   |
|      | (C)                           | $\frac{4n+6}{n}$  | (D)              | 6n+4  |
| 107  |                               | 6n + 4  |                  | 3 <i>n</i> + 7                                  |
| 107. | $\lim_{x \to 1} \frac{ta}{-}$ | $\frac{\ln(x^2-1)}{x-1}$ equals   |                  |   |
|      | (A)                           | 2   | (B)              | $\frac{1}{2}$                                   |
|      | (C)                           | -2  | (D)              | $\frac{2}{-\frac{1}{2}}$                        |
| 108. | If x <sup>m</sup>             | $dy^n = (x + y)^{m+n}$ then $\frac{dy}{dy}$ is equal to                                       |                  |   |
|      | (A)                           | $\frac{x+y}{x+y}$ dx  | (B)              | xy  |
|      | (C)                           | xy<br>0   | (D)              | <u>y</u>  |
| 100  |                               | (1) dy  |                  | x   |
| 109. | If $y =$                      | $= e^{\sin^{-1}(t^2 - 1)} and x = e^{\sec^{-1}(\frac{1}{t^2 - 1}) then \frac{dy}{dx} i}$      | s equa           | l to<br>V                                       |
|      | (A)                           | $\frac{x}{y}$   | (D)              | $-\frac{y}{x}$                                  |
|      | (C)                           | $\frac{y}{x}$   | (D)              | $-\frac{x}{y}$                                  |
| 110. |                               | $1^2$   | 1 <sup>2</sup> - | $-2^2$ , $1^2 + 2^2 + 3^2$                      |
|      | Fina (A)                      | the sum of 1° n terms of the series $\frac{1}{1}$ + $n+2$                                     | $-\frac{1}{(B)}$ | $\frac{-2}{n(n+2)}$ + $\frac{1+2+3}{n(n+2)}$ +, |
|      | $(\mathbf{C})$                | $\frac{3}{n(n-2)}$  |                  | $\frac{3}{n(n-2)}$                              |
|      | (C)                           | $\frac{n(n-2)}{3}$  | (D)              | $\frac{n(n-2)}{6}$                              |
|      |                               |   |                  |   |

| 111. | The v                 | value of $\tan \frac{\pi}{8}$ is equal to   |                                 |  |
|------|-----------------------|---|---------------------------------|--|
|      | (A)                   | $\frac{1}{2}$   | (B)                             | $\sqrt{2} + 1$   |
|      | (C)                   | $\frac{2}{\sqrt{2}+1}$  | (D)                             | $1 - \sqrt{2}$   |
| 112. | The s                 | olution for the differential equation $\frac{dy}{dy}$   | $\frac{dx}{dx} + \frac{dx}{dx}$ | $\dot{s} = 0$ is   |
|      | (A)                   | $\frac{1}{v} + \frac{1}{r} = c$   | (B)                             | $\log x \cdot \log y = c$  |
|      | (C)                   | xy = c  | (D)                             | x + y = c  |
| 113. | If PA                 | $A = \frac{1}{2}, PB = \frac{1}{4}, P(A \cup B) = \frac{5}{12}, then P(A \cup B) = \frac{5}{12}$  | / B) =                          | =  |
|      | (A)                   | 25 4 12   | (B)                             | 5  |
|      | (C)                   | 16<br>16  | (D)                             | 4<br>2   |
|      |                       | 25  |                                 | 3  |
| 114. | If $(a (A))$          | $-2)x^{2} + 9y^{2} = 4$ represents rectangula   | r hyp                           | erbola then a equals<br>2  |
|      | $(\mathbf{C})$        | 9   | (D)<br>(D)                      | None of these  |
| 115. | If $\sum$             | $n=55$ , then the value of $\sum n^2$ is equal  | l to                            |  |
|      | (A)<br>(C)            | 385<br>1115   | (B)<br>(D)                      | 506<br>3025  |
| 116. | (-)                   | $(1)^{14}$  | (-)                             |  |
|      | The 1                 | 1 <sup>th</sup> term in expansion of $\left(x + \frac{1}{\sqrt{x}}\right)$ is   |                                 | 1001   |
|      | (A)                   | <u></u>   | (B)                             | $\frac{1001}{r}$   |
|      | (C)                   | 1   | (D)                             | $\frac{\hat{x}}{1001}$   |
| 117. | $\int_{-\pi}^{\pi}$   | $\frac{\sin^{1000}x  dx}{\sin^{1000}x + \cos^{1000}x}$ is equal to  |                                 |  |
|      | $J_0$ St<br>(A)       | $\frac{1000x + \cos 1000x}{1000}$   | (B)                             | 1  |
|      | (C)                   | $\frac{\pi}{2}$   | (D)                             | $\frac{\pi}{4}$  |
| 118. | $f e^x$<br>(A)<br>(C) | $x^{5} dx is$ $e^{x}[x^{5} + 5x^{4} + 20x^{3} + 60x^{2} + 120x + 120] + C$ $e^{x}[x^{5} - 5x^{4} + 20x^{3} - 60x^{2} + 120x - 120] + C$ | (B)<br>(D)                      | $e^{x}[x^{5} - 5x^{4} - 20x^{3} - 60x^{2} - 120x - 120] + C$<br>$e^{x}[x^{5} + 5x^{4} + 20x^{3} - 60x^{2} - 120x + 120] + C$ |
| 119. | $\int -$              | $\frac{\sec x}{\cos x}$ dr is equal to  | (-)                             |  |
|      | J sec<br>(A)          | $x + \tan x$<br>$\tan x - \sec x + C.$  | (B)                             | $\log\left(1 + \sec x\right) + C.$   |
|      | (C)                   | $\sec x + \tan x + C.$  | (D)                             | $\log \sin x + \log \cos x + C.$   |
| 120. | If f(x)               | $x) + be^{ax} + ae^{bx}$ , then $f''(0) =$  | ( <b>P</b> )                    | 2ah  |
|      | (A) $(C)$             | ab(a+b)   | (D)                             | Ab   |
|      |                       |   |                                 |  |

| 121. | The le<br>(A)   | ength of the latus rectum of the parabol $\frac{4}{2}$   | la 4y²<br>(B)    | $x^{2} + 3x + 3y + 1 = 0$ is<br>7  |  |  |
|------|---|--|------------------|--|--|--|
|      | (C)   | 3<br>12  | (D)              | $\frac{3}{4}$  |  |  |
| 122. | Thon  | rincipal value of $\sin^{-1} \tan\left(-\frac{5\pi}{3}\right)$ is                                      |                  |  |  |  |
|      | $(\Delta)$  | $\pi$  | (B)              | π  |  |  |
|      | (11)  | 4  | (D)              | $-\frac{1}{4}$   |  |  |
|      | (C)   | $\frac{\pi}{2}$  | (D)              | $-\frac{n}{2}$   |  |  |
| 123. | If y =  | $e^{m \sin^{-1}x}$ , then $\frac{d^2y}{dx^2}$ at $x = 0$ is  |                  | -  |  |  |
|      | (A)   | m  | (B)              | $m^2$  |  |  |
|      | (C)   | $-m^{2}$   | (D)              | 2 <i>m</i>   |  |  |
| 124. | If $y =$  | If $y = \sin(2 \sin^{-1} x)$ , then it satisfies the differential equation                             |                  |  |  |  |
|      | (A)<br>(C)  | $(1 - x^{2})y_{2} - xy_{1} + 4y = 0.$<br>(1 - x <sup>2</sup> )y <sub>2</sub> - xy <sub>1</sub> + y = 0 | (D)              | (1 + x2)y2 - xy1 + 4y = 0.<br>(1 + x <sup>2</sup> )y <sub>2</sub> - xy <sub>1</sub> + 4y = 0 |  |  |
| 125  | (0)   | $\begin{pmatrix} 1 & x \end{pmatrix}_{2}^{2} x_{31}^{-1} = 0.$   | 1                | $(1+x)y_2 xy_1 + 1y = 0.$  |  |  |
| 123. | The v   | alue of $\cos \left[ 2 \tan^{-1} \frac{1+x}{1-x} + \sin^{-1} \frac{1-x}{1+x^2} \right]$                | is               |  |  |  |
|      | (A)   | $\sqrt{2}$   | (B)              | 1  |  |  |
| 10 ( | (C)   |  | (D)              |  |  |  |
| 126. | The equation $(A)$  | quation of the circle which touches the x-axis<br>$x^2 + y^2 - 2x + 4y + 1 = 0$                        | and w (B)        | whose centre is (1,2), is<br>$r^2 + y^2 - 2r - 4y + 1 = 0$                                   |  |  |
|      | (C)   | $x^{2} + y^{2} + 2x + 4y + 1 = 0.$   | (D)              | $x^{2} + y^{2} + 4x + 2y + 1 = 0.$   |  |  |
| 127. | The d   | if ferential equation $y \frac{dy}{dt} + x = c$ repres   | ents             |  |  |  |
|      | (A)   | A family of hyperbolas $dx$  | (B)              | A family of circles whose centres are  |  |  |
|      | ()  |  | (-)              | on the y-axis.   |  |  |
|      | (C)   | A family of parabolas  | (D)              | A family of circles whose centres are on the x-axis.   |  |  |
| 128. | A stone is thrown vertically upwards and the height x ft reached by the stone in t seconds is given |  |                  |  |  |  |
|      | by, $x^+$   | $-80t - 16t^2$ . The stone reaches the maximum l   | height (B)       | in<br>2.5s   |  |  |
|      | (C)   | 3s   | (D)              | 1.5s   |  |  |
| 129. | The a   | rea of the region bounded by $y = 2x - x$  | <sup>2</sup> and | l the x – axis is  |  |  |
|      | (A)   | $\frac{8}{-sq.units}$  | (B)              | $\frac{4}{-sa.units}$  |  |  |
|      | (C)   | 3 - 4<br>7   | (D)              | 2  |  |  |
|      | (0)   | $\frac{1}{3}$ sq. units  | (2)              | $\frac{1}{3}$ sq. units  |  |  |
| 130. | If f (  | $x) = \begin{cases} 2a - x, & -a < x < a \\ 3x - 2a, & a \le x \end{cases} $ then which                | n of th          | e following is true  |  |  |
|      | (A)   | f(x) is discontinuous at $x = a$ .   | (B)              | f(x) is not differentiable at $x = a$ .  |  |  |
|      | (C)   | $f(x)$ is differentiable at $x \ge a$ .  | (D)              | f(x) is continuous at all $x < a$ .  |  |  |

A die is tossed thrice. If getting an even number is considered as success, the variance of the 131. probability distribution is

| (A) | 3 | (B) | 1 |
|-----|---|-----|---|
|     | 4 |     | 2 |
| (C) | 1 | (D) | 2 |
|     | 4 |     | 3 |

The coordinates of the foot of the perpendicular drawn from the point (3,4) on the line 2x + y - 7 = 0 is (A)  $\left(\frac{9}{r}, \frac{17}{r}\right)$  (B) (1, 5) 132.

(C) 
$$(-5, 1)$$
 (D)  $(1, -5)$ 

| 133. | The p<br>(A)<br>(C)                            | point (5, -7) lies outside the circle<br>$x^2 + y^2 - 8x = 0$<br>$x^2 + y^2 - 5x + 7y - 1 = 0$  | (B)<br>(D)   | $x^{2} + y^{2} - 5x + 7y = 0$<br>$x^{2} + y^{2} - 8x + 7y - 2 = 0$   |
|------|--|---|--|--|
| 134. | If tan<br>(A)<br>(C)                           | $15^{\circ} = 2 - \sqrt{3}$ , then 2 tan $1095^{\circ} + \cot 975^{\circ} + t$<br>2 + $\sqrt{3}$<br>4 - 2 $\sqrt{3}$  | an (-1<br>(B)<br>(D)   | $95^{\circ}) = 4 + 2\sqrt{3} 2 - \sqrt{3}$   |
| 135. | The n<br>(A)<br>(C)                            | umber of circles touching the lines x = 0, y =<br>One<br>Four   | a and<br>(B)<br>(D)  | y = b is<br>Two<br>Infinite  |
| 136. | The c<br>(A)<br>(C)                            | order and degree of the differential equation<br>1, 5<br>2, 5   | $ \begin{array}{c} 1 + \begin{pmatrix} a \\ b \\ c \\ B \end{pmatrix} \\ (D) \end{array} $ | $ \frac{dy}{dx} \int_{-2}^{5} \int_{-2}^{\frac{1}{3}} = \frac{d^2y}{dx^2} \text{ are respectively,} $ 2, 1 2, 3      |
| 137. | $x^{2n} - \frac{1}{2}$<br>(A)<br>(C)           | $y^{2n}$ is divisible by<br>x - y<br>x + y  | (B)<br>(D)   | y – x<br>None of these   |
| 138. | Mr. X<br>attend<br>then t<br>(A)<br>(C)        | X has a 75% chance of attending the annual m<br>ds. Otherwise she has a 50% chance of attend<br>the probability that Mr. X is also there, is<br>$\frac{24}{29}$ $\frac{26}{29}$ | eet. M<br>ing. If<br>(B)<br>(D)  | This Y has an 80% chance, if Mr. X also<br>I go to the meet and see Miss Y there,<br>$\frac{25}{29}$ $\frac{27}{29}$ |
| 139. | $\int_{1}^{3} \frac{1}{\sqrt{2}}$ (A) (C)      | $\frac{\sqrt{4-x}}{\sqrt{4-x}}dx$ $\frac{0}{3}$   | (B)<br>(D)   | 1 2  |
| 140. | $\lim_{\substack{x \to 0 \\ (A)}} \frac{a}{b}$ | $\frac{\sin x - 1}{\sin x - 1}$ $\frac{\log a}{\log b}$   | (B)  | $\log\left(\frac{a}{b}\right)$   |
|      | (C)  | 1   | (D)  | 0  |

also

| 141. | The v        | alue of $\frac{C_1}{2} + \frac{C_3}{4} + \frac{C_5}{6} + \dots \dots$ where $C_1, C_3, C_5$ | a              | are the binomial coefficients of order n,              |
|------|--------------|---|----------------|--|
|      | 1S<br>(A)    | $2^{n+1} - 1$   | (B)            | $\frac{2^n - 1}{2^n - 1}$                              |
|      | (C)          | $n+1 2^{n+1}$   | (D)            | n+1<br>$2^{n+1}+1$                                     |
| 1.40 |              | $\overline{n+1}$  | (m)            | n+1  |
| 142. | The v        | alue of $\binom{n}{r} + 2 \cdot \binom{n}{r-1} + \binom{n}{r-2}$ , where                    | $\binom{n}{k}$ | denotes the binomial coefficient of order              |
|      | (A)          | $\binom{n}{r}$  | (B)            | $\binom{n+1}{r}$                                       |
|      | (C)          | $\binom{n+2}{r}$  | (D)            | None of these  |
| 143. | Whicl        | n one of the following is possible?   |                |  |
|      | (A)          | $\cos\theta = \frac{7}{3}$  | (B)            | $\sin\theta = \frac{a^2 + b^2}{a^2 - b^2}, (a \neq b)$ |
|      | (C)          | $\sec\theta = \frac{4}{5}$  | (D)            | $\tan \theta = 45$                                     |
| 144. | In the       | expansion of $\left(x^2 - \frac{1}{2x}\right)^9$ the term indep                             | enden          | t of x is  |
|      | (A)          | $T_7$   | (B)            | T <sub>6</sub>   |
|      | (C)          | $T_8$   | (D)            | T <sub>9</sub>   |
| 145. | If $x =$     | $=e^{y+e^{y+\cdots\infty}}, x>0, then \frac{dy}{dx}$ is                                     |                |  |
|      | (A)          | $\frac{x}{1+x}$   | (B)            | 1  |
|      | (C)          | 1 + x<br>1 - x  | (D)            | $x \\ 1 + x$   |
|      |              | x   |                | x  |
| 146. | $\int e^x$   | $\left(\frac{1+\sin x}{1+\cos x}\right) dx$ is  |                |  |
|      | (A)          | $\tan\left(\frac{x}{2}\right) + C$  | (B)            | $e^x \sin x + C$                                       |
|      | (C)          | $e^x \tan\left(\frac{x}{2}\right) + C$  | (D)            | $e^x + C$  |
| 147. | The fi       | unction $f(x) = [x]$ , where [x] denotes greatest   | intege         | er function is continuous at                           |
|      | (A)          | -2  | (B)            | 1.5  |
| 1.40 | (C)          |   | (D)            |  |
| 148. | If the $(A)$ | arithmetic mean of two positive numbers a ar<br>$6 \pm \sqrt{7}$ : 6 $\sqrt{7}$             | ia b (a<br>(B) | $(2+\sqrt{3}, 2)$ is twice their G.M., then a:b is     |
|      | (C)          | $5 + \sqrt{6} : 5 - \sqrt{6}$   | (D)            | None of these  |
| 149. | lim <i>x</i> | $\sin(e^{1/x})$ is equal to   |                |  |
|      | (A)          | 0   | (B)            | 1  |
|      | (C)          | $\frac{e}{2}$   | (D)            | Does not exist   |
| 150. | Differ       | rential coefficient of $e^{x^2}$ with respect to log  | x² is          |  |
|      | (A)          | $e^{x^2}$   | (B)            | $xe^{x^2}$   |
|      | (C)          | $x^2 e^{x^2}$   | (D)            | $2x^2e^{x^2}$  |

151. While walking on smooth surface one should take small steps to ensure

Large friction (A)

- Small friction (B)
- Larger normal force (C) (D) Smaller normal force
- 152. What happens to a vehicle travelling in an unbanked curved path if the friction between the road and tires suddenly disappears
  - (A) Moves along tangent (B) Moves radially in (C)
    - Moves along the curve Moves radially out (D)
- A ball of mass 0.2 kg strikes an obstacle and moves at  $60^{\circ}$  to its initial direction. If its speed 153. changes from 20m/s to 10m/s the magnitude of impulse received by the ball is -----Ns
  - (A)  $2\sqrt{7}$
- (B)  $2\sqrt{3}$
- (C)  $2\sqrt{5}$ (D)  $3\sqrt{2}$
- A spacecraft of mass 2000kg moving with 600 m/s suddenly explodes into two pieces. One piece 154. of mass 500 kg is stationary. The velocity of other part in m/s is 800
  - (A) 600 **(B)** 1500 (D) (C)



(C) 100N

(D) 80N

1000

A man of mass 40 kg is at rest between the walls. If co eff. of friction between man and wall is 156. 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



(A) F/9 (B) 3F F (C) (D) F/3

| 159. | A ma  | A man weighs 75 kg on the surface of earth. His weight on the geostationary satellite is   |   |   |  |  |
|------|---|--|---|---|--|--|
|      | (A)   | infinity   | (B)                                     | 150kg                                       |  |  |
|      | (C)   | zero   | (D)                                     | / 5/2 Kg                                    |  |  |
| 160. | g at a  | a depth of 1600 km inside the earth in m   | n/s/s is                                | 7.05  |  |  |
|      | (A)   | 6.65   | (B)                                     | 7.35  |  |  |
|      | (C)   | 8.65   | (D)                                     | 4.35  |  |  |
| 161. | A block of mass 19 M is suspended by a string of length 1m. A bullet of mass M hits it and gets embedded in it. If the block completes the vertical circle the velocity of bullet in m/s is |  |   |   |  |  |
|      | (A)   | 140  | (B)                                     | $20\sqrt{19.6}$                             |  |  |
|      | (C)   | $20\sqrt{9.8}$   | (D)                                     | 20  |  |  |
| 162. | A rut<br>impa   | ober ball falls from a height of 4m and roct is  | ebounds to 1                            | .5m. The % loss of energy during the        |  |  |
|      | (Â)   | 20   | (B)                                     | 62.5  |  |  |
|      | (C)   | 23   | (D)                                     | 60  |  |  |
| 163. | 25 kg<br>requi  | ; of sand is deposited each second on a c<br>red to maintain the belt in motion is   | conveyor bel                            | It moving at 10m/s. The extra power         |  |  |
|      | (A)   | 2600W  | (B)                                     | 250W  |  |  |
|      | (C)   | 325W   | (D)                                     | 2500W                                       |  |  |
| 164. | A uni<br>slippi   | A uniform rod of mass M and length L standing vertically on a horizontal floor falls without slipping at the bottom. The moment of inertia will be |   |   |  |  |
|      | (A)   | $ML^2/3$   | (B)                                     | $ML^2/6$                                    |  |  |
|      | (C)   | ML <sup>-</sup> /9   | (D)                                     | ML <sup>2</sup> /12                         |  |  |
| 165. | If the (A)  | velocity of C.M of a rolling body is V, $\sqrt{2}$ V   | then velocit<br>(B)                     | y of highest point in the body will be<br>V |  |  |
|      | (C)   | 2V   | (D)                                     | $V/\sqrt{2}$                                |  |  |
| 166. | The a   | ingular momentum of two rotating bodic   | es are equal.                           | If the ratio of their M.I is 1:4, the ratio |  |  |
|      | (A)   | 1:2  | (B)                                     | 2:1   |  |  |
|      | (C)   | 1:4  | (D)                                     | 4:1   |  |  |
| 167. | The level of water in a tank is 5m. A hole 1 cm <sup>2</sup> is made at the bottom. The rate of leakage in m <sup>3</sup> /s is (take $g = 10 \text{ m/s/s}$ )                              |  |   |   |  |  |
|      | (A)   | 10-3   | (B)                                     | 10 <sup>-4</sup>                            |  |  |
|      | (C)   | 10   | (D)                                     | 10 <sup>-2</sup>                            |  |  |
| 168. | Two<br>3/5 <sup>th</sup>  | blocks A and B float in water. A floats of its volume immersed. The ratio of the   | with 1/4 <sup>th</sup> of eir densities | its volume immersed and B floats with is    |  |  |
|      | (A)   | 5:12   | (B)                                     | 12:5  |  |  |
|      | (C)   | 3:20   | (D)                                     | 20:3  |  |  |
| 169. | The terminal velocity of a spherical ball of lead of radius R is V while falling through a viscous liquid varies with R such that   |  |   |   |  |  |
|      | (A)   | V/R is constant  | (B)                                     | VR is constant                              |  |  |
|      | (C)   | V is constant  | (D)                                     | $V/R^2$ is constant                         |  |  |
| 107. | (A)<br>(C)  | l varies with R such that<br>V/R is constant<br>V is constant  | (B)<br>(D)                              | VR is constant $V/R^2$ is constant          |  |  |
| 170.  | A hydraulic press uses a piston of $100 \text{ cm}^2 \text{t}$<br>other piston that supports a mass of $2000 \text{ kg}$<br>(A) $100 \text{ cm}^2$<br>(C) $2 \times 10^4 \text{ cm}^2$   | o exert a force of $10^7$ dynes on water. The area of the<br>g is (take g = 10m/s/s)<br>(B) $10^9$ cm <sup>2</sup><br>(D) $2 \times 10^{10}$ cm <sup>2</sup> |  |  |  |  |  |
|-------|--|--|--|--|--|--|--|
| 171.  | When kerosene and coconut oil of co eff. of viscosity 0.002 and 0.0154 Ns/m <sup>2</sup> are allowed through the same pipe, under same pressure difference and same time collects 1 lit of coconut oil. The volume of kerosene that flows is $(A) = 5.5 \text{ lit}$ |  |  |  |  |  |  |
|       | (C) 7.7 lit  | (D) 8.8 lit  |  |  |  |  |  |
| 172.  | <ul><li>There is a circular hole in metal plate. Whe</li><li>(A) increased</li><li>(C) unchanged</li></ul>   | <ul> <li>n the plate is heated the radius of the hole becomes</li> <li>(B) decreased</li> <li>(D) depends on metal</li> </ul>                                |  |  |  |  |  |
| 173.  | Specific heat of a substance depends on 1.1<br>given to substance<br>(A) Only 1 is correct   | <ul><li>Nature of substance. 2. Mass of substance. 3. Heat</li><li>(B) Both 1 and 2 are correct</li><li>(D) Only 1 and 2 are correct</li></ul>               |  |  |  |  |  |
| 1 7 4 | (C) All are correct  | (D) Only I and 3 are correct   |  |  |  |  |  |
| 174.  | <ul> <li>In a give process dW=0, dq is &lt;0 then for a</li> <li>(A) Temperature increases</li> <li>(C) Pressure increases</li> </ul>  | gas<br>(B) Volume decreases<br>(D) Pressure decreases  |  |  |  |  |  |
| 175.  | <ul><li>The efficiency of carnot engine depends on</li><li>(A) Working substance</li><li>(C) Source temperature</li></ul>  | <ul><li>(B) Sink temperature</li><li>(D) Both B and C</li></ul>  |  |  |  |  |  |
| 176.  | A 200 turn coil of self inductance 30 mH ca<br>with each turn of coil.   | arries a current of 5 mA. Find the magnetic flux linked  |  |  |  |  |  |
|       | (A) $7.5 \times 10^{-7} \text{Wb}$<br>(C) $3 \times 10^{-7} \text{Wb}$   | (B) $1.6 \times 10^{-7}$ Wb<br>(D) $1.5 \times 10^{-7}$ Wb   |  |  |  |  |  |
| 177.  | The instantaneous value of current in an AG  | C circuit is I = 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first   |  |  |  |  |  |
|       | (A) $1/100 \text{ s}$  | (B) 1/200 s  |  |  |  |  |  |
|       | (C) $1/500 \text{ s}$  | (D) 1 s  |  |  |  |  |  |
| 178.  | What in electric system represents force in $(A)$ I  | mechanical system ?  |  |  |  |  |  |
|       | (C) $1/C$  | $\begin{array}{c} (D) & 1 \\ (D) & q \end{array}$  |  |  |  |  |  |
| 179.  | A capacitor of 1 $\mu$ F is charged with 0.01C o<br>(A) 30J<br>(C) 50J   | of electricity. How much energy is stored in it?<br>(B) 40J<br>(D) 60J   |  |  |  |  |  |
| 180.  | An electromagnetic wave is travelling in va<br>a medium having relative electric and magn<br>(A) $3/\sqrt{2} \times 10^8$ m/s  | cuum with a speed of 3 x $10^8$ m/s. Find the velocity in<br>netic permeability 2 and 1, respectively.<br>(B) $1.5 \times 10^8$ m/s                          |  |  |  |  |  |
|       | (C) $2 \times 10^8 \text{m/s}$   | (D) No change  |  |  |  |  |  |

181. Trace the path of a ray of light passing through a glass prism as shown in the figure. If the refractive index of glass is  $\sqrt{3}$ , find out the value of angle of emergence from prism.



- 189. The number of silicon atoms per m<sup>3</sup> is 5 x 10<sup>28</sup>. This is doped simultaneously with 5 x 10<sup>22</sup> atoms per m<sup>3</sup> of arsenic and 5 x 10<sup>20</sup> atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ . (A)  $4.54 \times 10^9 \text{m}^{-3}$  (B)  $4.95 \times 10^{22} \text{m}^{-3}$ 
  - (C)  $1.5 \times 10^{16} \text{m}^{-3}$  (D)  $5 \times 10^{28} \text{m}^{-3}$
- 190. Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre on the positive charge side along the axial line.
- 191. If the Gaussian surface is so chosen that there are some charges inside and some outside then the electric field is due to
  - (A) Only inside charges

(B) Only outside charges

(C) All the charges

- (D) Cannot determine
- 192. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



193. Net capacitance of 3 identical capacitor in series is  $1\mu F$ . What is the net capacitance in  $\mu F$  if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

- 194. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.
  - (A) 2s (B) 1s (C) 0.5s (D) 0.25s
- 195. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be
  - (A) 0.5 (B) 1 (C) 2 (D) 3



196.

| Sr.<br>No | Question  |  |                                 |  |
|-----------|---|--|---------------------------------|--|
| 1.        | If the letters<br>out as in die<br>(A) 601<br>(C) 603   | s of the word SACHIN are arranged in a ctionary, then the word SACHIN appear                             | ll pos<br>s at se<br>(B)<br>(D) | sible ways and these words are written<br>erial number<br>600<br>602                           |
| 2.        | The number remain emption $(A) = 5$<br>(C) = 3 <sup>8</sup>   | r of ways of distributing 8 identical balls  | (B)<br>(D)                      | distinct boxes so that none of the boxes<br>$^{21}_{^{8}C_{2}}$                                |
| 3.        | The numbe<br>appear adja<br>(A) 40<br>(C) 80  | r of arrangements of the letters of the wo<br>cently is  | (B)<br>(B)<br>(D)               | ANANA in which the two N's do not<br>60<br>100   |
| 4.        | Number of<br>(A) 4<br>(C) 10  | divisors of the form $4n+2$ (n $\geq 0$ ) of the in  | nteger<br>(B)<br>(D)            | 240 is<br>8<br>3   |
| 5.        | 6 men and 4<br>ways they c  | 4 women are to be seated in a row so that<br>can be seated is  | t no t                          | wo women sit together. The number of   |
|           | (A) 6048<br>(C) 1209  | 800<br>960   | (B)<br>(D)                      | 17280<br>518400  |
| 6.        | If the cube   | roots of unity are $1, \omega, \omega^3$ , then the roots  | of the                          | e equation $(x-1)^3 + 8 = 0$ are   |
|           | (A) -1, -<br>(C) -1, 1  | $1 + 2 \omega, -1 - 2 \omega^{2}$<br>-2 $\omega, 1-2 \omega^{2}$   | (B)<br>(D)                      | -1, -1, -1<br>-1, 1+2 $\omega$ , 1+2 $\omega^2$  |
| 7.        | If $z_1$ and $z_2$<br>( $z_2$ ) is equal<br>(A) $\pi$   | are two non-zero complex numbers such<br>l to  | (B)                             | $ z_1 + z_2  =  z_1  +  z_2 $ , then arg $(z_1)$ – arg<br>$\pi$                                |
| 0         | $(\mathbf{R})  \frac{1}{2}  (\mathbf{C})  0 0 0$  |  | (D)                             | $\frac{1}{2}$  |
| 8.        | If arg (z) <<br>(A) $\pi$<br>(C) $-\pi/2$   | 0, then $\arg(-z) - \arg(z) =$   | (B)<br>(D)                      | $-\pi$<br>$\pi/2$  |
| 9.        | If ω is an in           (A)         128           (C)         128   | maginary cube root of unity, then $(1+\omega-\omega)^2$  | $(B)^{(2)}$ (B)<br>(D)          | uals<br>-128 ω<br>-128 ω <sup>2</sup>  |
| 10.       | The points $z_{and}$ only if (A) $z_1 + z_2$  | z1, z2, z3, z4 in the complex plane are the z4 = z2+ z3  | ne ver<br>(B)                   | tices of a parallelogram taken in order if<br>z1 + z3 = z2 + z4                                |
|           | (C) z1 +  | $z_2 = z_3 + z_4$  | (D)                             | None of these  |
| 11.       | Let $R = \{(3 \\ 12\}$ . The re<br>(A) Refl<br>(C) An effective of the second sec | ,3) (6,6) (9,9) (12,12), (6,12) (3,9) (3,12<br>lation is<br>exive and transitive<br>equivalence relation | ), (3,6<br>(B)<br>(D)           | 5)} be in a relation on the set A= {3, 6, 9,<br>Reflexive only<br>Reflexive and symmetric only |

| 12.                     | If a real valued function $f(x)$ satisfies the functional equation $f(x-y) = f(x) f(y) - f(a-x) f(a+x)$ , where 'a' is a given constant and $f(0) = 1$ , then $f(2a, x)$ is equal to  |   |  |  |
|-------------------------|---|---|--|--|
|                         | (a+y), where a is a given constant and $f(0) = 1$ , in<br>(A) $-f(x)$   | (B) = f(x)  |  |  |
|                         | (C) $f(x) + f(a-x)$   | (D) $f(-x)$   |  |  |
| 13.                     | If the graph of the function $f(x)$ is symmetrical about the graph of the function $f(x)$ is symmetrical about the fun | but the line $x=2$ , then   |  |  |
|                         | (A) $f(x+2) = f(x-2)$   | (B) $f(2+x) = f(2-x)$   |  |  |
|                         | (C) $f(x) = f(-x)$  | (D) $f(x) = -f(-x)$   |  |  |
| 14.                     | The function $f: R \rightarrow R$ defined by $f(x) = \sin x$ is   |   |  |  |
|                         | (A) into  | (B) onto  |  |  |
|                         | (C) one-one   | (D) many-one  |  |  |
| 15.                     | In a college of 300 students, every student reads 5 students. The number of newspapers is   | newspapers and every newspaper is read by 60  |  |  |
|                         | (A) At least 30   | (B) At most 20  |  |  |
|                         | (C) Exactly 25  | (D) None of these   |  |  |
| 16.                     | The value of a for which the sum of the squares of assume the least value is  | the roots of the equation $x^2 - (a - 2) x - a - 1 = 0$   |  |  |
|                         | (A) 1   | (B) 0   |  |  |
|                         | (C) 3   | (D) 2   |  |  |
| 17.                     | If the roots of the equation $x^2 - bx + c = 0$ be two c  | onsecutive integers, then $b^2 - 4c$ equals   |  |  |
|                         | (A) - 2   | (B) 3<br>(D) 1  |  |  |
|                         | (C) 2   | (D) I   |  |  |
| 18.                     | If (1-p) is a root of quadratic equation $x^2 + px + (1 - (A)) = 0$   | (D) = 0, then the roots are   |  |  |
|                         | (A) $0, 1$<br>(C) $0, -1$   | (B) $-1, 1$<br>(D) $-1, 2$  |  |  |
| 10                      | The number of real solutions of the equation $x^2$ (1)  | (b) 1, 2<br>$x_1 + 2 = 0$ is/ara  |  |  |
| 19.                     | (A) 2   | (B) = 4   |  |  |
|                         | (C) 1   | (D) 3   |  |  |
| 20.                     | If $x^2 + 2ax + 10 - 3a > 0$ for every real value of x. t   | then  |  |  |
|                         | (A) $a > 5$   | (B) $a < -5$  |  |  |
|                         | (C) $-5 < a < 2$  | (D) $2 < a < 5$   |  |  |
| 21.                     | The angle between two diagonals of a cube is  |   |  |  |
|                         | (A) $45^{\circ}$  | (B) $60^{\circ}$  |  |  |
|                         | (C) $90^{\circ}$  | (D) $\tan^{-1}2\sqrt{2}$  |  |  |
| 22.                     | If the angle between two vectors $\vec{i} + \vec{k}$ and $\vec{i} - \vec{i} + \vec{k}$  | - $a\vec{k}$ is $\pi/3$ , then the value of a is  |  |  |
|                         | (A) 2   | (B) 4   |  |  |
|                         | (C) -2  | (D) 0   |  |  |
| 23.                     | The scalar $\vec{A} \cdot (\vec{B} + \vec{C}) \times (\vec{A} + \vec{B} + \vec{C})$ equals  |   |  |  |
|                         | (A) 0   | (B) $\begin{bmatrix} \vec{A} \ \vec{B} \ \vec{C} \end{bmatrix} + \begin{bmatrix} \vec{B} \ \vec{C} \ \vec{A} \end{bmatrix}$ |  |  |
|                         | (C) $\begin{bmatrix} \vec{A} \ \vec{B} \ \vec{C} \end{bmatrix}$   | (D) None of these   |  |  |
| 24                      | The points with position vectors $60^\circ \pm 2^\circ 40^\circ = 9$  | $\hat{a}_{i} = 52\hat{i}_{i}$ are collinear if  |  |  |
| <i>∠</i> <del>1</del> . | (A) $a = -40$   | (B) $a=40$  |  |  |
|                         | (C) $a=20$  | (D) None of these   |  |  |
|                         |   |   |  |  |

| 25. | <ul><li>The number of vectors of unit length perpendicular</li><li>(A) one</li><li>(C) three</li></ul>  | r to vectors $\vec{a} = (0 \ 1, \ 1)$ and $\vec{b} = (1 \ 1, \ 0)$ is<br>(B) two<br>(D) infinite      |
|-----|---|---|
| 26. | The angle between the lines $2x = 3y = -z$ and $6x = (A) = 0^{\circ}$<br>(C) $45^{\circ}$   | = -y = -4z is<br>(B) 90°<br>(D) 30°   |
| 27. | Distance between two parallel planes $2x + y + 2z =$<br>(A) $3/2$<br>(C) $7/2$  | = 8 and $4x + 2y + 4z + 5 = 0$ is<br>(B) $5/2$<br>(D) $9/2$   |
| 28. | <ul><li>The method of least squares dictates that we choos of deviations of the points from the line is:</li><li>(A) Maximum</li><li>(C) Zero</li></ul> | <ul><li>(B) Minimum</li><li>(D) Positive</li></ul>  |
| 29. | If the value of any regression coefficient is zero, th<br>(A) Qualitative<br>(C) Dependent  | nen two variables are:<br>(B) Correlated<br>(D) Independent   |
| 30. | <ul><li>A process by which we estimate the value of dependent variables is called:</li><li>(A) Correlation</li><li>(C) Residual</li></ul>               | <ul><li>ndent variable on the basis of one or more</li><li>(B) Regression</li><li>(D) Slope</li></ul> |
| 31. | If $A = \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$ , then $A^3 =$<br>(A) A<br>(C) 3A  | <ul><li>(B) 2A</li><li>(D) 4A</li></ul>   |
| 32. | The value of $\begin{vmatrix} 1+x & 1 & 1\\ 1 & 1+y & 1\\ 1 & 1 & 1+z \end{vmatrix}$ is equal to<br>(A) $1+x+y+z$<br>(C) $xyz$                          | <ul><li>(B) x+y+z</li><li>(D) xyz+xy+xz+yz</li></ul>  |
| 33. | If $A^2 - A + I = 0$ , then the inverse of A is<br>(A) A<br>(C) I-A   | (B) A–I<br>(D) I  |
| 34. | The number of bijective functions from a set A to i<br>(A) 106<br>(C) 106 !   | itself when A contains 106 elements is<br>(B) $106^{3}$<br>(D) $2^{106}$                              |
| 35. | The value of $\begin{vmatrix} 11 & 12 & 13 \\ 12 & 13 & 14 \\ 13 & 14 & 15 \end{vmatrix}$ is<br>(A) 1<br>(C) -1   | (B) 0<br>(D) 67   |
| 36. | The mean deviation of the data 3, 10, 10, 4, 7, 10, 5<br>(A) 2<br>(C) 3   | 5 from the mean is<br>(B) 2.57<br>(D) 3.75  |

| 37. | The sta<br>(A)           | and and deviation of the data 6, 5, 9, 13, 12, 8, $\sqrt{\frac{52}{7}}$                             | 10 is<br>(B)            | <u>52</u><br>7  |
|-----|--------------------------|---|-------------------------|---|
|     | (C)                      | $\sqrt{6}$  | (D)                     | 6   |
| 38. | Let a, of the            | b, c, d, e be the observations with mean m and observations a+k, b+k, c+k, d+k, e+k is              | d stan                  | dard deviation s. The standard deviation                      |
|     | (A)<br>(C)               | ks<br>s+k   | (B)<br>(D)              | s<br>s/k  |
| 39. | Coeffi<br>25, res<br>(A) | cients of variation of two distributions are 50 spectively. Difference of their standard deviat 2.5 | and 6<br>ions is<br>(B) | 50, and their arithmetic means are 30 and<br>s                |
|     | (C)                      | 1.5   | (D)                     | 0   |
| 40. | Consid<br>numbe          | der the first 10 positive integers. If we multipler, the variance of the numbers so obtained is     | ly eac                  | h number by -1 and then add 1 to each                         |
|     | (A)                      | 8.25  | (B)                     | 6.50<br>2.87  |
| 4.1 | (C)                      | 5.67  | (D)                     |   |
| 41. | For a $(A)$              | Feasible solutions  | equati<br>(B)           | Disposed solutions  |
|     | (C)                      | Profit solutions  | (D)                     | Loss solutions  |
| 42. | Infeasi<br>all con       | ibility means that the number of solutions to t<br>astraints is                                     | he lin                  | ear programming models that satisfies                         |
|     | (A)                      | at least 1  | (B)                     | 0   |
|     | (C)                      | An infinite number  | (D)                     | At least 2  |
| 43. | A cons                   | straint that does not affect the feasible region  | is a                    |   |
|     | (A)                      | Non-negativity constraint   | (B)                     | Redundant constraint  |
|     | (C)                      | Standard constraint   | (D)                     | Slack constraint  |
| 44. | Consid<br>0 The          | der the following LPP. Maximize $3x_1 + 8x_2$ su optimal value of the function is                   | ıbject                  | to $2x_1 + 5x_2 \le 10$ , $6x_1 + x_2 \le 6$ , $x_1, x_2 \ge$ |
|     | (A)                      | 0   | (B)                     | 3   |
|     | (C)                      | <u>111</u>  | (D)                     | 16  |
| 4.5 | <b>Б</b> 1'              | 7   | 1                       | ··· • 1 ···· 1  |
| 45. | For $\lim_{(A)}$         | Concave set   | equal:<br>(B)           | Ities is classified as  |
|     | (C)                      | Loss set  | (D)                     | Profit set  |
| 46. | Which                    | of the following is unary operations?   |                         |   |
|     | (A)                      | Addition  | (B)                     | Multiplication  |
|     | (C)                      | Square root   | (D)                     | None of these   |
| 47. | If * is                  | a binary operation in A then  |                         |   |
|     | (A)                      | A is closed under *   | (B)                     | A is not closed under *                                       |
|     | (C)                      | A is not closed under +   | (D)                     | A is closed under –   |

| 48. | Which of the following statements is not correct ?<br>(A) $Log_{10} \ 10 = 1$<br>(C) $Log_{10} \ 1 = 0$   | (B)<br>(D)                                 | Log $(2+3) = \log (2 \times 3)$<br>Log $(1+2+3) = \log 1 + \log 2 + \log 3$  |
|-----|---|--|--|
| 49. | If $\log (a/b) + \log (b/a) = \log (a+b)$ , then<br>(A) $a+b=1$<br>(C) $a=b$  | (B)<br>(D)                                 | a-b=1<br>$a^2-b^2=1$   |
| 50. | The value of e is<br>(A) 0<br>(C) 2.718   | (B)<br>(D)                                 | 1<br>2.14  |
| 51. | 1+ sin x + sin <sup>2</sup> x + up to $\infty = 4 + 2\sqrt{3}, 0 < x < \Pi$<br>(A) $\frac{\pi}{6}, \frac{\pi}{3}$<br>(C) $2\frac{\pi}{3}, \frac{\pi}{6}$            | [ and x<br>(B)<br>(D)                      | $x \neq \frac{\pi}{2} \text{ then } x = \frac{\pi}{3}, 5\frac{\pi}{6}$ $\frac{\pi}{3}, 2\frac{\pi}{3}$             |
| 52. | <ul> <li>A cow is tied to a post by a rope. The cow moves a tight. If it describes 44 meters, when it has traced of (A) 35 meters</li> <li>(C) 56 meters</li> </ul> | along<br>out 72 <sup>6</sup><br>(B)<br>(D) | the circular path always keeping the rope<br>of at the centre, the length of the rope is<br>22 meters<br>45 meters |
| 53. | $If f(x) = \int_{-1}^{x}  t   dt, for any  x \ge 0, f(x) =$ (A) $\frac{1}{2}(1-x^2)$ (C) $\frac{1}{2}(1+x^2)$   | (B)<br>(D)                                 | $1 - x^2$ $1 + x^2$  |
| 54. | The total of number of terms in the expansion of (x<br>(A) 50<br>(C) 202  | (B) (B) (D)                                | $x^{100} + (x-y)^{100}$ after simplification is<br>51<br>100   |
| 55. | The maximum value of $\frac{\log x}{x}$ in $(2, \infty)$ is<br>(A) 1<br>(C) e   | (B)<br>(D)                                 | $\frac{2}{e}$<br>$\frac{1}{e}$   |
| 56. | The series $\frac{1}{2 \cdot 5} + \frac{1}{5 \cdot 8} + \frac{1}{8 \cdot 11} + \dots \dots up \text{ to } n$<br>(A) $\frac{n}{4n+6}$<br>(C) $\frac{n}{6n+4}$        | terms<br>(B)<br>(D)                        | s is equal to<br>$ \frac{\frac{1}{6n+4}}{\frac{3n+7}{3n+7}} $  |
| 57. | $\lim_{\substack{x \to 1 \\ (A)}} \frac{\tan(x^2 - 1)}{x - 1} equals$ (C) -2  | (B)<br>(D)                                 | $\frac{\frac{1}{2}}{-\frac{1}{2}}$   |

58. If x<sup>m</sup>y<sup>n</sup> = (x + y)<sup>m+n</sup> then 
$$\frac{dy}{dx}$$
 is equal to
(A)  $\frac{x + y}{xy}$  (B) xy
(C) 0 (D)  $\frac{y}{x}$ 
59. If y = e<sup>sin<sup>-1</sup>(t<sup>2</sup>-1)</sup> and x = e<sup>sec<sup>-1</sup>(\frac{1}{t<sup>2</sup>-1}) then  $\frac{dy}{dx}$  is equal to
(A)  $\frac{x}{y}$  (B)  $-\frac{y}{x}$ 
60. Find the sum of 1<sup>st</sup> n terms of the series  $\frac{1^2}{1} + \frac{1^2 + 2^2}{1 + 2} + \frac{1^2 + 2^2 + 3^2}{1 + 2 + 3} + \dots$ 
(A)  $\frac{n+2}{3}$  (B)  $\frac{n(n+2)}{3}$ 
(C)  $\frac{n(n-2)}{3}$  (D)  $\frac{n(n-2)}{6}$ 
61. The value of tan  $\frac{\pi}{8}$  is equal to
(A)  $\frac{1}{2}$  (B)  $\sqrt{2} + 1$ 
(C)  $\frac{1}{\sqrt{2} + 1}$  (D)  $1 - \sqrt{2}$ 
62. The solution for the differential equation  $\frac{dy}{y} + \frac{dx}{x} = 0$  is
(A)  $\frac{1}{y} + \frac{1}{x} = c$  (B) log x. log y = c
(C) xy = c
(D) x + y = c
63. If PA. =  $\frac{1}{3}$ , PB. =  $\frac{1}{4}$ , P(A ∪ B) =  $\frac{5}{12}$ , then P(A / B) =
(A)  $\frac{25}{16}$  (D)  $\frac{2}{3}$ 
64. If (a - 2)x<sup>2</sup> + 9y<sup>2</sup> = 4 represents rectangular hyperbola then a equals
(A)  $0$  (B) 2
(C) 9
(D) None of these
65. If  $\sum_{n=55$ , then the value of  $\sum_{n^2} n^2$  is equal to
(A) 385
(C) 1115
(D) 3025</sup>

| 66. | 6. The 11 <sup>th</sup> term in expansion of $\left(x + \frac{1}{\sqrt{x}}\right)^{14}$ is |  |                     |  |  |
|-----|--|--|---------------------|--|--|
|     | (A)  | 999  | (B)                 | 1001   |  |
|     | (C)  | x<br>1   | (D)                 | $\frac{\frac{x}{x}}{1001}$   |  |
| 67. | $\int_0^{\frac{\pi}{2}} \frac{1}{si}$  | $\frac{\sin^{1000}x  dx}{\sin^{1000}x + \cos^{1000}x} \text{ is equal to}$   |                     |  |  |
|     | (A)<br>(C)   | $\frac{1000}{\pi}$   | (B)<br>(D)          | $\frac{1}{\pi}{4}$   |  |
| 68. | $f e^x$ :<br>(A)   | $x^{5} dx is$ $e^{x}[x^{5} + 5x^{4} + 20x^{3} + 60x^{2} + 120x + 120] + C$ $e^{x}[x^{5} - 5x^{4} + 20x^{3} - 60x^{2} + 120x - 120] + C$  | (B)<br>(D)          | $e^{x}[x^{5} - 5x^{4} - 20x^{3} - 60x^{2} - 120x - 120] + C$<br>$e^{x}[x^{5} + 5x^{4} + 20x^{3} - 60x^{2} - 120x + 120] + C$ |  |
| 69. | $\int \frac{1}{\sec \alpha}$   | $\frac{\sec x}{\exp(x)} = \frac{1}{2} \frac{1}{\exp(x)} \frac{1}{\exp(x$ | (D)                 |  |  |
|     | (A)<br>(C)   | $\tan x - \sec x + C.$ $\sec x + \tan x + C.$  | (B)<br>(D)          | $\log (1 + \sec x) + C.$ $\log \sin x + \log \cos x + C.$  |  |
| 70. | If f(A)  | $x) + be^{ax} + ae^{bx}, then f''(0) = 0$  | (B)                 | 2ab  |  |
| 71. | (C)<br>The l   | ab(a + b)<br>enath of the latus rectum of the narabo   | (D)                 | $ab^{2} + 3x + 3y + 1 = 0$ is  |  |
|     | (A)  | $\frac{4}{-}$  | (B)                 | 7  |  |
|     | (C)  | 3<br>12  | (D)                 | $\frac{3}{4}$  |  |
| 72. | The p  | principal value of $\sin^{-1} \tan\left(-\frac{5\pi}{4}\right)$ is   |                     |  |  |
|     | (A)  | $\frac{\pi}{4}$  | (B)                 | $-\frac{\pi}{4}$   |  |
|     | (C)  | $\frac{4}{\pi}$  | (D)                 | $-\frac{4\pi}{2}$  |  |
| 73. | If y :   | $= e^{m \sin^{-1}x}$ , then $\frac{d^2y}{dx^2}$ at $x = 0$ is  |                     |  |  |
|     | (A)<br>(C)   | m<br>$-m^2$  | (B)<br>(D)          | m <sup>2</sup><br>2m   |  |
| 74. | If y :<br>(A)<br>(C)   | $= \sin(2 \sin^{-1}x), then it satisfies the diff(1 - x2)y2 - xy1 + 4y = 0.(1 - x2)y2 - xy1 + y = 0.$  | erent<br>(B)<br>(D) | ial equation<br>$(1 + x^2)y_2 - xy_1 + 4y = 0.$<br>$(1 + x^2)y_2 - xy_1 + 4y = 0.$   |  |
| 75. | The 1  | value of $\cos\left[2\tan^{-1}\frac{1+x}{1-x} + \sin^{-1}\frac{1-x^2}{1+x^2}\right]$   | is                  |  |  |
|     | (A)  | $\sqrt{2}$   | (B)                 | 1  |  |
|     | (C)  | 0  | (D)                 | -1   |  |

| 76.        | The equation of the circle which touches the x-axis and whose centre is (1,2), is |   |                     |  |  |  |  |
|------------|---|---|---------------------|--|--|--|--|
|            | (A)   | $x^2 + y^2 - 2x + 4y + 1 = 0.$  | (B)                 | $x^2 + y^2 - 2x - 4y + 1 = 0.$   |  |  |  |
|            | (C)   | $x^2 + y^2 + 2x + 4y + 1 = 0.$  | (D)                 | $x^2 + y^2 + 4x + 2y + 1 = 0.$   |  |  |  |
| 77.        | The d   | if ferential equation $y \frac{dy}{dx} + x = c$ repres                              | ents                |  |  |  |  |
|            | (A)   | A family of hyperbolas  | (B)                 | A family of circles whose centres are on the y-axis.                   |  |  |  |
|            | (C)   | A family of parabolas   | (D)                 | A family of circles whose centres are on the x-axis.                   |  |  |  |
| 78.        | A stor  | he is thrown vertically upwards and the height                                      | t x ft r            | eached by the stone in t seconds is given                              |  |  |  |
|            | by, x+  | $80t - 16t^2$ . The stone reaches the maximum                                       | height              | in   |  |  |  |
|            | (A)   | 2s  | (B)                 | 2.5s   |  |  |  |
|            | (C)   | 38  | (D)                 | 1.58   |  |  |  |
| 79.        | The a   | rea of the region bounded by $y = 2x - x$   | $c^2$ and           | l the x – axis is  |  |  |  |
|            | (A)   | $\frac{8}{2}$ sq. units   | (B)                 | $\frac{4}{2}$ sq. units  |  |  |  |
|            | $(\mathbf{C})$  | 3 -<br>7  | (D)                 | 2  |  |  |  |
|            | (0)   | $\frac{1}{3}$ sq. units   | (D)                 | $\frac{1}{3}$ sq. units  |  |  |  |
| 80.        | 166(  | (2a-x, -a < x < a) the marked   | 641.                |  |  |  |  |
|            | <i>IJ J</i> (.  | $a \le x$ then which $a \le x$  | n of th             | e following is true  |  |  |  |
|            | (A)   | f(x) is discontinuous at $x = a$ .  | (B)                 | f(x) is not differentiable at $x = a$ .                                |  |  |  |
|            | (C)   | $f(x)$ is differentiable at $x \ge a$ .   | (D)                 | f(x) is continuous at all $x < a$ .                                    |  |  |  |
| 81.        | A die   | is tossed thrice. If getting an even number is                                      | consid              | ered as success, the variance of the                                   |  |  |  |
|            | $(\Lambda)$   | 3   | ( <b>B</b> )        | 1  |  |  |  |
|            | (A)   | $\frac{3}{4}$   | (D)                 | $\frac{1}{2}$  |  |  |  |
|            | (C)   | 1   | (D)                 | 2  |  |  |  |
|            |   | $\overline{4}$  |                     | 3  |  |  |  |
| 82.        | The co  | ordinates of the foot of the perpendicular drawn f                                  | rom the             | e point $(3,4)$ on the line $2x + y - 7 = 0$ is                        |  |  |  |
|            | (A)   | $\left(\frac{9}{7},\frac{17}{7}\right)$   | (B)                 | (1, 5)   |  |  |  |
|            | $(\mathbf{C})$  | (5' 5)<br>(-5 1)  | (D)                 | (1 - 5)  |  |  |  |
| 02         | (C)<br>The m  | (-3, 1)   | (D)                 | (1, 3)   |  |  |  |
| 83.        | (A)   | $x^2 + y^2 - 8x = 0$  | (B)                 | $x^2 + y^2 - 5x + 7y = 0$  |  |  |  |
|            | $(\mathbf{C})$  | $x^{2} + y^{2} - 5x + 7y - 1 = 0$   | (D)                 | $x^{2} + y^{2} - 8x + 7y - 2 = 0$                                      |  |  |  |
| 84         | If ton  | $15^\circ = 2$ $\sqrt{3}$ then 2 tan $1095^\circ + \cot 975^\circ + \tan 975^\circ$ | m ( 10              | $O_{2}^{o} =$  |  |  |  |
| 0          | $(\Delta)$  | $13 - 2 - \sqrt{3}$ , then 2 tan 1075 + cot 775 + ta                                | (R)                 |  |  |  |  |
|            | $(\mathbf{C})$  | $2 + \sqrt{3}$  | $(\mathbf{D})$      | $4 + 2\sqrt{3}$  |  |  |  |
| - <b>-</b> | (0)   | $4 - 2\sqrt{3}$   | (D)                 | $2 - \sqrt{3}$   |  |  |  |
| 85.        | The nu  | umber of circles touching the lines $x = 0$ , $y = 0$                               | a and               | y = b is   |  |  |  |
|            | (A)   | Four  | (Б)<br>(D)          | 1 wo<br>Infinite   |  |  |  |
| 97         | (0)   | 1001  | (D)                 | 1  |  |  |  |
| 00.        | The or  | rder and degree of the differential equation  | $1 + (\frac{d}{d})$ | $\left[\frac{d^2y}{dt}\right]^5 = \frac{d^2y}{dt^2}$ are respectively, |  |  |  |
|            | (A)   | 15  | $(\mathbf{B})$      | 2 1  |  |  |  |
|            | (C)   | 2,5   | (D)                 | 2,3  |  |  |  |
|            | . /   |   |                     |  |  |  |  |

| 87. | $x^{2n} - x^{2n}$     | y <sup>2n</sup> is divisible by  | <b>(D)</b>       |  |
|-----|-----------------------|--|------------------|--|
|     | (A) $(C)$             | $\begin{array}{c} x - y \\ x + y \end{array}$  | (B)<br>(D)       | y - x<br>None of these   |
| 88. | Mr. X<br>attend       | Thas a 75% chance of attending the annual me<br>ls. Otherwise she has a 50% chance of attendi<br>the probability that Mr. X is also there is | eet. M<br>ng. If | iss Y has an 80% chance, if Mr. X also<br>I go to the meet and see Miss Y there, |
|     | (A)                   | $\frac{24}{20}$  | (B)              | $\frac{25}{22}$  |
|     | (C)                   | $\frac{29}{26}$  | (D)              | $\frac{29}{27}$  |
| 89. | $\int_{-}^{3}$        | $\sqrt{4-x}$ dx  |                  |  |
|     | $J_1 \sqrt{2}$<br>(A) | $\overline{x} + \sqrt{4-x}$  | (B)              | 1  |
|     | (C)                   | 3  | (D)              | 2  |
| 90. | $\lim \frac{a}{b}$    | $\frac{\sin x - 1}{\sin x - 1}$  |                  |  |
|     | $(A)^{x \to 0} b$     | $\frac{\log a}{\log b}$  | (B)              | $\log\left(\frac{a}{b}\right)$   |
|     | (C)                   | 1  | (D)              | 0  |
| 91. | The v                 | alue of $\frac{C_1}{2} + \frac{C_3}{4} + \frac{C_5}{6} + \dots \dots$ where $C_1, C_3, C_5$  | a                | re the binomial coefficients of order n,   |
|     | is<br>(A)             | $2^{n+1} - 1$  | (B)              | $2^{n} - 1$  |
|     | $(\mathbf{C})$        | $\frac{n+1}{2^{n+1}}$  | (D)              | $\overline{n+1}_{2^{n+1}+1}$   |
|     | (0)                   | $\frac{2}{n+1}$  | (D)              | $\frac{2}{n+1}$  |
| 92. | The v                 | alue of $\binom{n}{r}$ + 2. $\binom{n}{r-1}$ + $\binom{n}{r-2}$ , where  | $\binom{n}{k}$   | denotes the binomial coefficient of order  |
|     | n, is<br>(A)          | $\binom{n}{n}$   | (B)              | $\binom{n+1}{n}$   |
|     | (C)                   | $\binom{n+2}{n+2}$   | (D)              | None of these  |
| 93. | Whic                  | h one of the following is possible?  |                  |  |
|     | (A)                   | $\cos\theta = \frac{7}{3}$   | (B)              | $\sin\theta = \frac{a^2 + b^2}{a^2 - b^2}, (a \neq b)$                           |
|     | (C)                   | $\sec\theta = \frac{4}{5}$   | (D)              | $\tan \theta = 45$   |
| 94. | In the                | expansion of $\left(x^2 - \frac{1}{3x}\right)^9$ the term indep  | enden            | t of x is  |
|     | (A)<br>(C)            | T <sub>7</sub><br>T <sub>8</sub>   | (B)<br>(D)       | T <sub>6</sub><br>T <sub>9</sub>   |
| 95. | If x =                | $=e^{y+e^{y+\dots\infty}}, x>0, then \frac{dy}{dt}$ is   |                  |  |
|     | (A)                   | $\frac{x}{dx}$   | (B)              | 1  |
|     | (C)                   | $ \begin{array}{l} 1+x\\ 1-x \end{array} $   | (D)              | $\frac{1}{x}$<br>1 + x   |
|     | (0)                   | $\overline{x}$   | (2)              | $\overline{x}$   |

| 96.  | $\int e^x \left( \frac{1 + \sin x}{1 + \cos x} \right) dx \text{ is}$  |   |   |
|------|--|---|---|
|      | (A) $\tan\left(\frac{x}{2}\right) + C$   | (B  | ) $e^x \sin x + C$  |
|      | (C) $e^x \tan\left(\frac{x}{2}\right) + C$   | (D  | ) $e^x + C$   |
| 97.  | The function $f(x) = [x]$ , when<br>(A) $-2$<br>(C) 4  | re [x] denotes greatest inte<br>(B<br>(D                            | <ul><li>ger function is continuous at</li><li>1.5</li><li>1</li></ul>                                       |
| 98.  | If the arithmetic mean of two<br>(A) $6 + \sqrt{7} : 6 - \sqrt{7}$<br>(C) $5 + \sqrt{6} : 5 - \sqrt{6}$  | o positive numbers a and b<br>(B<br>(D                              | (a>b) is twice their G.M., then a:b is<br>) $2 + \sqrt{3} : 2 - \sqrt{3}$<br>) None of these                |
| 99.  | $\lim_{x \to 0} x \sin(e^{1/x}) \text{ is equal to}$<br>(A) 0<br>(C) $\frac{e}{2}$   | (B<br>(D  | ) 1<br>) Does not exist   |
| 100. | Differential coefficient of $e^{x}$<br>(A) $e^{x^{2}}$<br>(C) $x^{2}e^{x^{2}}$   | <sup>2</sup> with respect to log x <sup>2</sup><br>(B<br>(D         | is<br>) xe <sup>x<sup>2</sup></sup><br>) 2x <sup>2</sup> e <sup>x<sup>2</sup></sup>                         |
| 101. | <ul><li>While walking on smooth su</li><li>(A) Large friction</li><li>(C) Larger normal force</li></ul>  | rface one should take sma<br>(B<br>(D                               | <ul><li>Il steps to ensure</li><li>Small friction</li><li>Smaller normal force</li></ul>                    |
| 102. | <ul><li>What happens to a vehicle tr<br/>and tires suddenly disappear</li><li>(A) Moves along tangent</li><li>(C) Moves radially out</li></ul> | avelling in an unbanked cu<br>s<br>(B<br>(D                         | <ul> <li>) Moves radially in</li> <li>) Moves along the curve</li> </ul>                                    |
| 103. | A ball of mass 0.2 kg strikes<br>changes from 20m/s to 10m/<br>(A) $2\sqrt{7}$<br>(C) $2\sqrt{5}$  | an obstacle and moves at<br>s the magnitude of impuls<br>(B<br>(D   | 60° to its initial direction. If its speed<br>e received by the ball isNs<br>) $2\sqrt{3}$<br>) $3\sqrt{2}$ |
| 104. | A spacecraft of mass 2000kg<br>of mass 500 kg is stationary.<br>(A) 600<br>(C) 1500  | g moving with 600 m/s suc<br>The velocity of other part<br>(B<br>(D | Idenly explodes into two pieces. One piece<br>in m/s is<br>) 800<br>) 1000                                  |
| 105. | 16 kg 8 kg 4 kg  | g 140 N The   | e force on 16 kg is?  |
|      | (A) 140N<br>(C) 100N   | (B<br>(D  | ) 120N<br>) 80N   |

106. A man of mass 40 kg is at rest between the walls. If co eff. of friction between man and wall is 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)

|      | (A)<br>(C)                  | 100 N<br>80 N                                     |  |   | (B)<br>(D)                             | 250 N<br>50 N  |
|------|-----------------------------|---|--|---|--|--|
| 107. |                             |   |  |   |  |  |
|      |                             | h   |  | D   | )                                      | •  |
|      | Find (A)<br>(C)             | minimur<br>7D/4<br>5D/4                           | n height in term   | s of D to complet   | e the loop<br>(B)<br>(D)               | 9D/4<br>3D/4   |
| 108. | Gravi                       | itational   | force between tw<br>ific gravity 3 Th                    | wo bodies is F. The<br>province of the province of the<br>province of the province of the<br>province of the province o | ne space ar                            | round the mass is now filled with a  |
|      | (A)<br>(C)                  | F/9<br>F  |  |   | (B)<br>(D)                             | 3F<br>F/3  |
| 109. | A ma<br>(A)<br>(C)          | n weighs<br>infinity<br>zero                      | s 75 kg on the su  | irface of earth. Hi   | is weight o<br>(B)<br>(D)              | on the geostationary satellite is<br>150kg<br>75/2 kg  |
| 110. | g at a<br>(A)<br>(C)        | a depth o<br>6.65<br>8.65                         | of 1600 km insid   | e the earth in m/s  | /s is<br>(B)<br>(D)                    | 7.35<br>4.35   |
| 111. | A blo<br>embe<br>(A)<br>(C) | the peck of matching ded in it 140 $20\sqrt{9.8}$ | ass 19 M is susp<br>it. If the block c<br>$\overline{3}$ | ended by a string<br>ompletes the vert  | of length<br>ical circle<br>(B)<br>(D) | 1m. A bullet of mass M hits it and gets<br>the velocity of bullet in m/s is<br>$20\sqrt{19.6}$<br>20 |
| 112. | A rub                       | ber ball  | falls from a heig  | ght of 4m and reb   | ounds to 1                             | .5m. The % loss of energy during the   |
|      | (A)<br>(C)                  | 20<br>23  |  |   | (B)<br>(D)                             | 62.5<br>60   |
| 113. | 25 kg<br>reauii             | of sand<br>red to ma                              | is deposited eac<br>aintain the belt in                  | h second on a con<br>n motion is  | nveyor bel                             | t moving at 10m/s. The extra power   |
|      | (A)<br>(C)                  | 2600W<br>325W                                     | /  |   | (B)<br>(D)                             | 250W<br>2500W  |

| 114. | A uniform rod of mass M and length L standing vertically on a horizontal floor falls without slipping at the bottom. The moment of inertia will be |  |                |  |
|------|--|--|----------------|--|
|      | (A) $ML^{2}/3$<br>(C) $ML^{2}/9$   | (B) $ML^{2}/6$<br>(D) $ML^{2}/12$  |                |  |
| 115. | If the velocity of C.M of a rolling body is $(A) = \sqrt{2} V$   | s V, then velocity of highest point in the body will be $(B) = V$  | e              |  |
|      | $\begin{array}{c} (1) & \sqrt{2} \\ (C) & 2V \end{array}$  | $\begin{array}{c} (D) & V/\sqrt{2} \end{array}$  |                |  |
| 116. | The angular momentum of two rotating of their rotational K.E is  | podies are equal. If the ratio of their M.I is 1:4, the ra   | tio            |  |
|      | (A) 1:2<br>(C) 1:4   | (B) 2:1<br>(D) 4:1   |                |  |
| 117. | The level of water in a tank is 5m. A hole /s is (take $g=10 \text{ m/s/s}$ )  | e 1 $cm^2$ is made at the bottom. The rate of leakage in   | m <sup>3</sup> |  |
|      | $\begin{array}{ll} (A) & 10^{-3} \\ (C) & 10 \end{array}$  | (B) $10^{-4}$<br>(D) $10^{-2}$   |                |  |
| 118. | Two blocks A and B float in water. A flo $3/5^{th}$ of its volume immersed. The ratio of   | bats with 1/4 <sup>th</sup> of its volume immersed and B floats w f their densities is   | rith           |  |
|      | (A) 5:12<br>(C) 3:20   | (B) 12:5<br>(D) 20:3   |                |  |
| 119. | The terminal velocity of a spherical ball liquid varies with R such that   | of lead of radius R is V while falling through a visco   | us             |  |
|      | <ul><li>(A) V/R is constant</li><li>(C) V is constant</li></ul>  | (B) VR is constant<br>(D) $V/R^2$ is constant  |                |  |
| 120. | A hydraulic press uses a piston of 100 cm<br>other piston that supports a mass of 2000<br>(A) $100 \text{ cm}^2$                                   | $n^{2}$ to exert a force of 10 <sup>7</sup> dynes on water. The area of t<br>b kg is (take g = 10m/s/s)<br>(B) 10 <sup>9</sup> cm <sup>2</sup><br>(D) 2 x 10 <sup>10</sup> cm <sup>2</sup> | he             |  |
| 121. | (C) $2 \times 10^{\circ}$ cm <sup>-</sup><br>When kerosene and coconut oil of co eff   | (D) $2 \times 10^{-4} \text{ cm}^{-1}$<br>. of viscosity 0.002 and 0.0154 Ns/m <sup>2</sup> are allowed  |                |  |
|      | through the same pipe, under same press<br>The volume of kerosene that flows is  | ure difference and same time collects 1 lit of coconut   | t oil.         |  |
|      | (A) 5.5 lit<br>(C) 7.7 lit   | (B) 6.6 lit<br>(D) 8.8 lit   |                |  |
| 122. | <ul><li>There is a circular hole in metal plate. W</li><li>(A) increased</li><li>(C) unchanged</li></ul>   | hen the plate is heated the radius of the hole become<br>(B) decreased<br>(D) depends on metal   | s              |  |
| 123. | Specific heat of a substance depends on given to substance   | 1. Nature of substance. 2. Mass of substance. 3. Heat  |                |  |
|      | <ul><li>(A) Only 1 is correct</li><li>(C) All are correct</li></ul>  | <ul><li>(B) Both 1 and 2 are correct</li><li>(D) Only 1 and 3 are correct</li></ul>  |                |  |
| 124. | In a give process dW=0, dq is <0 then for<br>(A) Temperature increases<br>(C) Pressure increases   | r a gas<br>(B) Volume decreases<br>(D) Pressure decreases  |                |  |
| 125. | The efficiency of carnot engine depends<br>(A) Working substance   | on (B) Sink temperature  |                |  |
|      | (C) Source temperature   | (D) Both B and C   |                |  |

| 126. | A 200 turn coil of self inductance 30 mH carries a current of 5 mA. Find the magnetic flux linked with each turn of coil.                       |   |  |  |
|------|---|---|--|--|
|      | (A) $7.5 \times 10^{-7} \text{Wb}$  | (B) $1.6 \times 10^{-7} \text{Wb}$  |  |  |
|      | (C) $3 \times 10^{-7}$ Wb   | (D) $1.5 \times 10^{-7} \text{Wb}$  |  |  |
| 127. | The instantaneous value of current in an AC circu time, the current will be maximum?  | it is I = 2 sin (100 $\pi$ t + $\pi/3$ ) A. At what first   |  |  |
|      | (A) $1/100 \text{ s}$   | (B) 1/200 s   |  |  |
|      | (C) $1/500 \text{ s}$   | (D) 1 s   |  |  |
| 128. | What in electric system represents force in mecha   | nical system ?  |  |  |
|      | (A) L $(C)$ $1/C$   | (B)  1  |  |  |
|      | (C) 1/C   | (D) q   |  |  |
| 129. | A capacitor of 1 $\mu$ F is charged with 0.01C of elect   | tricity. How much energy is stored in it?   |  |  |
|      | (A) = 50J<br>(C) = 50J  | (B) $40J$<br>(D) $60I$  |  |  |
|      | (C) 505   |   |  |  |
| 130. | An electromagnetic wave is travelling in vacuum<br>a medium having relative electric and magnetic pe<br>(A) $3/\sqrt{2} \times 10^8 \text{m/s}$ | with a speed of 3 x $10^8$ m/s. Find the velocity in<br>ermeability 2 and 1, respectively.<br>(B) $1.5 \times 10^8$ m/s |  |  |
|      | (C) $2 \times 10^8 \text{m/s}$  | (D) No change   |  |  |
|      |   |   |  |  |
| 131. | Trace the path of a ray of light passing through a grefractive index of glass is $\sqrt{3}$ , find out the value of                             | glass prism as shown in the figure. If the of angle of emergence from prism.  |  |  |
|      | 60  |   |  |  |
|      | $(\Lambda)$ 20  | (P) 45  |  |  |
|      | (A) = 50<br>(C) = 60  | (D) 75  |  |  |
|      |   |   |  |  |
| 132. | Light wave from two coherent sources of intensiti<br>the ratio of maxima and minima of the interference   | es in ratio 64:1 produces interference. Calculate e pattern.  |  |  |
|      | (A) 8:1   | (B) 64:1  |  |  |
|      | (C) 9:7   | (D) 81:49   |  |  |
| 133  | In young's experiment the width of the fringes of   | stained with light of wavelength 6000 $A^0$ is 2  |  |  |
| 100. | mm. What will be the fringe width, if the entire ap index 1.33?   | oparatus is immersed in a liquid of refractive  |  |  |
|      | (A) 1 mm  | (B) 1.5 mm  |  |  |
|      | (C) 2 mm  | (D) 2.5 mm  |  |  |
| 134. | Unpolarised light is incident on plane glass surfac   | e. What should be the angle of incidence in   |  |  |
|      | degrees, so that the reflected and refracted rays are $(A) = 27$  | e perpendicular to each other?  |  |  |
|      | (A) $37$  | (B) $4^{7}$   |  |  |
|      | (C) = 57  | (D) 6/  |  |  |

135. Determine the de-Broglie wavelength associated with an electron, accelerated through a potential difference of 100 V.

| (A) | $1.227A^{0}$ | (B) | $12.27A^{0}$ |
|-----|--------------|-----|--------------|
| (C) | $122.7A^{0}$ | (D) | $1227A^{0}$  |

136. A particle with rest mass  $m_0$  is moving with velocity c. What is the de-Broglie wavelength associated with it?

| (A) | infinity   | (B) | zero  |
|-----|------------|-----|-------|
| (C) | radio wave | (D) | X ray |

- 137. Which among the following series gives visible light?
  - (A) Lyman(B) Balmer(C) Bracket(D) None of these
- 138. Identify the logic operation performed by this circuit



139. The number of silicon atoms per m<sup>3</sup> is 5 x  $10^{28}$ . This is doped simultaneously with 5 x  $10^{22}$  atoms per m<sup>3</sup> of arsenic and 5 x  $10^{20}$  atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ .

| (A) | $4.54 \ge 10^9 \text{m}^{-3}$   | (B) | $4.95 \times 10^{22} \text{m}^{-3}$ |
|-----|---------------------------------|-----|-------------------------------------|
| (C) | $1.5 \ge 10^{16} \text{m}^{-3}$ | (D) | $5 \ge 10^{28} \text{m}^{-3}$       |

140. Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre on the positive charge side along the axial line.

| (A) | $4.5 \times 10^{5} \text{N/C}$ | (B) | 4.5 x 10°NC               |
|-----|--------------------------------|-----|---------------------------|
| (C) | 4.5 x 10 <sup>-5</sup> N/C     | (D) | 4.5 x 10 <sup>-5</sup> NC |

- 141. If the Gaussian surface is so chosen that there are some charges inside and some outside then the electric field is due to
  - (A) Only inside charges (B) Only outside charges
  - (C) All the charges

(D) Cannot determine

142. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



143. Net capacitance of 3 identical capacitor in series is  $1\mu F$ . What is the net capacitance in  $\mu F$  if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

144. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.
(A) 2s
(B) 1s

| (11) | 23   | (D) | 15    |
|------|------|-----|-------|
| (C)  | 0.5s | (D) | 0.25s |

145. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

146.



| 147. | Two i<br>distar           | Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find B at the midpoint of the axis between them if same current I flows through |                    |  |  |  |
|------|---------------------------|--|--------------------|--|--|--|
|      |                           | 100  ps.   | <b>(D</b> )        | $1 \cdot 1 \cdot 1^{3/2}$  |  |  |
|      | (A)                       | $\mu_0 I/2 I$  | (B)                | $\mu_0 2 I/2 r$  |  |  |
|      | (C)                       | $\mu_0 1/4\pi$ r   | (D)                | Cannot be determined   |  |  |
| 148. | A blo<br>0.8. It<br>betwe | ck of mass 4 kg is kept on a rough horizontal<br>f a force of 19 N is applied on the block paral<br>een the block and floor is:  | surface            | ce. The coefficient of static friction is the floor, then the force of friction                              |  |  |
|      | (A)                       | 19N  | (B)                | 18 N   |  |  |
|      | (C)                       | 16N  | (D)                | 9.8N   |  |  |
| 149  | Curre                     | ent in a circuit falls steadily from 2A to 0A in   | 10 ms              | Calculate L if emf induced is 200V   |  |  |
| 117. | (A)                       | 1H   | (B)                | 2H   |  |  |
|      | $(\Gamma)$                | 311  | $(\mathbf{D})$     | 211<br>ЛН  |  |  |
|      | (C)                       | 511  | (D)                | 411  |  |  |
| 150. | Self i<br>core.           | nductance of the air core inductor increases f<br>What is the relative permeability of the core  | rom 0.<br>used?    | 01 mH to 10 mH on introducing an iron  |  |  |
|      | (A)                       | 500  | (B)                | 800  |  |  |
|      | (C)                       | 900  | (D)                | 1000   |  |  |
| 151. | Amor                      | ing the following, the most stable complex is $(II_{1} \cap I)^{3+}$   |                    | IE-OILL) 1 <sup>3+</sup>   |  |  |
|      | (A)                       | $[Fe(H_2O)_6]$   | (B)                | $[Fe(NH_3)_6]$   |  |  |
|      | (C)                       | $[\operatorname{Fe}(\operatorname{C}_2\operatorname{O}_4)_3]^2$  | (D)                | $[Fe(CI)_6]^2$   |  |  |
| 152. | Whic<br>metal             | h is the correct coordination number (C.N) at atom in $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?   | nd oxio            | dation number (O.N) of the transition  |  |  |
|      | (A)                       | C.N=3, O.N=+1  | (B)                | C.N=4, O.N=+2  |  |  |
|      | (C)                       | C.N=6, O.N=+1  | (D)                | C.N=6, O.N=+3  |  |  |
| 153. | In a s                    | olid, oxide ions are arranged in ccp, cations A  | A occu             | py one sixth of the tetrahedral voids and  |  |  |
|      | cation                    | B occupy one third of the octanedral voids.  | I  ne I            | A DO   |  |  |
|      | (A)                       | ABO <sub>3</sub>   | (B)                | A <sub>3</sub> BO  |  |  |
|      | (C)                       | $AB_{3}O$  | (D)                | $A_3B_3O_3$  |  |  |
| 154. | On m<br>Whic              | ixing acetone to methanol some of the hydro<br>h of the following statements is correct about  | gen bo<br>t the al | onds between methanol molecules break.   |  |  |
|      | (A)                       | At specific composition methanol acetone<br>mixture will form minimum boiling<br>azeotrope and show positive deviation   | (B)                | At specific composition methanol<br>acetone mixture will form maximum<br>bailing azeotrope and show positive |  |  |
|      |                           | from Racult's law  |                    | deviation from Racult's law  |  |  |
|      | $(\mathbf{C})$            | At specific composition methanol acetone   | (D)                | At specific composition methanol   |  |  |
|      |                           | mixture will form minimum boiling  | (D)                | acetone mixture will form maximum  |  |  |
|      |                           | azeotrone and show negative deviation  |                    | holling azeotrope and show negative  |  |  |
|      |                           | from Raoult's law  |                    | deviation from Raoult's law  |  |  |

solubility is: (A) formaldehyde<methane<carbon (B) formaldehyde< carbon dioxide dioxide<argon <methane<argon argon<carbon dioxide< argon <methane <carbon dioxide (C) (D) methane<formaldehyde < formaldehyde The number of faradays of electricity required for electrolytic conversion of the mole of 156. nitrobenzene to aniline is: (A) 3F **(B)** 4F 6F (D) 5F (C) The positive value of the standard electrode potential of  $Ag^+/Ag$  indicates that: 157. (A) This redox couple is a stronger reducing (B) This redox couple is a stronger oxidizing agent than  $H^+/H_2$  couple agent than  $H^+/H_2$  couple Ag can displace H<sub>2</sub> from acid Ag can displace  $H_2$  from base (C) (D) Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The decrease in 158. reaction rate is due to: A decrease in surface area A decrease in  $\triangle$  H for the reaction (A) **(B)** A decrease in the fraction of particles The introduction of an alternative (C) (D) possessing sufficient energy pathway with greater activation energy. 159. Which of the following statements is not correct? The rate of a reaction decreases with **(B)** The instantaneous rate a reaction is (A) passage of time as concentration of same at any time during the reaction reactants decrease For a zero order reaction the (D) The rate of a reaction decreases with (C) concentration of reactants remains increase in concentration of reactant (s) changed with passage of time 160. Which of the following gases shows the lowest adsorption per gram of charcoal? The critical temperatures are given in parenthesis: (B) (A) H<sub>2</sub> (33K) CH<sub>4</sub>(190K) (D)  $CO_2(304K)$ SO<sub>2</sub>(630K) (C) Freundlich adsorption isotherm is given by the expression  $x/m=kp^{1/n}$ . Which of the following 161. statements are false? i When 1/n=0, the adsorption is independent of pressure. ii. When n=0, the plot of x/m vs p graph is a line parallel to x axis. When 1/n=0, the adsorption is directly proportional to pressure. iii. When n=0, plot of x/m vs p is a curve iv. (A) i and ii (B) ii and iv i and iii (C) (D) all are false 162. In the extraction of chlorine by electrolysis of an aqueous solution of sodium chloride, which of the following statements are true?  $\triangle$  G<sup>0</sup> for the overall reaction is positive  $\triangle$  G<sup>0</sup> for the overall reaction is negative i. ii.  $E^0$  for the overall reaction is positive iii.  $E^0$  for the overall reaction is negative iv. i and iii i and iv **(B)** (A) (C) ii and iii (D) iii and iv

 $K_{\rm H}$  value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10<sup>-5</sup>

and 0.413, respectively. The correct arrangement of these gases in the order of their increasing

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| 163. Which of the following pairs of ions are isoelectronic and isostructural? |                          |   |  |  |
|--|--------------------------|---|--|--|
|  | (A)                      | $NO_2^+$ and $NO_3^-$   | (B)  | $ClO_3^-$ and $ICl_4^-$  |
|  | (C)                      | $XeO_3^{2-}$ and $PCl_3$  | (D)  | $\text{ClO}_3^-$ and $\text{SO}_3^{2-}$  |
| 164.   | Which                    | n of the following hydrides is the strongest rea  | ducing   | agent?   |
|  | (A)                      | NH <sub>3</sub>   | (B)  | PH <sub>3</sub>  |
|  | (C)                      | AsH <sub>3</sub>  | (D)  | SbH <sub>3</sub>   |
| 165  | Consi                    | der the reactions   |  |  |
| 105.   | i                        | $Zn + Conc HNO_2$ (hot) $\longrightarrow$ Zn (N   | $(O_2)_2 +$  | $-X + H_2O$  |
|  | ii.                      | $Zn + dil. HNO_3 (cold) \longrightarrow Zn (N)$   | $(O_3)_2 + (O_3)_2 + (O_3$ | $+ Y + H_2O$   |
|  | (4)                      | N <sub>2</sub> O NO   | (B)  | $NO_2 NO_2$  |
|  | $(\mathbf{C})$           | $N_2$ , $N_2$ O   | (D)  | $NO_2, NO_2$   |
| 166  | When                     | KMnO acts as an avidizing agent in weakly   | (-)  | no modium the evidetion number of  |
| 100.   | manga                    | $\frac{1}{100}$ acts as an oxidizing agent in weakly anese decreases by:  | aikaii   | the medium, the oxidation number of  |
|  | (A)                      | 1   | (B)  | 2  |
|  | (C)                      | 3   | (D)  | 5  |
| 167.   | Acidif                   | ied potassium dichromate solution turns gree  | n whe  | n $Na_2SO_3$ is added to it due to the   |
|  | format                   | tion of:  |  |  |
|  | (A)                      | $\operatorname{CrSO}_4$   | (B)  | $Cr_2(SO_4)_3$   |
|  | (C)                      | $CrO_4^2$   | (D)  | $Cr_2(SO_3)_3$   |
| 168.   | The d-<br>Which<br>numbe | -electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ and none of the following complexes will exhibit ers of $Cr=24$ , $Mn=25$ , $Fe=26$ , $Co=27$ ) | nd Co <sup>2</sup><br>minin  | <sup>+</sup> are $d^4$ , $d^5$ , $d^6$ and $d^7$ , respectively.<br>num paramagnetic behavior? (atomic |
|  | (A)<br>(C)               | $[Cr(H_2O)_6]^{2+}$<br>[Fe(H_2O)_1^{2+}   | (B)<br>(D)   | $[Mn(H_2O)_6]^{2+}$<br>$[Co(H_2O)_6]^{2+}$   |
| 160  | When                     | 2 Bromonentane is heated with notassium et  | (D)<br>hovida  | in athenol, the major product obtained   |
| 107.   | is:                      | 2-bromopentalie is heated with potassium et   | πολιάν   | e în culanoi, înc înajor product obtained  |
|  | (A)                      | 2-Ethoxypentane   | (B)  | Pent-1-ene   |
|  | (C)                      | Cis-Pent-2-ene  | (D)  | Trans-Pent-2-ene   |
| 170.   | Which                    | of the following undergoes nucleophilic sub   | stituti  | on exclusively by $S_N^1$ mechnism?  |
| - / • •  | (A)                      | Chloroethane  | (B)  | Isopropyl chloride   |
|  | (C)                      | Chlorobenzene   | (D)  | Benzyl chloride  |
| 171.   | The nu                   | umber of possible stereoisomers for CH <sub>3</sub> CH=   | CHCH   | $H_2$ CH(Br)CH <sub>3</sub> is:  |
|  | (A)                      | 8   | (B)  | 2  |
|  | (C)                      | 4   | (D)  | 6  |
| 172.   | 2-Met                    | hoxy-2-methylpropane on heating with HI pr  | oduce  | S:   |
|  | (A)                      | Methanol and sec-propyl iodide  | (B)  | Methyl iodide and tert-butyl alcohol   |
|  | (C)                      | Methyl iodide and isobutene   | (D)  | Methanol and tet-butyl iodide  |
| 173.   | The le                   | ast acidic compound among the following is:   |  |  |
|  | (A)                      | o-Nitrophenol   | (B)  | m-Nitrophenol  |
|  | (C)                      | p-Nitrophenol   | (D)  | Phenol   |
| 174.   | An alk                   | kene $C_7H_{14}$ on reductive ozonolysis gives an a   | aldehy   | de with formula C <sub>3</sub> H <sub>6</sub> O and a ketone.  |
|  | The ke                   | etone is:   | <i>(</i> <b>-</b> )  | • •  |
|  | (A)                      | 2-Butanone  | (B)  | 2-Pentanone  |
|  | (C)                      | 3-Pentanone   | (D)  | Propanone  |
|  |                          |   |  |  |

| 175. | The in Aceto   | ncreasing order of the rate of addition of HC                                      | CN to the                 | e compounds i) Formaldehyde ii)                      |
|------|----------------|--|---------------------------|--|
|      | (A)            | i <ii <="" iii<="" iv<="" td=""><td>(B)</td><td>iv&lt; ii&lt; iii &lt; i</td></ii> | (B)                       | iv< ii< iii < i                                      |
|      | (C)            | iv <iii< i<="" ii<="" td=""><td>(D)</td><td>iv&lt; i&lt; ii&lt; iii</td></iii<>    | (D)                       | iv< i< ii< iii                                       |
| 176. | The c          | arboxylic acid that does not undergo Hell-V  | ohlard-                   | Zelinsky reaction is:                                |
|      | (A)            | CH <sub>3</sub> COOH   | (B)                       | (CH <sub>3</sub> ) <sub>2</sub> CHCOOH               |
|      | (C)            | CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH                               | (D)                       | (CH <sub>3</sub> ) <sub>3</sub> CCOOH                |
| 177. | $C_2H$         | $H_5 NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/BT_2} Y \xrightarrow{P}$       | $\rightarrow$ (exce       | Z.   |
|      | In the         | above sequence, Z is:  | (0,000                    |  |
|      | (A)            | cyanoethane  | (B)                       | ethanamide   |
| 170  | (C)            | methanamine  | (D)                       | ethanamine   |
| 1/8. | value          | ?  | at para p                 | bosition in animine will raise the $K_b$             |
|      | (A)            | -SO <sub>3</sub> H   | (B)                       | -OH  |
|      | (C)            | -F   | (D)                       | -Br  |
| 179. | Whic           | h of the following is an example of globular                                       | protein                   | ?  |
|      | (A)            | myosin   | (B)                       | collagen   |
|      | (C)            | keratin  | (D)                       | haemoglobin  |
| 180. | Whic           | h one of the following is synthesized in our                                       | body by                   | / sun rays?  |
|      | (A)            | Vitamin D  | (B)                       | Vitamin B  |
|      | (C)            | Vitamin K  | (D)                       | Vitamin A  |
| 181. | Capro          | plactum is the is the starting material for the                                    | synthes                   | is of  |
|      | (A)            | Nylon-6  | (B)                       | Nylon6,6   |
|      | (C)            | Terylene   | (D)                       | Nylon 10   |
| 182. | The s          | pecies which can serve as an initiator for car                                     | tionic p                  | olymerization is                                     |
|      | (A)            | Lithium aluminium hydride  | (B)                       | Nitric acid  |
|      | (C)            | Aluminium chloride   | (D)                       | BuL1   |
| 183. | Aspir          | in is an:  |                           |  |
|      | (A)            | analgesic  | (B)                       | antipyretic  |
|      | (C)            | antimalarial   | (D)                       | Both analgesic and antipyretic                       |
| 184. | The e          | quivalent mass of iron in the reaction 2Fe +                                       | $3Cl_2 \rightarrow$       | • 2FeCl <sub>3</sub> is:                             |
|      | (A)            | Half of its atomic mass  | (B)                       | One third of its atomic mass                         |
|      | (C)            | Same as atomic mass  | (D)                       | One fourth of its atomic mass                        |
| 185. | Whick          | h of the following sets of quantum numbers $\frac{1}{2}$                           | is corre                  | ect for an electron in 4f subshell?                  |
|      | (A)            | $n=4, l=3, m=4, s=\pm 1/2$<br>$n=4, l=3, m=\pm 1, s=\pm 1/2$                       | (B)                       | n=4, l=3, m=-4, s=-1/2<br>$n=3, l=2, m=-2, s=\pm1/2$ |
| 105  | (C)            | m-4, r-5, m-1, s-1/2   | (D)                       | m=3, n=2, m=-2, s=+1/2                               |
| 186. | The c          | orrect sequence of atomic radii is:  | <b>(D)</b>                |  |
|      | (A)            | Nd>Mg>A1>S1<br>Si>A1>Mg>Na   | (B)<br>(D)                | AI > SI > Na > Mg<br>Si > AI > Na > Mg               |
| 107  |                | · · · · · · · · · · · · · · · · · · ·  |                           |  |
| 187. | $\ln wh$       | ich of the following, the bond angle around  | the centre $(\mathbf{P})$ | tral atom is maximum?                                |
|      | (A)            |  | (D)<br>(D)                | SCI2   |
|      | $(\mathbf{c})$ | ,  |                           |  |

| 188. | Which                            | of the following molecule does not exist   |                                 |  |
|------|----------------------------------|--|---------------------------------|--|
|      | (A)<br>(C)                       | NF <sub>3</sub><br>PF <sub>5</sub>   | (B)<br>(D)                      | NF5<br>N2H4  |
| 189. | If heli                          | um is allowed to expand in vacuum, it liberat  | es hea                          | t because  |
|      | (A)                              | It is an inert gas   | (B)                             | It is an ideal gas   |
|      | (C)                              | Its critical temp. is low  | (D)                             | It is a light gas  |
| 190. | i) H <sub>2</sub> (g             | $g_1 + 1/2O_2(g) \rightarrow H_2O(I) + x \text{ KJ}$ ii) $H_2(g) + 0$  | 1/2O <sub>2</sub> (             | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two   |
|      | (A)                              | x > y  | (B)                             | $\mathbf{X} < \mathbf{V}$  |
|      | (C)                              | $\mathbf{x} = \mathbf{y}$  | (D)                             | $\mathbf{x} + \mathbf{y} = 0$  |
| 191. | If the l<br>respec<br>(A)<br>(C) | bond dissociation energies of XY, $X_2$ , $Y_2$ (all tively and $\Delta_f H$ of XY is -200KJmol <sup>-1</sup> , the bor 400 KJmol <sup>-1</sup><br>200 KJmol <sup>-1</sup> | diator<br>nd diss<br>(B)<br>(D) | nic molecules) are in the ratio 1:1:0.5,<br>sociation energy of $X_2$ will be:<br>300 KJmol <sup>-1</sup><br>100 KJmol <sup>-1</sup> |
| 192  | What                             | will be the correct order of vapour pressure o   | f wate                          | r ethanol and ether at 30 <sup>0</sup> C? Given that   |
| 172. | among                            | these compounds water has maximum boiling  | ng poi                          | nt and ether has minimum boiling point.  |
|      | (A)                              | Water <ether<ethanol< td=""><td>(B)</td><td>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<>   | (B)                             | Water <ethanol<ether< td=""></ethanol<ether<>  |
|      | (C)                              | Ether <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>   | (D)                             | Ethanol <ether<water< td=""></ether<water<>  |
| 193. | Which consta                     | of the following will occur if a 0.1M solution nt temperature?   | n of a                          | weak acid is diluted to 0.01M at   |
|      | (A)                              | [H <sup>+</sup> ] will decrease to 0.001M  | (B)                             | pH will decrease   |
|      | (C)                              | Percentage ionization will increase  | (D)                             | K <sub>a</sub> will increase   |
| 194. | Which<br>(A)                     | of the following species involves the transfe $MnO_4^{2-} \rightarrow MnO_4^{}$  | r of 51<br>(B)                  | $N_A$ electrons per mole of it ?<br>MnO <sub>4</sub> <sup>-</sup> $\rightarrow$ Mn <sup>2+</sup>                                     |
|      | (C)                              | $MnO_4^- \rightarrow MnO_2$  | (D)                             | $CrO_4^{2} \rightarrow Cr^{3+}$  |
| 195  | 30-vol                           | ume hyderogen peroxide means.  |                                 |  |
| 190. | (A)                              | $30\% H_2O_2$ by volume  | (B)                             | $30g$ of $H_2O_2$ solution containing 1g of it   |
|      | (C)                              | 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ gas at STP   | (D)                             | $30 \text{ cm}^3$ of the solution contains one mole of $H_2O_2$  |
| 196  | The co                           | prrect sequence of covalent character is repres  | sented                          | by.  |
| 190. | (A)                              | LiCl <nacl<becl<sub>2</nacl<becl<sub>  | (B)                             | BeCl <sub>2</sub> <licl<nacl< td=""></licl<nacl<>  |
|      | (C)                              | NaCl <licl< becl<sub="">2</licl<>  | (D)                             | BeCl <sub>2</sub> <nacl<licl< td=""></nacl<licl<>  |
| 197. | Which                            | of the following is known as pyrene?   |                                 |  |
|      | (A)                              | CCl <sub>4</sub>   | (B)                             | CS <sub>2</sub>  |
| 100  | (C)                              | $S_2Cl_2$  | (D)                             | Solid CO <sub>2</sub>  |
| 198. | The m                            | ost stable carbocation amongst the following $(CU)$ $CU^+$   | 1S:                             | $\mathbf{D}$ $\mathbf{C}^+$  |
|      | (A)                              | $(CH_3)_2CH$   | (B)                             | $Pn_3C$  |
|      | (C)                              | C113C112   | (D)                             |  |
| 199. | The m                            | olecule that will have dipole moment is:   |                                 |  |
|      | (A)                              | 2,2-Dimethylpropane  | (B)                             | cis-2-Butene   |
| 200  | (C)                              | trans-2-Butene   | (D)                             | 2,2,3,3-1 etramethylbutane   |
| 200. | Ut the                           | Ive isomeric hexanes, the isomer which can   | give t                          | two monochlorinated compound is:   |
|      | (A)                              | 2-ivieinyipentane  | (D)<br>(R)                      | 2,2-Dimethylbutane   |
|      | (U)                              | 2,5-Dimeniyibutane   | (D)                             | п-пехане   |

| Sr. | Question |
|-----|----------|
| No. |          |

| 1. | 1+ sin<br>(A)<br>(C)            | x + sin <sup>2</sup> x + up to $\infty = 4 + 2\sqrt{3}, 0 < x < \Pi$<br>$\frac{\pi}{6}, \frac{\pi}{3}, \frac{\pi}{6}$<br>$2\frac{\pi}{3}, \frac{\pi}{6}$ | and x<br>(B)<br>(D)             | $\neq \frac{\pi}{2} \text{ then } \mathbf{x} = \frac{\pi}{3}, 5\frac{\pi}{6}$ $\frac{\pi}{3}, 2\frac{\pi}{3}$  |
|----|---------------------------------|--|---------------------------------|--|
| 2. | A cow<br>tight. I<br>(A)<br>(C) | is tied to a post by a rope. The cow moves al<br>of it describes 44 meters, when it has traced on<br>35 meters<br>56 meters                              | long tl<br>ut 72°<br>(B)<br>(D) | he circular path always keeping the rope<br>at the centre, the length of the rope is<br>22 meters<br>45 meters |
| 3. | If f(x                          | $f(x) = \int_{-\pi}^{x}  t   dt, for any  x \ge 0, f(x) =$   |                                 |  |
|    | (A)                             | $\frac{1}{2}(1-x^2)$   | (B)                             | $1 - x^2$  |
|    | (C)                             | $\frac{1}{2}(1+x^2)$   | (D)                             | $1 + x^2$  |
| 4. | The to                          | tal of number of terms in the expansion of (x  | $(+ y)^{10}$                    | $^{00}$ + (x-y) <sup>100</sup> after simplification is   |
|    | (A)                             | 50   | (B)                             | 51   |
|    | (C)                             | 202  | (D)                             | 100  |
| 5. | The m                           | the maximum value of $\frac{\log x}{x}$ in $(2,\infty)$ is   |                                 |  |
|    | (A)                             | 1  | (B)                             | 2  |
|    | (C)                             | e  | (D)                             | $\frac{e}{1}$  |
| 6  |                                 | 1 1 1  |                                 | E  |
| n  |                                 |  |                                 |  |

6.

7.

The series  $\frac{1}{2 \cdot 5} + \frac{1}{5 \cdot 8} + \frac{1}{8 \cdot 11} + \dots \dots$  up to n terms is equal to (A)  $\frac{n}{4n+6}$ (B)  $\frac{1}{6n+4}$ (C)  $\frac{n}{6n+4}$ (D)  $\frac{\frac{1}{6n+4}}{3n+7}$   $\lim_{x \to 1} \frac{\tan(x^2 - 1)}{x - 1} \text{ equals}$ 

(A) 
$$2$$
 (B)  $\frac{1}{2}$   
(C)  $-2$  (D)  $-\frac{1}{2}$ 

8. If 
$$x^m y^n = (x + y)^{m+n}$$
 then  $\frac{dy}{dx}$  is equal to  
(A)  $\frac{x + y}{xy}$ 
(B)  $xy$ 
(C)  $0$ 
(D)  $\frac{y}{x}$ 

| 9.  | 16                 | $-sin^{-1}(t^2-1)$ and $x - sec^{-1}(\frac{1}{t^2-1})$ then $\frac{dy}{dx}$                        | is equa                       | ıl to                        |
|-----|--------------------|--|-------------------------------|------------------------------|
|     | $If y = (\Delta)$  | $\begin{array}{c} x \\ x \end{array} = e^{-x}  \text{and}  x = e^{-x}  (x^{2} - 1)^{2}  \text{ax}$ | (B)                           | y                            |
|     | (11)               | $\overline{\gamma}$  | (D)                           | $-\frac{x}{x}$               |
|     | (C)                | <u>y</u>   | (D)                           | _ <u>x</u>                   |
|     |                    | x  |                               | у                            |
| 10. | E in d             | the sum of $1^{st}$ is terms of the series $1^2$   | 1 <sup>2</sup> -              | $+2^{2}$ $1^{2}+2^{2}+3^{2}$ |
|     | rinu               | the sum of 1 in terms of the series $\frac{1}{1}$  | $\overline{1}$                | +2 $+$ $1+2+3$ $+$ ,         |
|     | (A)                | $\frac{n+2}{2}$  | (B)                           | $\frac{n(n+2)}{2}$           |
|     | (C)                | n(n-2)   | (D)                           | n(n-2)                       |
|     |                    | 3  |                               | 6                            |
| 11. | Thom               | $\pi_{1}$  |                               |                              |
|     |                    | 1 is equal to  | <b>(D)</b>                    | / <del>-</del> .             |
|     | (A)                | $\frac{1}{2}$  | (B)                           | $\sqrt{2} + 1$               |
|     | (C)                | 1  | (D)                           | $1 - \sqrt{2}$               |
|     |                    | $\overline{\sqrt{2}+1}$  |                               | •                            |
| 12. | The s              | olution for the differential equation $\frac{dy}{dy}$  | $\frac{1}{2} + \frac{dy}{dy}$ | $\frac{\alpha}{2} = 0$ is    |
|     | (1)                | 1 1  | $\dot{x}$                     |                              |
|     | (A)                | $\frac{1}{2} + \frac{1}{2} = c$  | (В)                           | $\log x \cdot \log y = c$    |
|     | (C)                | y = x<br>xy = c  | (D)                           | x + y = c                    |
| 13  |                    | 1 1 5  |                               | 2                            |
| 101 | If PA              | $A = \frac{1}{3}, PB = \frac{1}{4}, P(A \cup B) = \frac{1}{12}, then P(A)$                         | / B)                          | =                            |
|     | (A)                | 25   | (B)                           | 5                            |
|     | $(\mathbf{C})$     | 16<br>16   | <b>(D)</b>                    | 4                            |
|     | (C)                | $\frac{10}{25}$  | (D)                           | $\frac{2}{3}$                |
| 14  | If (a              | $(-2)r^2 \pm 9v^2 - 4$ represents rectangular  | r hyn                         | erhola then a equals         |
| 11. | (A)                | 0  | (B)                           | 2                            |
|     | (C)                | 9  | (D)                           | None of these                |
| 15. | $_{If} \nabla$     | $n = 55$ then the value of $\sum n^2$ is equal   | lto                           |                              |
|     | $\sum_{(n)}^{(1)}$ | $n = 53$ , then the value of $\sum_{i=2}^{n} n$ is equal   | $(\mathbf{D})$                | 506                          |
|     | (A)<br>(C)         | 385<br>1115  | (B)<br>(D)                    | 3025                         |
| 16  | (0)                | 1110   | (D)                           | 5025                         |
| 10. | The 1              | 1 <sup>th</sup> term in expansion of $\left(x + \frac{1}{\sqrt{x}}\right)^{-1}$ is                 |                               |                              |
|     | (A)                | 999  | (B)                           | 1001                         |
|     | $(\mathbf{C})$     | <i>x</i>   | $(\mathbf{D})$                | $\frac{x}{x}$                |
|     | (C)                | 1  | (D)                           | 1001                         |

| 17. | $\int_{1}^{\frac{\pi}{2}}$   | $\frac{\sin^{1000} x  dx}{\cos^{1000} x \sin^{1000} x}$ is equal to  |                           |  |
|-----|------------------------------|--|---------------------------|--|
|     | J <sub>o</sub> si            | $in^{1000}x + cos^{1000}x$   |                           |  |
|     | (A)                          | $\frac{1000}{\pi}$   | (B)                       | $\frac{1}{\pi}$  |
|     | (C)                          | $\frac{\pi}{2}$  | (D)                       | $\frac{\pi}{4}$  |
| 18. | $f e^x$                      | $x^5 dx$ is  |                           |  |
|     | (A)<br>(C)                   | $e^{x}[x^{5} + 5x^{4} + 20x^{3} + 60x^{2} + 120x + 120] + C$<br>$e^{x}[x^{5} - 5x^{4} + 20x^{3} - 60x^{2} + 120x - 120] + C$ | (B)<br>(D)                | $e^{x}[x^{5} - 5x^{4} - 20x^{3} - 60x^{2} - 120x - 120] + C$<br>$e^{x}[x^{5} + 5x^{4} + 20x^{3} - 60x^{2} - 120x + 120] + C$ |
| 19. | $\int \frac{1}{\sec \theta}$ | $\frac{\sec x}{\cos x + \tan x} dx \text{ is equal to}$  |                           |  |
|     | (A)<br>(C)                   | $\tan x - \sec x + C.$ $\sec x + \tan x + C.$  | (B)<br>(D)                | log (1 + sec x) + C.<br>log sin x + log cos x + C.   |
| 20. | If f(                        | $f(x) + be^{ax} + ae^{bx}$ , then $f''(0) =$   |                           |  |
|     | (A)                          | 0  | (B)                       | 2ab  |
|     | (C)                          | ab(a+b)  | (D)                       | ab   |
| 21. | The l<br>(A)                 | length of the latus rectum of the parabor $\frac{4}{-}$  | la 4y <sup>2</sup><br>(B) | $x^{2} + 3x + 3y + 1 = 0$ is<br>7  |
|     | (C)                          | 3<br>12  | (D)                       | $\frac{3}{4}$  |
| 22. | The p                        | principal value of $\sin^{-1} \tan\left(-\frac{5\pi}{4}\right)$ is   |                           |  |
|     | (A)                          | $\frac{\pi}{2}$  | (B)                       | <u></u>  |
|     | $(\mathbf{C})$               | $\frac{4}{\pi}$  | (D)                       | $\frac{4}{\pi}$  |
|     | (C)                          | 2  | (D)                       | $-\frac{1}{2}$   |
| 23. | If y                         | $= e^{m \sin^{-1}x}$ , then $\frac{d^2y}{dx^2}$ at $x = 0$ is  |                           |  |
|     | (A)                          | m  | (B)                       | $m^2$  |
|     | (C)                          | $-m^2$   | (D)                       | 2 <i>m</i>   |
| 24. | If y                         | $= \sin(2 \sin^{-1}x)$ , then it satisfies the diff  | erent                     | ial equation   |
|     | (A)                          | $(1 - x^2)y_2 - xy_1 + 4y = 0.$  | (B)                       | $(1+x^2)y_2 - xy_1 + 4y = 0.$  |
|     | (C)                          | $(1-x^2)y_2 - xy_1 + y = 0.$   | (D)                       | $(1+x^2)y_2 - xy_1 + 4y = 0.$  |
| 25. | The 1                        | value of $\cos \left[ 2 \tan^{-1} \frac{1+x}{1-x} + \sin^{-1} \frac{1-x^2}{1+x^2} \right]$                                   | is                        |  |
|     | (A)                          | $\sqrt{2}$   | (B)                       | 1  |
|     | (C)                          | 0  | (D)                       | -1   |
| 26. | The e                        | equation of the circle which touches the x-axis  | s and v                   | whose centre is $(1,2)$ , is   |
|     | (A)                          | $x^2 + y^2 - 2x + 4y + 1 = 0.$   | (B)                       | $x^2 + y^2 - 2x - 4y + 1 = 0.$   |
|     | (C)                          | $x^2 + y^2 + 2x + 4y + 1 = 0.$   | (D)                       | $x^2 + y^2 + 4x + 2y + 1 = 0.$   |

| 27. | The differential equation $y \frac{dy}{dx} + x = c$ represents |  |                           |  |
|-----|--|--|---------------------------|--|
|     | (A)  | A family of hyperbolas   | (B)                       | A family of circles whose centres are on the v-axis.                           |
|     | (C)  | A family of parabolas  | (D)                       | A family of circles whose centres are on the x-axis.                           |
| 28. | A stor<br>by, $x+$   | he is thrown vertically upwards and the heigh $-80t - 16t^2$ . The stone reaches the maximum | t x ft r<br>height        | eached by the stone in t seconds is given                                      |
|     | (A)<br>(C)   | 28<br>3s   | (B)<br>(D)                | 2.5s<br>1.5s   |
| 29. | The a<br>(A)   | rea of the region bounded by $y = 2x - x$<br>$\frac{8}{3}$ sq. units                         | x <sup>2</sup> and<br>(B) | d the x - axis is<br>$\frac{4}{3} sq. units$                                   |
|     | (C)  | $\frac{7}{3}$ sq. units  | (D)                       | $\frac{2}{3}$ sq.units   |
| 30. | If f (   | $x) = \begin{cases} 2a - x, & -a < x < a \\ 3x - 2a, & a < x \end{cases} $ then which        | h of th                   | e following is true  |
|     | (A)<br>(C)   | f(x) is discontinuous at $x = a$ .<br>$f(x)$ is differentiable at $x \ge a$ .                | (B)<br>(D)                | f(x) is not differentiable at $x = a$ .<br>f(x) is continuous at all $x < a$ . |
| 31. | A die<br>probal  | is tossed thrice. If getting an even number is bility distribution is                        | consic                    | lered as success, the variance of the  |
|     | (A)  | $\frac{3}{4}$  | (B)                       | $\frac{1}{2}$  |
|     | (C)  | $\frac{1}{4}$  | (D)                       | $\frac{2}{3}$  |
| 32. | The co   | pordinates of the foot of the perpendicular drawn f  | rom th                    | e point (3,4) on the line $2x + y - 7 = 0$ is                                  |
|     | (A)  | $\left(\frac{9}{5},\frac{17}{5}\right)$  | (B)                       | (1, 5)   |
|     | (C)  | (-5, 1)  | (D)                       | (1, -5)  |
| 33. | The p  | oint $(5, -7)$ lies outside the circle   |                           | 2 2  |
|     | (A)<br>(C)   | $x^{2} + y^{2} - 8x = 0$<br>$x^{2} + y^{2} - 5x + 7y - 1 = 0$                                | (B)<br>(D)                | $x^{2} + y^{2} - 5x + 7y = 0$<br>$x^{2} + y^{2} - 8x + 7y - 2 = 0$             |
| 34. | If tan   | $15^\circ = 2 - \sqrt{3}$ , then 2 tan $1095^\circ + \cot 975^\circ + \tan 975^\circ$        | an (–19                   | $95^{\circ}) =$  |
|     | (A)<br>(C)   | $2 + \sqrt{3}$ $4 - 2\sqrt{3}$   | (B)<br>(D)                | $4 + 2\sqrt{3}$ $2 - \sqrt{3}$   |
| 35. | The n  | umber of circles touching the lines $x = 0$ , $y = 0$  | a and                     | y = b is   |
|     | (A) $(C)$  | Four   | (B)<br>(D)                | Infinite   |
| 36. | The o  | rder and degree of the differential equation   | $1 + (\frac{6}{2})$       | $\left(\frac{dy}{dx}\right)^{5} = \frac{d^{2}y}{dx^{2}}$ are respectively.     |
|     | (A)  | 1, 5   | (B)                       | $\begin{array}{c} dx^{2} \\ 2, 1 \\ 2 \\ \end{array}$                          |
|     | (C)  | 2, 5   | (D)                       | 2,3  |

| 37. | $\frac{x^{2n}-x}{(A)}$       | $y^{2n}$ is divisible by $x - y$   | (B)              | V – X  |
|-----|------------------------------|--|------------------|--|
|     | (C)                          | $\mathbf{x} + \mathbf{y}$  | (D)              | None of these  |
| 38. | Mr. X<br>attend<br>then t    | Thas a 75% chance of attending the annual me<br>ls. Otherwise she has a 50% chance of attendi<br>he probability that Mr X is also there is | eet. M<br>ng. If | iss Y has an 80% chance, if Mr. X also<br>I go to the meet and see Miss Y there, |
|     | (A)                          | $\frac{24}{20}$  | (B)              | $\frac{25}{22}$  |
|     | (C)                          | $\frac{29}{26}$  | (D)              | $\frac{29}{27}$  |
| 39. | $\int^{3}$                   | $\sqrt{4-x}$   |                  | 25   |
|     | $\int_{1} \sqrt{2}$          | $\overline{x} + \sqrt{4-x} dx$   | <b>(D)</b>       | 1  |
|     | (A)<br>(C)                   | 0 3  | (B)<br>(D)       | 2  |
| 40. | a a                          | $\sin x - 1$   |                  |  |
|     | $\lim_{x \to 0} \frac{1}{b}$ | $\frac{\sin x - 1}{\log a}$  | (B)              | $\langle a_{\lambda} \rangle$  |
|     | (A)                          | $\frac{\log u}{\log b}$  | (D)              | $\log\left(\frac{1}{b}\right)$   |
|     | (C)                          | 1  | (D)              | 0  |
| 41. | The v                        | alue of $\frac{C_1}{2} + \frac{C_3}{4} + \frac{C_5}{6} + \dots \dots$ where $C_1, C_3, C_5$  | a                | re the binomial coefficients of order n,   |
|     | is<br>(A)                    | $2^{n+1} - 1$  | (B)              | $2^{n} - 1$  |
|     | (11)                         | $\frac{2}{n+1}$  | (D)              | $\frac{2}{n+1}$  |
|     | (C)                          | $\frac{2^{n+1}}{2}$  | (D)              | $\frac{2^{n+1}+1}{1}$  |
| 42  | <b>T</b> 1                   | n+1  | (n)              |  |
| 12. | n, is                        | alue of $\binom{r}{r} + 2 \binom{r-1}{r-1} + \binom{r-2}{r-2}$ , where   | $\binom{k}{k}$   | denotes the binomial coefficient of order  |
|     | (A)                          | $\binom{n}{r}$   | (B)              | $\binom{n+1}{r}$   |
|     | (C)                          | $\binom{n+2}{n+2}$   | (D)              | None of these  |
| 43. | Whic                         | h one of the following is possible?  |                  |  |
|     | (A)                          | $\cos\theta = \frac{7}{2}$   | (B)              | $\sin\theta = \frac{a^2 + b^2}{a^2 + b^2}, (a \neq b)$                           |
|     | (C)                          | $\sec \theta = \frac{\frac{3}{4}}{5}$  | (D)              | $a^2 - b^{2+\zeta}$<br>$\tan \theta = 45$  |
| 44. | In the                       | expansion of $\left(x^2 - \frac{1}{3x}\right)^9$ the term indep  | enden            | t of x is  |
|     | (A)                          | T <sub>7</sub>   | (B)              | T <sub>6</sub>   |
| 15  | (C)                          | $1_8$ dy   | (D)              | 19   |
| 43. | <i>If x</i> =                | $=e^{y+e^{y+\cdots\infty}}, x>0, then \frac{dy}{dx}$ is  |                  |  |
|     | (A)                          | $\frac{x}{1+x}$  | (B)              | $\frac{1}{\pi}$  |
|     | (C)                          | $\frac{1-x}{1-x}$  | (D)              | $\frac{x}{1+x}$  |
|     |                              | x  |                  | x  |

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| 46.     | $\int e^x \left( \frac{1 + \sin x}{1 + \cos x} \right) dx$ is                           |  |
|---------|---|--|
|         | $(A)  \tan\left(\frac{x}{2}\right) + C$   | (B) $e^x \sin x + C$   |
|         | (C) $e^x \tan\left(\frac{x}{2}\right) + C$  | (D) $e^{x} + C$  |
| 47.     | The function $f(x) = [x]$ , where $[x]$ denotes g                                       | greatest integer function is continuous at   |
|         | (A) -2  | (B) 1.5  |
| 10      |   |  |
| 48.     | If the arithmetic mean of two positive numb<br>(A) $6 \pm \sqrt{7} \cdot 6 = \sqrt{7}$  | bers a and b (a>b) is twice their G.M., then a:b is<br>(B) $2 \pm \sqrt{2} + \sqrt{2}$ |
|         | (1) $0 + \sqrt{7} \cdot 0 - \sqrt{7}$<br>(C) $5 + \sqrt{6} \cdot 5 - \sqrt{6}$          | (D) $2+\sqrt{3} \cdot 2-\sqrt{3}$<br>(D) None of these                                 |
| 49.     | $\lim x \sin(e^{1/x}) \text{ is equal to}$  |  |
|         | $\begin{array}{c} x \rightarrow 0 \\ (A) & 0 \end{array}$                               | (B) 1  |
|         | $(C) = \frac{e}{2}$   | (D) Does not exist   |
| 50.     | Differential coefficient of $e^{x^2}$ with respect                                      | t to $\log x^2$ is   |
|         | (A) $e^{x^2}$   | (B) $xe^{x^2}$   |
|         | (C) $x^2 e^{x^2}$   | (D) $2x^2e^{x^2}$  |
| 51.     | While walking on smooth surface one shoul   | d take small steps to ensure   |
|         | (A) Large friction  | (B) Small friction   |
|         | (C) Larger normal force   | (D) Smaller normal force   |
| 52.     | What happens to a vehicle travelling in an u  | inbanked curved path if the friction between the road                                  |
|         | (A) Moves along tangent   | (B) Moves radially in  |
|         | (C) Moves radially out  | (D) Moves along the curve  |
| 53.     | A ball of mass 0.2 kg strikes an obstacle and   | d moves at $60^{\circ}$ to its initial direction. If its speed                         |
|         | changes from 20m/s to 10m/s the magnitude $(A) = 2\sqrt{7}$                             | e of impulse received by the ball isNs<br>(B) $2\sqrt{2}$                              |
|         | $(1) 2\sqrt{7}$<br>(C) $2\sqrt{5}$  | (D) $3\sqrt{2}$  |
| 54.     | A spacecraft of mass 2000kg moving with 6 of mass 500 kg is stationary. The velocity of | 500 m/s suddenly explodes into two pieces. One piece f other part in m/s is            |
|         | (A) 600<br>(C) 1500   | (B) 800<br>(D) 1000  |
| <i></i> | (C) 1500  | (D) 1000   |
| 33.     | 16 kg 8 kg 4 kg 4 kg  | — The force on 16 kg is?   |
|         | (A) 140N  | (B) 120N   |
|         | (C) 100N  | $\begin{array}{c} (D) & 1201\\ (D) & 80N \end{array}$                                  |
|         |   |  |

56. A man of mass 40 kg is at rest between the walls. If co eff. of friction between man and wall is 0.8, find the normal reaction exerted by wall on man (take g = 10 m/s/s)



| 65. | If the v<br>(A)              | velocity of C.M of a rolling body is V, then v<br>$\sqrt{2}$ V   | elocity<br>(B)              | y of highest point in the body will be<br>V                                   |
|-----|------------------------------|--|-----------------------------|---|
|     | (C)                          | 2V   | (D)                         | $V/\sqrt{2}$  |
| 66. | The ar of thei               | ngular momentum of two rotating bodies are or rotational K.E is  | equal.                      | If the ratio of their M.I is 1:4, the ratio                                   |
|     | (A)                          | 1:2  | (B)                         | 2:1   |
|     | (C)                          | 1:4  | (D)                         | 4:1   |
| 67. | The le<br>/s is (ta          | vel of water in a tank is 5m. A hole $1 \text{ cm}^2$ is a tank $g=10 \text{ m/s/s}$   | made a                      | at the bottom. The rate of leakage in m <sup>3</sup>                          |
|     | (A)                          | 10-3   | (B)                         | $10^{-4}$   |
|     | (C)                          | 10   | (D)                         | 10-2  |
| 68. | Two b<br>3/5 <sup>th</sup> o | locks A and B float in water. A floats with 1/<br>f its volume immersed. The ratio of their den                                      | 4 <sup>th</sup> of sities i | its volume immersed and B floats with is                                      |
|     | (A)                          | 5:12   | (B)                         | 12:5  |
|     | (C)                          | 3:20   | (D)                         | 20:3  |
| 69. | The te liquid                | rminal velocity of a spherical ball of lead of r<br>varies with R such that  | radius                      | R is V while falling through a viscous  |
|     | (A)                          | V/R is constant  | (B)                         | VR is constant  |
|     | (C)                          | V is constant  | (D)                         | V/R <sup>2</sup> is constant  |
| 70. | A hydrother p<br>(A)         | raulic press uses a piston of 100 cm <sup>2</sup> to exert a<br>piston that supports a mass of 2000 kg is (take 100cm <sup>2</sup> ) | a force<br>e g = 1<br>(B)   | $c of 10^7 dynes on water. The area of the 0m/s/s)10^9 cm^2$                  |
|     | (C)                          | $2 \times 10^4 \text{ cm}^2$   | (D)                         | $2 \times 10^{10} \text{ cm}^2$   |
| 71. | When<br>throug<br>The vo     | kerosene and coconut oil of co eff. of viscosi<br>h the same pipe, under same pressure differe<br>blume of kerosene that flows is    | ity 0.0<br>nce an           | 02 and 0.0154 $Ns/m^2$ are allowed d same time collects 1 lit of coconut oil. |
|     | (A)                          | 5.5 lit  | (B)                         | 6.6 lit   |
|     | (C)                          | 7.7 lit  | (D)                         | 8.8 lit   |
| 72. | There                        | is a circular hole in metal plate. When the pla  | ate is h                    | neated the radius of the hole becomes   |
|     | (A)                          | increased  | (B)                         | decreased   |
|     | (C)                          | unchanged  | (D)                         | depends on metal  |
| 73. | Specif<br>given              | ic heat of a substance depends on 1. Nature of substance   | of subs                     | tance. 2. Mass of substance. 3. Heat  |
|     | (A)                          | Only 1is correct   | (B)                         | Both 1 and 2 are correct  |
|     | (C)                          | All are correct  | (D)                         | Only 1 and 3 are correct  |
| 74. | In a gi                      | ve process dW=0, dq is <0 then for a gas   |                             |   |
|     | (A)                          | Temperature increases  | (B)                         | Volume decreases  |
|     | (C)                          | Pressure increases   | (D)                         | Pressure decreases  |
| 75. | The ef                       | ficiency of carnot engine depends on   |                             |   |
|     | (A)                          | Working substance  | (B)                         | Sink temperature  |
|     | (C)                          | Source temperature   | (D)                         | Both B and C  |
|     |                              |  |                             |   |

76. A 200 turn coil of self inductance 30 mH carries a current of 5 mA. Find the magnetic flux linked with each turn of coil.

| (A) | 7.5 x 10 <sup>-7</sup> Wb | (B) | 1.6 x 10 <sup>-7</sup> Wb |
|-----|---------------------------|-----|---------------------------|
| (C) | 3 x 10 <sup>-7</sup> Wb   | (D) | 1.5 x 10 <sup>-7</sup> Wb |

77. The instantaneous value of current in an AC circuit is I = 2 sin (100  $\pi$  t +  $\pi/3$ ) A. At what first time, the current will be maximum?

| (A) | 1/100 s | (B) | 1/200 s |
|-----|---------|-----|---------|
| (C) | 1/500 s | (D) | 1 s     |

| 78. | What in electric system represents force | in mechanical system? |
|-----|--|-----------------------|
|     |  |                       |

| (A) | L   | (B) I |
|-----|-----|-------|
| (C) | 1/C | (D) q |

79. A capacitor of 1  $\mu$ F is charged with 0.01C of electricity. How much energy is stored in it?

| (A) | 30J | (B) | 40J |
|-----|-----|-----|-----|
| (C) | 50J | (D) | 60J |

80. An electromagnetic wave is travelling in vacuum with a speed of  $3 \times 10^8$  m/s. Find the velocity in a medium having relative electric and magnetic permeability 2 and 1, respectively.

| (A) | $3/\sqrt{2} \times 10^8 \text{m/s}$ | - | - | (B) | $1.5 \ge 10^8 \text{m/s}$ |
|-----|-------------------------------------|---|---|-----|---------------------------|
| (C) | $2 \ge 10^8 \text{m/s}$             |   |   | (D) | No change                 |

81. Trace the path of a ray of light passing through a glass prism as shown in the figure. If the refractive index of glass is  $\sqrt{3}$ , find out the value of angle of emergence from prism.

| (A) | 30 | (B) 45 |
|-----|----|--------|
| (C) | 60 | (D) 75 |

82. Light wave from two coherent sources of intensities in ratio 64:1 produces interference. Calculate the ratio of maxima and minima of the interference pattern.

| (A) | 8:1 | (B) | 64:1  |
|-----|-----|-----|-------|
| (C) | 9:7 | (D) | 81:49 |

83. In young's experiment, the width of the fringes obtained with light of wavelength  $6000 \text{ A}^0$  is 2 mm. What will be the fringe width, if the entire apparatus is immersed in a liquid of refractive index 1.33?

| (A) | 1 mm | (B) | 1.5 mm |
|-----|------|-----|--------|
| (C) | 2 mm | (D) | 2.5 mm |

84. Unpolarised light is incident on plane glass surface. What should be the angle of incidence in degrees, so that the reflected and refracted rays are perpendicular to each other?

| (A)            | 37 | (B) | ) 47 |
|----------------|----|-----|------|
| $(\mathbf{O})$ |    |     |      |

(C) 57 (D) 67

85. Determine the de-Broglie wavelength associated with an electron, accelerated through a potential difference of 100 V.

| (A) | $1.227A^{0}$ | (B) | $12.27A^{0}$ |
|-----|--------------|-----|--------------|
| (C) | $122.7A^{0}$ | (D) | $1227A^{0}$  |

86. A particle with rest mass  $m_0$  is moving with velocity c. What is the de-Broglie wavelength associated with it?

| (A) | infinity   | (B) | zero  |
|-----|------------|-----|-------|
| (C) | radio wave | (D) | X ray |

## 87. Which among the following series gives visible light?

- (A) Lyman (B) Balmer
- (C) Bracket (D) None of these
- 88. Identify the logic operation performed by this circuit



89. The number of silicon atoms per m<sup>3</sup> is 5 x  $10^{28}$ . This is doped simultaneously with 5 x  $10^{22}$  atoms per m<sup>3</sup> of arsenic and 5 x  $10^{20}$  atoms per m<sup>3</sup> of indium. Calculate the number of holes, given that  $n_i = 1.5 \times 10^{16} \text{ m}^{-3}$ .

| (A) | $4.54 \ge 10^9 \text{m}^{-3}$   | (B) | $4.95 \ge 10^{22} \text{m}^{-3}$ |
|-----|---------------------------------|-----|----------------------------------|
| (C) | $1.5 \ge 10^{16} \text{m}^{-3}$ | (D) | $5 \ge 10^{28} \text{m}^{-3}$    |

90. Two charges  $+5\mu C$  and  $-5\mu C$  are placed 5 mm apart. Determine E at a point 10 cm from centre on the positive charge side along the axial line.

| (A) | $4.5 \ge 10^{5} \text{N/C}$ | (B) | $4.5 \times 10^{5} NC$    |
|-----|-----------------------------|-----|---------------------------|
| (C) | 4.5 x 10 <sup>-5</sup> N/C  | (D) | 4.5 x 10 <sup>-5</sup> NC |

91. If the Gaussian surface is so chosen that there are some charges inside and some outside then the electric field is due to

| (A) Only inside charges | (B) | Only outside charges |
|-------------------------|-----|----------------------|
|-------------------------|-----|----------------------|

(C) All the charges (D) Cannot determine

92. The following is a diagram showing the variation of E with r from centre of uniformly charge spherical shell of radius R



93. Net capacitance of 3 identical capacitor in series is  $1\mu F$ . What is the net capacitance in  $\mu F$  if connected in parallel?

| (A) | 3 | (B) | 6  |
|-----|---|-----|----|
| (C) | 9 | (D) | 12 |

94. An inductor of 5H carries a steady current of 2A. In what time if the current is made zero can a 40V self induced emf be produced in the inductor.

| (A) | 2s   | (B) | 1s    |
|-----|------|-----|-------|
| (C) | 0.5s | (D) | 0.25s |

95. A cell of emf E and internal resistance r gives 0.5A with R=12 ohms and 0.25 with R = 25 ohms. Its internal resistance in ohms will be

| (A) | 0.5 | (B) | 1 |
|-----|-----|-----|---|
| (C) | 2   | (D) | 3 |

96.



| 97.  | Two identical circular loops P and Q of radius r are placed in parallel planes with same axis at a distance of 2r. Find B at the midpoint of the axis between them if same current I flows through both loops.                                      |  |                        |   |
|------|---|--|------------------------|---|
|      | (A)<br>(C)  | $\mu_0 I/2^{3/2} r$<br>$\mu_0 I/4\pi r$  | (B)<br>(D)             | $\mu_0 2 I/2^{3/2} r$<br>Cannot be determined   |
| 98.  | A block of mass 4 kg is kept on a rough horizontal surface. The coefficient of static friction is 0.8. If a force of 19 N is applied on the block parallel to the floor, then the force of friction between the block and floor is:<br>(A) $= 10$ N |  |                        |   |
|      | (A) $(C)$   | 19N<br>16N   | (D)                    | 9.8N  |
| 99.  | Curre<br>(A)<br>(C)   | nt in a circuit falls steadily from 2A to 0A in<br>1H<br>3H  | 10 ms<br>(B)<br>(D)    | . Calculate L if emf induced is 200V.<br>2H<br>4H   |
| 100. | Self in<br>core.<br>(A)   | nductance of the air core inductor increases fi<br>What is the relative permeability of the core u<br>500  | rom 0.<br>used?<br>(B) | 01 mH to 10 mH on introducing an iron 800   |
|      | (C)   | 900  | (D)                    | 1000  |
| 101. | Amor<br>(A)<br>(C)  | ing the following, the most stable complex is<br>$[Fe(H_2O)_6]^{3+}$<br>$[Fe(C_2O_4)_3]^{3-}$  | (B)<br>(D)             | $[Fe(NH_3)_6]^{3+}$<br>$[Fe(Cl)_6]^{3-}$  |
| 102. | Which<br>metal<br>(A)   | h is the correct coordination number (C.N) an<br>atom in $[Co(NH_3)_2(H_2O)_2Cl_2]^+$ ?<br>C.N=3, O.N=+1   | d oxic                 | lation number (O.N) of the transition<br>C.N=4, O.N=+2  |
|      | (C)   | C.N=6, O.N=+1  | (D)                    | C.N=6, O.N=+3   |
| 103. | In a section<br>(A)<br>(C)  | olid, oxide ions are arranged in ccp, cations A<br>a B occupy one third of the octahedral voids.<br>ABO <sub>3</sub><br>AB <sub>3</sub> O  | The fo<br>(B)<br>(D)   | py one sixth of the tetrahedral voids and<br>ormula of the solid is:<br>A <sub>3</sub> BO<br>A <sub>3</sub> B <sub>3</sub> O <sub>3</sub>   |
| 104. | On m  | ixing acetone to methanol some of the hydrog   | gen bo                 | nds between methanol molecules break.   |
|      | Which<br>(A)  | h of the following statements is correct about<br>At specific composition methanol acetone<br>mixture will form minimum boiling<br>azeotrope and show positive deviation<br>from Raoult's law  | the at (B)             | At specific composition methanol<br>acetone mixture will form maximum<br>boiling azeotrope and show positive<br>deviation from Raoult's law |
|      | (C)   | At specific composition methanol acetone<br>mixture will form minimum boiling<br>azeotrope and show negative deviation<br>from Raoult's law  | (D)                    | At specific composition methanol<br>acetone mixture will form maximum<br>boiling azeotrope and show negative<br>deviation from Raoult's law |
| 105. | $K_{\rm H}$ value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10 <sup>-5</sup> and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is:                |  |                        |   |
|      | (A)   | formaldehyde <methane<carbon< td=""><td>(B)</td><td>formaldehyde&lt; carbon dioxide</td></methane<carbon<>   | (B)                    | formaldehyde< carbon dioxide  |
|      | (C)   | argon <carbon dioxide<<br="">methane<formaldehyde< td=""><td>(D)</td><td>argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane></td></formaldehyde<></carbon> | (D)                    | argon <methane <carbon="" dioxide<br=""><formaldehyde< td=""></formaldehyde<></methane>   |
| 106. | The number of faradays of electricity required for electrolytic conversion of the mole of nitrobenzene to aniline is:  |                       |  |  |  |  |  |  |  |  |
|------|--|-----------------------|--|--|--|--|--|--|--|--|
|      | (A) 3F (B) 4F<br>(C) 6F (D) 5F   |                       |  |  |  |  |  |  |  |  |
| 107. | The positive value of the standard electrode potential of Ag <sup>+</sup> /Ag indicates that:  |                       |  |  |  |  |  |  |  |  |
|      | <ul> <li>(A) This redox couple is a stronger reducing agent than H<sup>+</sup>/H<sub>2</sub> couple</li> <li>(B) This redox couple is a stronger oxidizing agent than H<sup>+</sup>/H<sub>2</sub> couple</li> <li>(C) Ag can displace H<sub>2</sub> from acid</li> <li>(D) Ag can displace H<sub>2</sub> from base</li> </ul>  | ole                   |  |  |  |  |  |  |  |  |
| 108. | Milk is refrigerated in order to slow the rate of decomposition by bacterial action. The decr  | ease in               |  |  |  |  |  |  |  |  |
|      | reaction rate is due to:(B)A decrease in $\triangle$ H for the reaction of an alternative possessing sufficient energy(A)A decrease in surface area(B)A decrease in $\triangle$ H for the reaction of an alternative pathway with greater activation of a alternative pathway with greater ac | etion<br>e<br>energy. |  |  |  |  |  |  |  |  |
| 109. | <ul> <li>Which of the following statements is not correct?</li> <li>(A) The rate of a reaction decreases with passage of time as concentration of reactants decrease</li> <li>(B) The instantaneous rate a reaction same at any time during the reactants decrease</li> </ul>  | is<br>tion            |  |  |  |  |  |  |  |  |
|      | <ul> <li>(C) For a zero order reaction the concentration of reactants remains changed with passage of time</li> <li>(D) The rate of a reaction decreases increase in concentration of reactants remains</li> </ul>   | with<br>tant (s)      |  |  |  |  |  |  |  |  |
| 110. | Which of the following gases shows the lowest adsorption per gram of charcoal? The critic temperatures are given in parenthesis:   | al                    |  |  |  |  |  |  |  |  |
|      | (A) $H_2(33K)$ (B) $CH_4(190K)$<br>(C) $SO_2(630K)$ (D) $CO_2(304K)$   |                       |  |  |  |  |  |  |  |  |
| 111. | <ul> <li>Freundlich adsorption isotherm is given by the expression x/m=kp<sup>1/n</sup>. Which of the following statements are false?</li> <li>i. When 1/n=0, the adsorption is independent of pressure.</li> <li>ii. When n=0, the plot of x/m vs p graph is a line parallel to x axis.</li> <li>iii. When 1/n=0, the adsorption is directly proportional to pressure.</li> <li>iv. When n=0, plot of x/m vs p is a curve</li> </ul>  | ng                    |  |  |  |  |  |  |  |  |
|      | (A) i and ii(B) ii and iv(C) i and iii(D) all are false  |                       |  |  |  |  |  |  |  |  |
| 112. | In the extraction of chlorine by electrolysis of an aqueous solution of sodium chloride, whi<br>the following statements are true?<br>i. $\triangle G^0$ for the overall reaction is positive<br>ii. $\triangle G^0$ for the overall reaction is negative<br>iii. $E^0$ for the overall reaction is positive<br>iv. $E^0$ for the overall reaction is negative   | ch of                 |  |  |  |  |  |  |  |  |
|      | (A)1 and iv(B)i and iii(C)ii and iii(D)iii and iv  |                       |  |  |  |  |  |  |  |  |
| 113. | Which of the following pairs of ions are isoelectronic and isostructural ?<br>(A) $NO_2^+$ and $NO_3^-$ (B) $ClO_3^-$ and $ICl_4^-$<br>(C) $XeO_3^{2^-}$ and $PCl_3$ (D) $ClO_3^-$ and $SO_3^{2^-}$  |                       |  |  |  |  |  |  |  |  |

| 114. | Which  | n of the following hydrides is the strongest re-   | ducing   | g agent?                                     |  |  |  |  |  |  |  |  |
|------|--|--|--|--|--|--|--|--|--|--|--|--|
|      | (A)  | NH <sub>3</sub>  | (B)  | PH <sub>3</sub>                              |  |  |  |  |  |  |  |  |
|      | (C)  | AsH <sub>3</sub>   | (D)  | SbH <sub>3</sub>                             |  |  |  |  |  |  |  |  |
| 115. | Consider the reactions,  |  |  |  |  |  |  |  |  |  |  |  |
|      | 1.<br>;;   | $Zn + Conc. HNO_3 (hot) \longrightarrow Zn (N)$<br>$Zn + dil HNO_2 (cold) \longrightarrow Zn (N)$                                | $ O_3 _2 +  O_3 _2 =  O_3$ | $-X + H_2O$<br>+ X + H_2O                    |  |  |  |  |  |  |  |  |
|      | 11. $\Sigma_{II} + UII. \Pi_{INO_3} (COIU) \longrightarrow \Sigma_{II} (INO_3)_2 + Y + H_2O$<br>Compounds X and Y are respectively   |  |  |  |  |  |  |  |  |  |  |  |
|      | (A)  | N <sub>2</sub> O, NO   | (B)  | NO <sub>2</sub> , NO <sub>2</sub>            |  |  |  |  |  |  |  |  |
|      | (C)  | $N_2, N_2O$  | (D)  | NO <sub>2</sub> , NO                         |  |  |  |  |  |  |  |  |
| 116. | When manga   | KMnO <sub>4</sub> acts as an oxidizing agent in weakly anese decreases by:   | alkali   | ine medium, the oxidation number of          |  |  |  |  |  |  |  |  |
|      | (A)  | 1  | (B)  | 2  |  |  |  |  |  |  |  |  |
|      | (C)  | 3  | (D)  | 5  |  |  |  |  |  |  |  |  |
| 117. | Acidif<br>forma  | Acidified potassium dichromate solution turns green when Na <sub>2</sub> SO <sub>3</sub> is added to it due to the formation of: |  |  |  |  |  |  |  |  |  |  |
|      | (A)  | $CrSO_4$   | (B)  | $Cr_2(SO_4)_3$                               |  |  |  |  |  |  |  |  |
|      | (C)  | CrO <sub>4</sub> <sup>2</sup>  | (D)  | $\operatorname{Cr}_2(\operatorname{SO}_3)_3$ |  |  |  |  |  |  |  |  |
| 118. | The d-electron configurations of $Cr^{2+}$ , $Mn^{2+}$ , $Fe^{2+}$ and $Co^{2+}$ are $d^4$ , $d^5$ , $d^6$ and $d'$ , respectively.<br>Which one of the following complexes will exhibit minimum paramagnetic behavior? (atomic numbers of Cr=24, Mn=25, Fe=26, Co=27) |  |  |  |  |  |  |  |  |  |  |  |
|      | (A)  | $[Cr(H_2O)_6]^{2+}$  | (B)  | $[Mn(H_2O)_6]^{2+}$                          |  |  |  |  |  |  |  |  |
|      | (C)  | $[Fe(H_2O)_6]^{2+}$  | (D)  | $[Co(H_2O)_6]^{2+}$                          |  |  |  |  |  |  |  |  |
| 119. | When is:   | 2-Bromopentane is heated with potassium et   | hoxid  | e in ethanol, the major product obtained     |  |  |  |  |  |  |  |  |
|      | (A)  | 2-Ethoxypentane  | (B)  | Pent-1-ene                                   |  |  |  |  |  |  |  |  |
|      | (C)  | Cis-Pent-2-ene   | (D)  | Trans-Pent-2-ene                             |  |  |  |  |  |  |  |  |
| 120. | Which  | n of the following undergoes nucleophilic sub  | stituti  | on exclusively by $S_N^1$ mechnism?          |  |  |  |  |  |  |  |  |
|      | (A)  | Chlorothane  | (B)  | Isopropyl chloride                           |  |  |  |  |  |  |  |  |
|      | (C)  | Chlorobenzene  | (D)  | Benzyl chloride                              |  |  |  |  |  |  |  |  |
| 121. | The $n$  | umber of possible stereoisomers for CH <sub>3</sub> CH=  | CHCl   | $H_2$ CH(Br)CH <sub>3</sub> is:              |  |  |  |  |  |  |  |  |
|      | (A)  | 8<br>4   | (B)<br>(D)   | 2  |  |  |  |  |  |  |  |  |
| 100  | $(\mathbf{C})$   | т<br>1   | (D)  |  |  |  |  |  |  |  |  |  |
| 122. | 2-Met  | Methanol and sec-propyl iodide   | oduce<br>(B)   | s:<br>Methyl iodide and tert-butyl alcohol   |  |  |  |  |  |  |  |  |
|      | $(\mathbf{C})$   | Methyl iodide and isobutene  | (D)  | Methanol and tet-butyl iodide                |  |  |  |  |  |  |  |  |
| 123  | The le   | east acidic compound among the following is:   |  | 2  |  |  |  |  |  |  |  |  |
| 125. | (A)  | o-Nitrophenol  | (B)  | m-Nitrophenol                                |  |  |  |  |  |  |  |  |
|      | (C)  | p-Nitrophenol  | (D)  | Phenol                                       |  |  |  |  |  |  |  |  |
| 124. | An all<br>The ke   | kene $C_7H_{14}$ on reductive ozonolysis gives an a etone is:  | aldehy   | de with formula $C_3H_6O$ and a ketone.      |  |  |  |  |  |  |  |  |
|      | (A)  | 2-Butanone   | (B)  | 2-Pentanone                                  |  |  |  |  |  |  |  |  |
|      | (C)  | 3-Pentanone  | (D)  | Propanone                                    |  |  |  |  |  |  |  |  |
| 125. | The in Acetor  | ncreasing order of the rate of addition of HCN<br>ne iii) Acetophenone iv) benzophenone  | to the   | e compounds i) Formaldehyde ii)              |  |  |  |  |  |  |  |  |
|      | (A)  | i <ii <="" iii="" iv<="" td=""><td>(B)</td><td>iv&lt; ii&lt; iii &lt; i</td></ii>  | (B)  | iv< ii< iii < i                              |  |  |  |  |  |  |  |  |
|      | (C)  | 1V<111< 11< 1  | (D)  | 1V< 1< 11< 111                               |  |  |  |  |  |  |  |  |

| (A) CH <sub>2</sub> COOH (B) (CH <sub>3</sub> ) <sub>2</sub> CHCOOH<br>(C) CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH (D) (CH <sub>3</sub> ) <sub>2</sub> CCOOH<br>127. $C_{2H_3}NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y \xrightarrow{NH_3} (excess) Z.$<br>In the above sequence, Z is:<br>(A) cyanoethane (B) ethanamide<br>(C) methanamine (D) ethanamine<br>(C) methanamine (D) ethanamine<br>(A) $-SO_3H$ (B) $-OH$<br>(C) $-F$ (D) $-Br$<br>129. Which of the following is an example of globular protein?<br>(A) $myosin$ (B) collagen<br>(C) keratin (D) haemoglobin<br>130. Which one of the following is synthesized in our body by sun rays?<br>(A) Vitamin D (B) Vitamin B<br>(C) Vitamin K (D) Vitamin A<br>131. Caprolactum is the is the starting material for the synthesis of<br>(A) Nylon-6 (B) Nylon 10<br>132. The species which can serve as an initiator for cationic polymerization is<br>(A) Lifthium aluminium hydride (B) Nitric acid<br>(C) Aluminium enhoride (D) BuLi<br>133. Aspirin is an:<br>(A) analgesic (B) antipyretic<br>(C) antimalarial (D) Both analgesic and antipyretic<br>(C) antimalarial (D) Both analgesic and antipyretic<br>(C) Same as atomic mass (D) One fourth of its atomic mass<br>(C) Same as atomic mass (D) One fourth of its atomic mass<br>135. Which of the following stof quantum numbers is correct for an electron in 4f subshell?<br>(A) $n^{-4}, 1^{-3}, m^{-4}, s = +1/2$ (D) $n=3, 1^{-2}, m=-2, s = +1/2$<br>136. The correct sequence of atomic radii is:<br>(A) $Na^{-M}G^{-A} > Si (B) Al > Si > Na > Mg (C) Si > Al > Ma > Mg > Na (D) Si > Al > Si > Na > Mg (C) Si > Al > Ma > Mg > Na (D) Si > Al > Na > Mg (C) Si > Al > Ma > Mg > Na (D) Si > Al > Na > Mg (C) PCl3 (D) NgH4 (B) NH5 (C) PF5 (D) NgH4$ | 126. | The c            | arboxylic acid that does not undergo Hell-V                  | ohlard-2             | Zelinsky reaction is:                   |
|--|------|------------------|--|----------------------|---|
| (C)CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH(D)(CH <sub>3</sub> ) <sub>5</sub> CCOOH127.C <sub>2</sub> H <sub>3</sub> NH <sub>2</sub> NaNo <sub>2</sub> /HeI XP/Br <sub>2</sub> YMH <sub>3</sub><br>(excess)Z.In the above sequence, Z is:<br>(A)(A)(B)ethanamide(D)ethanamide(C)methanamine(D)(D)-Banamide(D)ethanamine128.The attachment of which of the following group at para position in aniline will raise the K <sub>v</sub><br>value?<br>(A)-SO <sub>3</sub> H(B)-OH(C)-F(D)-Br129.Which of the following is an example of globular protein?<br>(A)<br>myosin(B)collagen<br>(C)(C)keratin(D)-Ba130.Which one of the following is synthesized in our body by sun rays?<br>(A)Vitamin D(B)(C)Vitamin K(D)Vitamin A131.Caprolactum is the is the starting material for the synthesis of<br>(C)(A)Nylon-6.<br>(C)(B)Nylon6.6<br>(C)(C)The species which can serve as an initiator for cationic polymerization is<br>(A)Lithium aluminum hydride(B)Nitric acid<br>(C)(D)Bul.i133.Aspirin is an:<br>(A)<br>analgesic(B)antipyretic(A)Half of its atomic mass(B)net al of its atomic mass(C)Same as atomic mass(D)One fourth of its atomic mass(S)Maio fits atomic mass(D)One fourth of its atomic mass(C)Same as atomic mass(D)One fourth of its atomic mass(C)Same as atomic ma   |      | (A)              | CH <sub>3</sub> COOH   | (B)                  | $(CH_3)_2$ CHCOOH                       |
| 127.       C <sub>2</sub> H <sub>2</sub> NH <sub>2</sub> NaNO <sub>2</sub> /HCl X       P/Br <sub>2</sub> Y       Y       → (excess) Z.         In the above sequence, Z is:       (A) cyanoethane       (B) ethanamide         (C) methanamine       (D) ethanamine         128.       The attachment of which of the following group at para position in aniline will raise the K <sub>b</sub> value?         (A) -SO <sub>3</sub> H       (B) -OH         (C) -F       (D) -Br         129.       Which of the following is an example of globular protein?         (A) myosin       (B) collagen         (C) keratin       (D) haemoglobin         130.       Which one of the following is synthesized in our body by sun rays?         (A) Vitamin D       (B) Vitamin A         131.       Caprolactum is the is the starting material for the synthesis of         (A) Nylon-6       (B) Nylon 6.6         (C) Terylene       (D) Witric acid         (C) Aluminium chloride       (D) BuLi         133.       Aspirin is an:         (A) analgesic       (B) antipyretic         (C) Aluminium chloride       (D) BuLi         133.       Aspirin is an:         (A) analgesic       (B) antipyretic         (C) Aluminium chloride       (D) Both analgesic and antipyretic         (C) Same as atomic mass       (D) One fourth of its atomic m   |      | (C)              | CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> COOH         | (D)                  | (CH <sub>3</sub> ) <sub>3</sub> CCOOH   |
| In the above sequence, Z is:<br>(A) cyanoethane (B) ethanamide<br>(C) methanamine (D) ethanamine<br>128. The attachment of which of the following group at para position in aniline will raise the K <sub>b</sub><br>value?<br>(A) $-SO_3H$ (B) $-OH$<br>(C) $-F$ (D) $-Br$<br>129. Which of the following is an example of globular protein?<br>(A) myosin (B) collagen<br>(C) keratin (D) haemoglobin<br>130. Which one of the following is synthesized in our body by sun rays?<br>(A) Vitamin D (B) Vitamin B<br>(C) Vitamin K (D) Vitamin A<br>131. Caprolactum is the is the starting material for the synthesis of<br>(A) Nylon-6 (B) Nylon 6,6<br>(C) Terylene (D) Nylon 10<br>132. The species which can serve as an initiator for cationic polymerization is<br>(A) Lithium aluminium hydride (B) Nitric acid<br>(C) Aluminium chloride (D) BuLi<br>133. Aspirin is an:<br>(A) analgesic (B) antipyretic<br>(C) antimalarial (D) Both analgesic and antipyretic<br>(C) Same as atomic mass (D) One fourth of its atomic mass<br>(C) Same as atomic mass (D) One fourth of its atomic mass<br>(C) Same as atomic mass (D) One fourth of its atomic mass<br>135. Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A) $n=4, l=3, m=+1, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$<br>(C) $n=4, l=3, m=+1, s=+1/2$ (D) $n=3, l=2, m=-2, s=+1/2$<br>136. The correct sequence of atomic radii is:<br>(A) $Na^3Mg>Al>Si$ (B) $Al>Si>Na>Mg$<br>137. In which of the following, the bond angle around the central atom is maximun?<br>(A) $NH_3$ (B) $NH_4^+$<br>(C) $PCl_3$ (B) $NH_5$<br>(C) $PCl_3$ (B) $NH_5$<br>(C) $PF_5$ (D) $N_2H_4$  | 127. | C <sub>2</sub> H | $I_5 NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y$ | $\xrightarrow{NH_3}$ | $\rightarrow$ Z.                        |
| (A)       cyanoethane       (B)       ethanamide         (C)       methanamine       (D)       ethanamine         128.       The attachment of which of the following group at para position in aniline will raise the K <sub>b</sub> value?         (A)       -SO <sub>3</sub> H       (B)       -OH         (C)       -F       (D)       -Br         129.       Which of the following is an example of globular protein?       (A)       myosin         (A)       myosin       (B)       collagen         (C)       keratin       (D)       haemoglobin         130.       Which one of the following is synthesized in our body by sun rays?       (A)         (A)       Vitamin D       (B)       Vitamin A         131.       Caprolactum is the is the starting material for the synthesis of       (C)         (A)       Nylon-6       (B)       Nylon6,6         (C)       Terylene       (D)       Notric acid         (C)       Terylene       (D)       Null         132.       The species which can serve as an initiator for cationic polymerization is       (A)         (A)       Lithium aluminium hydride       (B)       Null         (C)       Aspirin is an:       (A)       analgesic       (B)      <  |      | In the           | above sequence. Z is:  | (exce                | ss)                                     |
| (C)       methanamine       (D)       ethanamine         128.       The attachment of which of the following group at para position in aniline will raise the K <sub>b</sub> value?         (A)       -SO <sub>3</sub> H       (B)       -OH         (C)       -F       (D)       -Br         129.       Which of the following is an example of globular protein?       (A)       myosin       (B)       collagen         (C)       keratin       (D)       haemoglobin         130.       Which one of the following is synthesized in our body by sun rays?       (A)       Vitamin D       (B)       Vitamin B         (C)       Vitamin K       (D)       Vitamin A       (D)       Vitamin A         131.       Caprolactum is the is the starting material for the synthesis of       (C)       (C)       Treylene       (D)       Nylon 6.6         (C)       Treylene       (D)       Nylon 10       132.       The species which can serve as an initiator for cationic polymerization is         (A)       Lithium aluminium hydride       (B)       Nitric acid       (C)       Aluminium chloride       (D)       BuLi         133.       Aspirin is an:       (A)       analgesic       (B)       anatipyretic         (C)       Athalf of its atomic mass       (D)   |      | (A)              | cyanoethane  | (B)                  | ethanamide                              |
| 128.       The attachment of which of the following group at para position in aniline will raise the K <sub>b</sub> value?         (A)       -SO <sub>3</sub> H       (B)       -OH         (C)       -F       (D)       -Br         129.       Which of the following is an example of globular protein?       (A)       myosin       (B)       collagen         (C)       keratin       (D)       haemoglobin         130.       Which one of the following is synthesized in our body by sun rays?       (A)       Vitamin D       (B)       Vitamin B         (C)       Vitamin K       (D)       Vitamin A         131.       Caprolactum is the is the starting material for the synthesis of       (A)       Nylon-6       (B)       Nylon 10         132.       The species which can serve as an initiator for cationic polymerization is       (A)       Lithium aluminium hydride       (B)       Nitric acid         (C)       Auminum chloride       (D)       BuLi       133.       Aspirin is an:       (A)       analgesic       (B)       ont analgesic and antipyretic         (C)       auminum chloride       (D)       BuLi       133.       Aspirin is at an:       (A)       Half of its atomic mass       (B)       One third of its atomic mass         (C)       autimalarial       (D)  |      | (C)              | methanamine  | (D)                  | ethanamine                              |
| (A) $-SO_3H$ (B) $-OH$ (C) $-F$ (D) $-Br$ 129.Which of the following is an example of globular protein?(A)(A)myosin(B)(C)keratin(D)130.Which one of the following is synthesized in our body by sun rays?(A)Vitamin D(B)(C)Vitamin K(D)(D)Vitamin A131.Caprolactum is the is the starting material for the synthesis of(A)Nylon-6(B)(C)Terylene(D)(D)Nylon 10132.The species which can serve as an initiator for cationic polymerization is(A)Lithium aluminium hydride(B)(C)Auminium chloride(D)(D)BuLi133.Aspirin is an:(A)analgesic(B)(C)analgesic(B)(C)analgesic(B)(C)analgesic(B)(C)analgesic(B)(C)analgesic(B)(A)analgesic(B)(C)analgesic(B)(C)analgesic(B)(C)analgesic(B)(A)Half of its atomic mass(D)One third of its atomic mass(C)Sizal-ma=4, $s = +1/2$ (B)(A)n=4, $l=3, m=-4, s = +1/2$ (D)(A)n=4, $l=3, m=+1, s = +1/2$ (D)(C)n=4, $l=3, m=+1, s = +1/2$ (D)(C)Si>Al>Mg>Na(D) <td>128.</td> <td>The at value:</td> <td>ttachment of which of the following group a<br/>?</td> <td>at para p</td> <td>osition in aniline will raise the <math>K_b</math></td>  | 128. | The at value:    | ttachment of which of the following group a<br>?             | at para p            | osition in aniline will raise the $K_b$ |
| <ul> <li>(C) -F</li> <li>(D) -Br</li> <li>(A) myosin</li> <li>(B) collagen</li> <li>(C) keratin</li> <li>(D) haemoglobin</li> </ul> 130. Which one of the following is synthesized in our body by sun rays? <ul> <li>(A) Vitamin D</li> <li>(B) Vitamin B</li> <li>(C) Vitamin K</li> <li>(D) Vitamin A</li> </ul> 131. Caprolactum is the is the starting material for the synthesis of <ul> <li>(A) Nylon-6</li> <li>(B) Nylon6,6</li> <li>(C) Terylene</li> <li>(D) Nylon 10</li> </ul> 132. The species which can serve as an initiator for cationic polymerization is <ul> <li>(A) Lithium aluminium hydride</li> <li>(B) Nitric acid</li> <li>(C) Aluminium chloride</li> <li>(D) BuLi</li> </ul> 133. Aspirin is an: <ul> <li>(A) analgesic</li> <li>(C) antimalarial</li> <li>(D) Both analgesic and antipyretic</li> <li>(C) antimalarial</li> <li>(D) One fourth of its atomic mass</li> <li>(C) Same as atomic mass</li> <li>(D) One fourth of its atomic mass</li> <li>(C) n=4, 1=3, m=+1/2</li> <li>(B) n=4, 1=3, m=-4, s = -1/2</li> <li>(C) n=4, 1=3, m=+1, s = +1/2</li> <li>(D) n=3, 1=2, m=-2, s = +1/2</li> </ul> 136. The correct sequence of atomic radii is: <ul> <li>(A) Na<sup>-</sup>Mg&gt;Al&gt;Si</li> <li>(B) Al&gt;Si&gt;Na&gt;Mg</li> <li>(C) Si&gt;Al&gt;Mg&gt;Na</li> <li>(D) Si&gt;Al&gt;Na&gt;Mg</li> </ul> 137. In which of the following, the bond angle around the central atom is maximum? <ul> <li>(A) NF<sub>3</sub></li> <li>(B) NF<sub>5</sub></li> <li>(C) PF<sub>5</sub></li> <li>(D) N<sub>2</sub>H<sub>4</sub></li> </ul>  |      | (A)              | -SO <sub>3</sub> H   | (B)                  | -OH                                     |
| <ul> <li>129. Which of the following is an example of globular protein? <ul> <li>(A) myosin</li> <li>(B) collagen</li> <li>(C) keratin</li> <li>(D) haemoglobin</li> </ul> </li> <li>130. Which one of the following is synthesized in our body by sun rays? <ul> <li>(A) Vitamin D</li> <li>(B) Vitamin B</li> <li>(C) Vitamin K</li> <li>(D) Vitamin A</li> </ul> </li> <li>131. Caprolactum is the is the starting material for the synthesis of <ul> <li>(A) Nylon-6</li> <li>(B) Nylon6,6</li> <li>(C) Terylene</li> <li>(D) Nylon 10</li> </ul> </li> <li>132. The species which can serve as an initiator for cationic polymerization is <ul> <li>(A) Lithium aluminium hydride</li> <li>(B) Nitric acid</li> <li>(C) Aluminium chloride</li> <li>(D) BuLi</li> </ul> </li> <li>133. Aspirin is an: <ul> <li>(A) analgesic</li> <li>(B) antipyretic</li> <li>(C) antimalarial</li> <li>(D) Both analgesic and antipyretic</li> <li>(C) antimalarial</li> <li>(D) One fourth of its atomic mass</li> <li>(C) Same as atomic mass</li> <li>(D) One fourth of its atomic mass</li> <li>(C) n=4, l=3, m=4, s = +1/2</li> <li>(B) n=4, l=3, m=-4, s = -1/2</li> <li>(C) n=4, l=3, m=+1, s = +1/2</li> <li>(D) n=3, l=2, m=-2, s = +1/2</li> </ul> </li> <li>136. The correct sequence of atomic radii is: <ul> <li>(A) Na<sup>-</sup>Mg&gt;Al&gt;Si</li> <li>(B) Al&gt;Si&gt;Na&gt;Mg</li> </ul> </li> <li>137. In which of the following, the bond angle around the central atom is maximum? <ul> <li>(A) NH<sub>3</sub></li> <li>(B) NH<sub>4</sub><sup>+</sup></li> <li>(C) PCl<sub>3</sub></li> <li>(D) SCl<sub>2</sub></li> </ul> </li> </ul>   |      | (C)              | -F   | (D)                  | -Br                                     |
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| 131.       Caprolactum is the is the starting material for the synthesis of         (A)       Nylon-6       (B)       Nylon6,6         (C)       Terylene       (D)       Nylon 10         132.       The species which can serve as an initiator for cationic polymerization is       (A)       Lithium aluminium hydride       (B)       Nitric acid         (C)       Aluminium chloride       (D)       BuLi       133.       Aspirin is an:         (A)       analgesic       (B)       antipyretic         (C)       antimatrial       (D)       Both analgesic and antipyretic         (C)       antimatrial       (D)       Both analgesic and antipyretic         134.       The equivalent mass of iron in the reaction 2Fe + 3Cl <sub>2</sub> → 2FeCl <sub>3</sub> is:       (A)         (A)       Half of its atomic mass       (B)       One third of its atomic mass         (C)       Same as atomic mass       (D)       One fourth of its atomic mass         135.       Which of the following sets of quantum numbers is correct for an electron in 4f subshell?         (A)       n=4, l=3, m=-4, s = -1/2       (D)       n=3, l=2, m=-2, s = +1/2         136.       The correct sequence of atomic radii is:       (A)       Na>Mg>Na       (D)       Si>Al>Na>Mg       (C)       Si>Al>Mg>Na       (D) <td></td> <td>(C)</td> <td>Vitamin K</td> <td>(D)</td> <td>Vitamin A</td>   |      | (C)              | Vitamin K  | (D)                  | Vitamin A                               |
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| (C)Terylene(D)Nylon 10132.The species which can serve as an initiator for cationic polymerization is<br>(A)Lithium aluminium hydride(B)Nitric acid<br>(D)133.Aspirin is an:<br>(A)<br>analgesic(B)antipyretic<br>(D)BuLi133.Aspirin is an:<br>(A)<br>analgesic(B)antipyretic<br>(D)Both analgesic and antipyretic134.The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A)<br>Half of its atomic mass(B)One third of its atomic mass135.Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A)<br>$n=4, l=3, m=4, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$<br>(C)136.The correct sequence of atomic radii is:<br>(A)<br>$Na > Mg > Al > Si$ (B) $Al > Si > Na > Mg$<br>(C)137.In which of the following, the bond angle around the central atom is maximum?<br>(A)<br>$NH_3$<br>(C)<br>$PCl_3$ (B) $NH_4^+$<br>(C)<br>$PCl_3$ 138.Which of the following molecule does not exist<br>(A)<br>$NF_5$<br>(C)<br>$PF_5$ (B) $NF_5$<br>(D)<br>$N_2H_4$  |      | (A)              | Nylon-6  | (B)                  | Nylon6,6                                |
| <ul> <li>132. The species which can serve as an initiator for cationic polymerization is <ul> <li>(A) Lithium aluminium hydride</li> <li>(B) Nitric acid</li> <li>(C) Aluminium chloride</li> <li>(D) BuLi</li> </ul> </li> <li>133. Aspirin is an: <ul> <li>(A) analgesic</li> <li>(B) antipyretic</li> <li>(C) antimalarial</li> <li>(D) Both analgesic and antipyretic</li> </ul> </li> <li>134. The equivalent mass of iron in the reaction 2Fe + 3Cl<sub>2</sub> → 2FeCl<sub>3</sub> is: <ul> <li>(A) Half of its atomic mass</li> <li>(B) One third of its atomic mass</li> <li>(C) Same as atomic mass</li> <li>(D) One fourth of its atomic mass</li> <li>(C) n=4, l=3, m=4, s = +1/2</li> <li>(C) n=4, l=3, m=+1, s = +1/2</li> <li>(D) n=3, l=2, m=-2, s = +1/2</li> </ul> </li> <li>136. The correct sequence of atomic radii is: <ul> <li>(A) Na&gt;Mg&gt;Al&gt;Si</li> <li>(B) Al&gt;Si&gt;Na&gt;Mg</li> <li>(C) Si&gt;Al&gt;Mg&gt;Na</li> <li>(D) Si&gt;Al&gt;Na&gt;Mg</li> </ul> </li> <li>137. In which of the following, the bond angle around the central atom is maximum? <ul> <li>(A) NH<sub>3</sub></li> <li>(B) NH<sub>4</sub><sup>+</sup></li> <li>(C) PCl<sub>3</sub></li> <li>(B) NF<sub>5</sub></li> <li>(C) PF<sub>5</sub></li> <li>(D) N<sub>2</sub>H<sub>4</sub></li> </ul> </li> </ul>   |      | (C)              | Terylene   | (D)                  | Nylon 10                                |
| (A)Lithium aluminium hydride<br>(C)(B)Nitric acid<br>(D)133.Aspirin is an:<br>(A)<br>analgesic(B)antipyretic<br>(D)134.The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A)Half of its atomic mass134.The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A)Half of its atomic mass(B)One third of its atomic mass(B)(C)Same as atomic mass(D)(C)Same as atomic mass(D)(C)n=4, l=3, m=4, $s = +1/2$ (B)(A)n=4, l=3, m=4, $s = +1/2$ (B)(C)n=4, l=3, m=+1, $s = +1/2$ (D)(C)n=4, l=3, m=+1, $s = +1/2$ (D)(C)Si>Al>Mg>Na(D)Si>Al>Mg>Na(D)(C)Si>Al>Mg>Na(D)(D)Si>Al>Na>Mg(C)PCl_3(D)(A)NH_3(B)(B)NH4_+(C)PCl_3(D)(B)NF5(C)(C)PF5(D)(D)N2H4   | 132. | The sp           | pecies which can serve as an initiator for ca                | tionic po            | olymerization is                        |
| (C)Aluminium chloride(D)BuLi133.Aspirin is an:<br>(A)analgesic(B)antipyretic(C)antimalarial(D)Both analgesic and antipyretic134.The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A)Half of its atomic mass(B)(C)Same as atomic mass(B)One third of its atomic mass(C)Same as atomic mass(D)One fourth of its atomic mass(C)Same as atomic mass(D)One fourth of its atomic mass135.Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A)n=4, l=3, m=4, s = +1/2(A)n=4, l=3, m=4, s = +1/2(B)n=4, l=3, m=-4, s = -1/2(C)n=4, l=3, m=+1, s = +1/2(D)n=3, l=2, m=-2, s = +1/2136.The correct sequence of atomic radii is:<br>(A)<br>Na>Mg>Al>Si(B)Al>Si>Na>Mg(C)Si>Al>Mg>Na(D)Si>Al>Na>Mg137.In which of the following, the bond angle around the central atom is maximum?<br>(A)<br>NH3(B)NH4+*<br>(C)(C)PCl3(D)SCl2138.Which of the following molecule does not exist<br>(A)<br>NF3<br>(C)(B)NF5<br>(D)<br>N2H4  |      | (A)              | Lithium aluminium hydride                                    | (B)                  | Nitric acid                             |
| 133.Aspirin is an:<br>(A) analgesic<br>(C) antimalarial(B) antipyretic<br>(D) Both analgesic and antipyretic134.The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>  |      | (C)              | Aluminium chloride   | (D)                  | BuLi                                    |
| (A) analgesic<br>(C) antimalarial(B) antipyretic134. The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A) Half of its atomic mass<br>(C) Same as atomic mass(B) One third of its atomic mass<br>(D) One fourth of its atomic mass135. Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A) $n=4, l=3, m=4, s=+1/2$<br>(C) $n=4, l=3, m=+1, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$<br>(D) $n=3, l=2, m=-2, s=+1/2$ 136. The correct sequence of atomic radii is:<br>(A) $Na>Mg>Al>Si$<br>(C) $Si>Al>Mg>Na$ (B) $Al>Si>Na>Mg$ 137. In which of the following, the bond angle around the central atom is maximum?<br>(A) $NH_3$<br>(C) $PCl_3$ (B) $NH_4^+$<br>(C) $PCl_3$ 138. Which of the following molecule does not exist<br>(A) $NF_3$<br>(C) $PF_5$ (B) $NF_5$<br>(D) $N_2H_4$   | 133. | Aspiri           | in is an:  |                      |   |
| (C) antimalarial(D) Both analgesic and antipyretic134. The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A) Half of its atomic mass(B) One third of its atomic mass(C) Same as atomic mass(B) One fourth of its atomic mass(C) Same as atomic mass(D) One fourth of its atomic mass135. Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A) $n=4, l=3, m=4, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$<br>(C) $n=4, l=3, m=+1, s=+1/2$ (D) $n=3, l=2, m=-2, s=+1/2$ 136. The correct sequence of atomic radii is:<br>(A) $Na>Mg>Al>Si$<br>(C) $Si>Al>Mg>Na$ (B) $Al>Si>Na>Mg$ 137. In which of the following, the bond angle around the central atom is maximum?<br>(A) $NH_3$<br>(C) $PCl_3$ (B) $NH_4^+$<br>(C) $PCl_3$ (C) $PCl_3$ (B) $NF_5$<br>(C) $PF_5$ (B) $NF_5$<br>(C) $PF_5$ (D) $N_2H_4$  |      | (A)              | analgesic  | (B)                  | antipyretic                             |
| 134.The equivalent mass of iron in the reaction $2Fe + 3Cl_2 \rightarrow 2FeCl_3$ is:<br>(A) Half of its atomic mass(B) One third of its atomic mass(C) Same as atomic mass(D) One fourth of its atomic mass135.Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A) $n=4, l=3, m=4, s=+1/2$<br>(B) $n=4, l=3, m=-4, s=-1/2$<br>(C) $n=4, l=3, m=+1, s=+1/2$ 136.The correct sequence of atomic radii is:<br>(A) $Na>Mg>Al>Si$<br>(C) $Si>Al>Mg>Na$ 137.In which of the following, the bond angle around the central atom is maximum?<br>(A) $NH_3$<br>(C) $PCl_3$ 138.Which of the following molecule does not exist<br>(A) $NF_3$<br>(C) $PF_5$ 138.Which of the following molecule does not exist<br>(A) $NF_3$<br>(D) $N_2H_4$   |      | (C)              | antimalarial   | (D)                  | Both analgesic and antipyretic          |
| (A)Half of its atomic mass(B)One third of its atomic mass(C)Same as atomic mass(D)One fourth of its atomic mass135.Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A) $n=4, l=3, m=4, s=+1/2$ (B)(A) $n=4, l=3, m=4, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$<br>(C) $n=4, l=3, m=+1, s=+1/2$ (B) $n=4, l=3, m=+1, s=+1/2$ (D) $n=3, l=2, m=-2, s=+1/2$ 136.The correct sequence of atomic radii is:<br>(A)Na>Mg>Al>Si(B)(C)Si>Al>Mg>Na(D)Si>Al>Na>Mg137.In which of the following, the bond angle around the central atom is maximum?<br>(A)NH3<br>(B)NH4^+<br>(C)(C)PCl3(D)SCl2138.Which of the following molecule does not exist<br>(A)NF3<br>(C)(B)NF5<br>(C)(C)PF5(D)N2H4   | 134. | The e            | quivalent mass of iron in the reaction 2Fe +                 | $-3Cl_2 \rightarrow$ | 2FeCl <sub>3</sub> is:                  |
| (C)Same as atomic mass(D)One fourth of its atomic mass135.Which of the following sets of quantum numbers is correct for an electron in 4f subshell?<br>(A) $n=4, l=3, m=4, s=+1/2$<br>(C) $n=4, l=3, m=+1, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$<br>(D)136.The correct sequence of atomic radii is:<br>(A)<br>Na>Mg>Al>Si<br>(C)(B)Al>Si>Na>Mg<br>(D)137.In which of the following, the bond angle around the central atom is maximum?<br>(A)<br>NH3<br>(C)PCl3(B)138.Which of the following molecule does not exist<br>(A)<br>NF3<br>(C)(B)NF5<br>(D)<br>N2H4  |      | (A)              | Half of its atomic mass                                      | (B)                  | One third of its atomic mass            |
| <ul> <li>135. Which of the following sets of quantum numbers is correct for an electron in 4f subshell? <ul> <li>(A) n=4, l=3, m=4, s = +1/2</li> <li>(B) n=4, l=3, m=-4, s = -1/2</li> <li>(C) n=4, l=3, m=+1, s = +1/2</li> <li>(D) n=3, l=2, m=-2, s = +1/2</li> </ul> </li> <li>136. The correct sequence of atomic radii is: <ul> <li>(A) Na&gt;Mg&gt;Al&gt;Si</li> <li>(B) Al&gt;Si&gt;Na&gt;Mg</li> <li>(C) Si&gt;Al&gt;Mg&gt;Na</li> <li>(D) Si&gt;Al&gt;Na&gt;Mg</li> </ul> </li> <li>137. In which of the following, the bond angle around the central atom is maximum? <ul> <li>(A) NH<sub>3</sub></li> <li>(B) NH<sub>4</sub><sup>+</sup></li> <li>(C) PCl<sub>3</sub></li> <li>(B) NH<sub>4</sub><sup>+</sup></li> <li>(C) PCl<sub>3</sub></li> <li>(B) NF<sub>5</sub></li> <li>(C) PF<sub>5</sub></li> <li>(D) N<sub>2</sub>H<sub>4</sub></li> </ul> </li> </ul>   |      | (C)              | Same as atomic mass  | (D)                  | One fourth of its atomic mass           |
| (A) $n=4, l=3, m=4, s=+1/2$ (B) $n=4, l=3, m=-4, s=-1/2$ (C) $n=4, l=3, m=+1, s=+1/2$ (D) $n=3, l=2, m=-2, s=+1/2$ 136.The correct sequence of atomic radii is:<br>(A)Na>Mg>Al>Si(B)Al>Si>Na>Mg(C)Si>Al>Mg>Na(D)Si>Al>Na>Mg137.In which of the following, the bond angle around the central atom is maximum?<br>(A)NH3(B)NH4^+<br>(C)(C)PCl3(D)SCl2138.Which of the following molecule does not exist<br>(A)NF3(B)NF5<br>(C)(A)NF3(B)NF4   | 135. | Whicl            | n of the following sets of quantum numbers                   | is corre             | ct for an electron in 4f subshell?      |
| (C) $n=4, l=3, m=+1, s=+1/2$ (D) $n=3, l=2, m=-2, s=+1/2$ 136.The correct sequence of atomic radii is:<br>(A)Na>Mg>Al>Si(B)Al>Si>Na>Mg(C)Si>Al>Mg>Na(D)Si>Al>Na>Mg137.In which of the following, the bond angle around the central atom is maximum?<br>(A)NH3(B)NH4+(C)PCl3(D)SCl2138.Which of the following molecule does not exist<br>(A)NF3(B)NF5(C)PF5(D)N2H4  |      | (A)              | n=4, l=3, m=4, s = +1/2                                      | (B)                  | n=4, l=3, m=-4, s=-1/2                  |
| 136.The correct sequence of atomic radii is:<br>(A) Na>Mg>Al>Si(B) Al>Si>Na>Mg<br>(D) Si>Al>Mg(C) Si>Al>Mg>Na(D) Si>Al>Na>Mg137.In which of the following, the bond angle around the central atom is maximum?<br>(A) NH3<br>(C) PCl3(B) NH4^+<br>(D) SCl2138.Which of the following molecule does not exist<br>(A) NF3<br>(C) PF5(B) NF5<br>(D) N2H4   |      | (C)              | n=4, l=3, m=+1, s=+1/2                                       | (D)                  | n=3, $l=2$ , $m=-2$ , $s=+1/2$          |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$  | 136. | The c            | orrect sequence of atomic radii is:                          |                      |   |
| (C)Si>Al>Mg>Na(D)Si>Al>Na>Mg137.In which of the following, the bond angle around the central atom is maximum?(A)NH3(B) $NH_4^+$ (C)PCl3(D)SCl2138.Which of the following molecule does not exist(A)NF3(A)NF3(B)NF5(C)PF5(D)N2H4  |      | (A)              | Na>Mg>Al>Si  | (B)                  | Al>Si>Na>Mg                             |
| 137.In which of the following, the bond angle around the central atom is maximum?(A) $NH_3$ (B) $NH_4^+$ (C) $PCl_3$ (D) $SCl_2$ 138.Which of the following molecule does not exist(A) $NF_3$ (B) $NF_5$ (C) $PF_5$ (D) $N_2H_4$   |      | (C)              | Si>Al>Mg>Na  | (D)                  | Si>Al>Na>Mg                             |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$  | 137. | In wh            | ich of the following, the bond angle around                  | the cent             | tral atom is maximum?                   |
| $ \begin{array}{cccc} (C) & PCl_3 & (D) & SCl_2 \\ \hline 138. & Which of the following molecule does not exist \\ (A) & NF_3 & (B) & NF_5 \\ (C) & PF_5 & (D) & N_2H_4 \\ \end{array} $   |      | (A)              | NH <sub>3</sub>  | (B)                  | $\mathrm{NH_4}^+$                       |
| 138.Which of the following molecule does not exist<br>(A) $NF_3$<br>(C) $PF_5$ (B) $NF_5$<br>(D) $N_2H_4$  |      | (C)              | PCl <sub>3</sub>   | (D)                  | SCl <sub>2</sub>                        |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$  | 138. | Whicl            | n of the following molecule does not exist                   |                      |   |
| (C) $PF_5$ (D) $N_2H_4$  |      | (A)              | NF <sub>3</sub>  | (B)                  | NF <sub>5</sub>                         |
|  |      | (C)              | PF <sub>5</sub>  | (D)                  | $N_2H_4$                                |

| 139. | If helin<br>(A)<br>(C)                               | um is allowed to expand in vacuum, it liberat<br>It is an inert gas<br>Its critical temp. is low   | es hea<br>(B)<br>(D)            | t because<br>It is an ideal gas<br>It is a light gas   |
|------|--|--|---------------------------------|--|
| 140. | i) H <sub>2</sub> (g<br>reaction                     | $g) + 1/2O_2(g) \rightarrow H_2O(I) + x KJ$ ii) $H_2(g) + ons$ ,   | 1/2O <sub>2</sub>               | $(g) \rightarrow H_2O(g) + y KJ$ ; For the given two   |
|      | (A)<br>(C)   | $\begin{array}{l} x > y \\ x = y \end{array}$  | (B)<br>(D)                      | $ \begin{array}{l} x < y \\ x + y = 0 \end{array} $  |
| 141. | If the l<br>respec<br>(A)<br>(C)                     | bond dissociation energies of XY, $X_2$ , $Y_2$ (all tively and $\Delta_f H$ of XY is -200KJmol <sup>-1</sup> , the bor 400 KJmol <sup>-1</sup><br>200 KJmol <sup>-1</sup>   | diator<br>nd diss<br>(B)<br>(D) | mic molecules) are in the ratio 1:1:0.5,<br>sociation energy of $X_2$ will be:<br>300 KJmol <sup>-1</sup><br>100 KJmol <sup>-1</sup> |
| 142. | What water whet we want whet we want with a mong (A) | will be the correct order of vapour pressure o<br>g these compounds water has maximum boiling<br>Water <ether<ethanol< td=""><td>f wate<br/>ng poi<br/>(B)</td><td>r, ethanol and ether at 30°C? Given that<br/>nt and ether has minimum boiling point.<br/>Water<ethanol<ether< td=""></ethanol<ether<></td></ether<ethanol<> | f wate<br>ng poi<br>(B)         | r, ethanol and ether at 30°C? Given that<br>nt and ether has minimum boiling point.<br>Water <ethanol<ether< td=""></ethanol<ether<> |
|      | (C)  | Ether <ethanol<water< td=""><td>(D)</td><td>Ethanol<ether<water< td=""></ether<water<></td></ethanol<water<>   | (D)                             | Ethanol <ether<water< td=""></ether<water<>  |
| 143. | Which  | of the following will occur if a 0.1M solution t temperature?  | n of a                          | weak acid is diluted to 0.01M at   |
|      | (A)<br>(C)   | $[H^+]$ will decrease to 0.001M<br>Percentage ionization will increase   | (B)<br>(D)                      | pH will decrease<br>K <sub>a</sub> will increase   |
| 144. | Which<br>(A)<br>(C)                                  | of the following species involves the transfer<br>$MnO_4^{2^-} \rightarrow MnO_4^-$<br>$MnO_4^- \rightarrow MnO_2$   | r of 51<br>(B)<br>(D)           | N <sub>A</sub> electrons per mole of it ?<br>$MnO_4^- \rightarrow Mn^{2+}$<br>$CrO_4^{2-} \rightarrow Cr^{3+}$                       |
| 145. | 30-vol   | ume hyderogen peroxide means:  |                                 |  |
|      | (A)  | $30\% H_2O_2$ by volume  | (B)                             | $30g \text{ of } H_2O_2 \text{ solution containing } 1g \text{ of } it$  |
|      | (C)  | 1 cm <sup>3</sup> of solution liberates 30 cm <sup>3</sup> of $O_2$ gas at STP   | (D)                             | $30 \text{ cm}^3$ of the solution contains one mole of $H_2O_2$  |
| 146. | The co   | prrect sequence of covalent character is repres  | sented                          |  |
|      | (A)<br>(C)   | NaCl <licl< becl<sub="">2</licl<>  | (B)<br>(D)                      | BeCl <sub>2</sub> <nacl<licl< td=""></nacl<licl<>  |
| 147. | Which  | of the following is known as pyrene?   |                                 |  |
|      | (A)  | CCl <sub>4</sub><br>S-Cl <sub>2</sub>  | (B)<br>(D)                      | CS <sub>2</sub><br>Solid CO <sub>2</sub>   |
| 148. | The m  | ost stable carbocation amongst the following   | (D)<br>is:                      |  |
|      | (A)  | $(CH_3)_2CH^+$   | (B)                             | $Ph_3C^+$  |
| 149. | (C)<br>The m   | olecule that will have dipole moment is:   | (D)                             | $CH_2$ - $CH$ - $CH_2$   |
|      | (A)  | 2,2-Dimethylpropane  | (B)                             | cis-2-Butene   |
| 150  | (C)<br>Of the  | five isomeric hexanes the isomer which can   | (D)<br>give t                   | 2,2,3,3-1 etramethylbutane   |
|      | (A)  | 2-Methylpentane  | (B)                             | 2,2-Dimethylbutane   |
|      | (C)  | 2,3-Dimethylbutane   | (D)                             | n-Hexane   |
| 151. | If the lout as                                       | letters of the word SACHIN are arranged in a<br>in dictionary, then the word SACHIN appear   | ll poss<br>is at se             | sible ways and these words are written erial number  |
|      | (A)  | 601  | (B)                             | 600  |
|      | (C)  | 603  | (D)                             | 602  |

| 152. | 2. The number of ways of distributing 8 identical balls in 3 distinct boxes so that none of the boxes remain empty is                  |   |                      |  |  |  |  |  |  |  |  |  |
|------|--|---|----------------------|--|--|--|--|--|--|--|--|--|
|      | (A)<br>(C)   | 5<br>3 <sup>8</sup>   | (B)<br>(D)           | 21<br><sup>8</sup> C <sub>3</sub>                          |  |  |  |  |  |  |  |  |
| 153. | The n<br>appea   | umber of arrangements of the letters of the w r adjacently is   | ord B                | ANANA in which the two N's do not                          |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | 40<br>80  | (B)<br>(D)           | 60<br>100  |  |  |  |  |  |  |  |  |
| 154. | Numb<br>(A)<br>(C)   | per of divisors of the form $4n+2$ (n $\geq 0$ ) of the i<br>4<br>10  | nteger<br>(B)<br>(D) | 240 is<br>8<br>3   |  |  |  |  |  |  |  |  |
| 155. | 6 men<br>ways  | and 4 women are to be seated in a row so that they can be seated is   | at no t              | wo women sit together. The number of                       |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | 604800<br>120960  | (B)<br>(D)           | 17280<br>518400  |  |  |  |  |  |  |  |  |
| 156. | If the cube roots of unity are $1, \omega, \omega^3$ , then the roots of the equation $(x-1)^3 + 8 = 0$ are                            |   |                      |  |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | $-1, -1 + 2 \omega, -1 - 2 \omega^{2}$<br>-1, 1-2 $\omega, 1-2 \omega^{2}$  | (B)<br>(D)           | -1, -1, -1<br>-1, 1+2 $\omega$ , 1+2 $\omega^2$            |  |  |  |  |  |  |  |  |
| 157. | If $z_1$ and $z_2$ are two non-zero complex numbers such that $ z_1 + z_2  =  z_1  +  z_2 $ , then $\arg(z_1) - \arg(z_2)$ is equal to |   |                      |  |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | $\frac{\pi}{2}$   | (B)<br>(D)           | $-\frac{\pi}{2}$   |  |  |  |  |  |  |  |  |
| 158. | If arg (A)   | $(z) < 0$ , then arg $(-z) - \arg(z) = \pi$   | (B)                  | -π   |  |  |  |  |  |  |  |  |
|      | (C)  | $-\pi/2$  | (D)                  | $\pi/2$  |  |  |  |  |  |  |  |  |
| 159. | If ω is<br>(A)<br>(C)  | s an imaginary cube root of unity, then $(1+\omega-0.128 \omega)$<br>128 $\omega^2$   | (B)<br>(D)<br>(D)    | quals<br>-128 ω<br>-128 ω <sup>2</sup>                     |  |  |  |  |  |  |  |  |
| 160. | The pand of  | oints z1, z2, z3, z4 in the complex plane are t nly if  | he ver               | tices of a parallelogram taken in order if                 |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | $z_1 + z_4 = z_2 + z_3$<br>$z_1 + z_2 = z_3 + z_4$  | (B)<br>(D)           | z1 + z3 = z2 + z4<br>None of these                         |  |  |  |  |  |  |  |  |
| 161. | Let R<br>12}. 7  | $= \{(3,3) (6,6) (9,9) (12,12), (6,12) (3,9) (3,12) $<br>The relation is  | 2), (3,6             | (5)} be in a relation on the set $A = \{3, 6, 9, \dots\}$  |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | Reflexive and transitive<br>An equivalence relation   | (B)<br>(D)           | Reflexive only<br>Reflexive and symmetric only             |  |  |  |  |  |  |  |  |
| 162. | If a re<br>(a+y),  | al valued function $f(x)$ satisfies the functional where 'a' is a given constant and $f(0) = 1$ , the formula $f(x) = 1$ is a given constant and $f(0) = 1$ . | al equa<br>en f (2   | ation $f(x-y) = f(x) f(y) - f(a-x) f$<br>2a-x) is equal to |  |  |  |  |  |  |  |  |
|      | (A)<br>(C)   | f(x) = f(x)<br>f(x) + f(a-x)  | (D)<br>(B)           | $ \frac{f(x)}{f(-x)} $                                     |  |  |  |  |  |  |  |  |

| 163. | If the graph of the function $f(x)$ is symmetrical ab<br>(A) $f(x+2) = f(x-2)$<br>(C) $f(x) = f(-x)$   | out the<br>(B)<br>(D)      | e line x=2, then<br>f(2+x) = f(2-x)<br>f(x) = -f(-x)   |
|------|--|----------------------------|--|
| 164. | The function $f: R \rightarrow R$ defined by $f(x) = \sin x$ is<br>(A) into<br>(C) one-one   | (B)<br>(D)                 | onto<br>many-one   |
| 165. | <ul> <li>In a college of 300 students, every student reads 5 students. The number of newspapers is</li> <li>(A) At least 30</li> <li>(C) Exactly 25</li> </ul> | newsp<br>(B)<br>(D)        | At most 20<br>None of these  |
| 166. | <ul> <li>The value of a for which the sum of the squares of assume the least value is</li> <li>(A) 1</li> <li>(C) 3</li> </ul>                                 | (E)<br>(B)<br>(D)          | bots of the equation $x^2 - (a - 2) x - a - 1 = 0$<br>0<br>2   |
| 167. | If the roots of the equation $x^2 - bx + c = 0$ be two of<br>(A) $-2$<br>(C) $2$   | consec<br>(B)<br>(D)       | utive integers, then $b^2 - 4c$ equals<br>3<br>1   |
| 168. | If $(1-p)$ is a root of quadratic equation $x^2 + px + (1-p)(A) = 0, 1$<br>(C) 0, -1   | - p) =<br>(B)<br>(D)       | 0, then the roots are<br>- 1, 1<br>- 1, 2  |
| 169. | The number of real solutions of the equation $x^2 - 3$<br>(A) 2<br>(C) 1   | x +2<br>(B)<br>(D)         | =0 is/are<br>4<br>3  |
| 170. | If $x^2 + 2ax + 10 - 3a > 0$ for every real value of x,<br>(A) $a > 5$<br>(C) $-5 < a < 2$   | then<br>(B)<br>(D)         | a <- 5<br>2 < a < 5  |
| 171. | <ul> <li>The angle between two diagonals of a cube is</li> <li>(A) 45°</li> <li>(C) 90°</li> </ul>   | (B)<br>(D)                 | $60^{\circ}$ $\tan^{-1}2\sqrt{2}$  |
| 172. | If the angle between two vectors $\vec{i} + \vec{k}$ and $\vec{i} - \vec{j} + \vec{k}$<br>(A) 2<br>(C) -2  | + $a\vec{k}$<br>(B)<br>(D) | is $\pi/3$ , then the value of a is<br>4   |
| 173. | The scalar $\vec{A} \cdot (\vec{B} + \vec{C}) \times (\vec{A} + \vec{B} + \vec{C})$ equals<br>(A) 0<br>(C) $[\vec{A} \ \vec{B} \ \vec{C}]$                     | (B)<br>(D)                 | $\begin{bmatrix} \vec{A} \ \vec{B} \ \vec{C} \end{bmatrix} + \begin{bmatrix} \vec{B} \ \vec{C} \ \vec{A} \end{bmatrix}$<br>None of these |
| 174. | The points with position vectors $60\hat{i} + 3\hat{i}, 40\hat{i} - 8\hat{i}$<br>(A) $a=-40$<br>(C) $a=20$   | Bĵ, aî -<br>(B)<br>(D)     | <ul> <li>52ĵ are collinear if</li> <li>a=40</li> <li>None of these</li> </ul>  |
| 175. | <ul><li>The number of vectors of unit length perpendicula</li><li>(A) one</li><li>(C) three</li></ul>  | r to ve<br>(B)<br>(D)      | ectors $\vec{a} = (0 \ 1, \ 1)$ and $\vec{b} = (1 \ 1, \ 0)$ is<br>two<br>Infinite   |
| 176. | The angle between the lines $2x = 3y = -z$ and $6x = (A) = 0^{\circ}$<br>(C) $45^{\circ}$  | = - y =<br>(B)<br>(D)      | = -4z is<br>90°<br>30°   |

| 177. | Distance between two parallel planes $2x + y + 2z =$<br>(A) $3/2$<br>(C) $7/2$  | 8 and<br>(B)<br>(D) | 4x + 2y + 4z + 5 = 0 is<br>5/2<br>9/2    |
|------|---|---------------------|--|
| 178. | The method of least squares dictates that we choose of deviations of the points from the line is:<br>(A) Maximum          | e regre             | ession line where the sum of the square  |
|      | (C) Zero  | (D)                 | Positive                                 |
| 179. | If the value of any regression coefficient is zero, the (A) Qualitative   | en two<br>(B)       | o variables are:<br>Correlated           |
|      | (C) Dependent   | (D)                 | Independent                              |
| 180. | A process by which we estimate the value of dependent variables is called:  | dent v              | variable on the basis of one or more     |
|      | (A) Correlation<br>(C) Residual   | (B)<br>(D)          | Regression                               |
| 181. | If $A = \begin{bmatrix} 1 & -1 \end{bmatrix}$ then $A^3 =$  | (D)                 | Slope                                    |
|      | $\begin{array}{ccc} \begin{array}{c} & & & \\ & & & \\ \end{array} \\ \begin{array}{ccc} (A) & A \end{array} \end{array}$ | (B)                 | 2A                                       |
|      | (C) 3A  | (D)                 | 4A                                       |
| 182. | The value of $\begin{vmatrix} 1+x & 1 & 1 \\ 1 & 1+y & 1 \\ 1 & 1 & 1+z \end{vmatrix}$ is equal to                        |                     |  |
|      | (A) $1+x+y+z$<br>(C) $xyz$  | (B)<br>(D)          | x+y+z<br>xvz+xv+xz+vz                    |
| 183. | If $A^2 - A + I = 0$ , then the inverse of A is   | (D)                 | KJE KJ KE VE                             |
|      | (A) A<br>(C) I–A  | (B)<br>(D)          | A–I<br>I                                 |
| 184. | The number of bijective functions from a set A to i   | tself w             | when A contains 106 elements is          |
|      | (A) 106<br>(C) 106 !  | (B)<br>(D)          | $\frac{106^3}{2^{106}}$                  |
| 185. | The value of $\begin{vmatrix} 11 & 12 & 13 \\ 12 & 13 & 14 \\ 12 & 14 & 15 \end{vmatrix}$ is                              |                     |  |
|      | (A) 1 (A) 1   | (B)                 | 0  |
| 107  | (C) -1  | (D)                 | 67                                       |
| 186. | The mean deviation of the data 3, 10, 10, 4, $7, 10, 5$<br>(A) 2  | (B)                 | 2.57                                     |
| 187  | (C) $3$<br>The standard deviation of the data 6 5 9 13 12 8   | (D)<br>10 is        | 3.75                                     |
| 107. | (A) $\sqrt{\frac{52}{7}}$   | (B)                 | <u>52</u><br>7                           |
|      | (C) $\sqrt{6}$  | (D)                 | 6  |
| 188. | Let a, b, c, d, e be the observations with mean m an of the observations $a+k$ $b+k$ $c+k$ $d+k$ $e+k$ is                 | d stan              | dard deviation s. The standard deviation |
|      | (A) ks  | (B)                 | S (1                                     |
|      | (C) $S+K$   | (D)                 | S/K                                      |

| 189.               | Coefficients of variation of two distributions are 50<br>25, respectively. Difference of their standard devia  | ) and (<br>tions i | 60, and their arithmetic means are 30 and s |  |  |  |  |  |  |  |
|--------------------|--|--------------------|---|--|--|--|--|--|--|--|
|                    | (A) 2.5  | (B)                | 1   |  |  |  |  |  |  |  |
|                    | (C) 1.5  | (D)                | 0   |  |  |  |  |  |  |  |
| 190.               | Consider the first 10 positive integers. If we multip<br>number, the variance of the numbers so obtained is  | ly eac             | h number by -1 and then add 1 to each       |  |  |  |  |  |  |  |
|                    | (A) 8.25   | (B)                | 6.50  |  |  |  |  |  |  |  |
| 101                | (C) 3.87   | (D)                | 2.87  |  |  |  |  |  |  |  |
| 191.               | For a linear programming equations, convex set of  | equat              | Disposed solutions                          |  |  |  |  |  |  |  |
|                    | (A) Feasible solutions<br>(C) Profit solutions   | (D)                | Loss solutions                              |  |  |  |  |  |  |  |
| 100                |  | (D)                |   |  |  |  |  |  |  |  |
| all constraints is |  |                    |   |  |  |  |  |  |  |  |
|                    | (A) at least 1   | (B)                | 0   |  |  |  |  |  |  |  |
|                    | (C) An infinite number   | (D)                | At least 2                                  |  |  |  |  |  |  |  |
| 193.               | A constraint that does not affect the feasible region  | is a               |   |  |  |  |  |  |  |  |
|                    | (A) Non-negativity constraint  | (B)                | Redundant constraint                        |  |  |  |  |  |  |  |
|                    | (C) Standard constraint  | (D)                | Slack constraint                            |  |  |  |  |  |  |  |
| 194.               | Consider the following LPP. Maximize $3x_1 + 8x_2$ subject to $2x_1 + 5x_2 \le 10$ , $6x_1 + x_2 \le 6$ , $x_1, x_2 = 0$ . The optimal value of the function is  |                    |   |  |  |  |  |  |  |  |
|                    | (A) 0  | (B)                | 3   |  |  |  |  |  |  |  |
|                    | (C) $111$  | (D)                | 16  |  |  |  |  |  |  |  |
|                    | 7  |                    |   |  |  |  |  |  |  |  |
| 195.               | For linear inequalities, solution set for a group of in  | nequal             | ities is classified as                      |  |  |  |  |  |  |  |
|                    | (A) Concave set  | (B)                | Convex set                                  |  |  |  |  |  |  |  |
|                    | (C) Loss set   | (D)                | Profit set                                  |  |  |  |  |  |  |  |
| 196.               | Which of the following is unary operations?  | (=)                |   |  |  |  |  |  |  |  |
|                    | (A) Addition   | (B)                | Multiplication                              |  |  |  |  |  |  |  |
|                    | (C) Square root  | (D)                | None of these                               |  |  |  |  |  |  |  |
| 197.               | If * is a binary operation in A then   | (=)                |   |  |  |  |  |  |  |  |
|                    | (A) A is closed under *  | (B)                | A is not closed under *                     |  |  |  |  |  |  |  |
| 108                | (C) A is not closed under +<br>Which of the following statements is not correct?   | (D)                | A is closed under –                         |  |  |  |  |  |  |  |
| 198.               | (A) $L \circ \sigma_{10} = 1$  | (B)                | $\log (2 + 3) = \log (2 \times 3)$          |  |  |  |  |  |  |  |
|                    | $\begin{array}{ccc} (A) & Log_{10} & 10 & 1 \\ (C) & Log_{10} & 1 = 0 \end{array}$   | (D)                | $\log(2+3) = \log(2+3)$                     |  |  |  |  |  |  |  |
| 100                | $(2) = 2 g_{10} + 1 (1/2)$ | (2)                |   |  |  |  |  |  |  |  |
| 199.               | If $\log (a/b) + \log (b/a) = \log (a+b)$ , then<br>(A) $a+b=1$  | $(\mathbf{R})$     | a h=1                                       |  |  |  |  |  |  |  |
|                    | $ \begin{array}{c} (A) & a+b-1 \\ (C) & a=b \end{array} $  | $(\mathbf{D})$     | $a^{2}-b^{2}=1$                             |  |  |  |  |  |  |  |
| 200.               | The value of e is  | (1)                | w C 1                                       |  |  |  |  |  |  |  |
|                    | (A) 0  | (B)                | 1   |  |  |  |  |  |  |  |
|                    | (C) 2.718  | (D)                | 2.14  |  |  |  |  |  |  |  |
|                    |  |                    |   |  |  |  |  |  |  |  |

### PCB UG A- ANSWER KEY

| Q.  | An | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | <b>Q</b> . | Ans |
|-----|----|-----|-----|-----|-------|-----|-----|-----|-----|------------|-----|
| No. | S  | No. |     | No. | r     | No. | wer | No. | wer | No.        | wer |
| 1.  | C  | 35. | А   | 69. | Α     | 103 | All | 137 | В   | 171        | C   |
| 2.  | В  | 36. | D   | 70. | D     | 104 | В   | 138 | Α   | 172        | D   |
| 3.  | Α  | 37. | С   | 71. | В     | 105 | D   | 139 | Α   | 173        | D   |
| 4.  | D  | 38. | А   | 72. | В     | 106 | В   | 140 | Α   | 174        | Α   |
| 5.  | С  | 39. | D   | 73. | С     | 107 | С   | 141 | С   | 175        | С   |
| 6.  | В  | 40  | В   | 74. | D     | 108 | С   | 142 | D   | 176        | D   |
| 7.  | Α  | 41. | С   | 75. | D     | 109 | С   | 143 | С   | 177        | D   |
| 8.  | D  | 42. | D   | 76. | Α     | 110 | В   | 144 | D   | 178        | В   |
| 9.  | Α  | 43. | А   | 77. | С     | 111 | Α   | 145 | В   | 179        | D   |
| 10. | В  | 44. | В   | 78. | В     | 112 | В   | 146 | All | 180        | Α   |
| 11. | С  | 45. | С   | 79. | A/B   | 113 | D   | 147 | Α   | 181        | Α   |
| 12. | D  | 46. | А   | 80. | С     | 114 | Α   | 148 | Α   | 182        | С   |
| 13. | Α  | 47. | С   | 81. | В     | 115 | С   | 149 | Α   | 183        | D   |
| 14. | В  | 48. | С   | 82. | D     | 116 | D   | 150 | D   | 184        | В   |
| 15. | С  | 49. | D   | 83. | Α     | 117 | Α   | 151 | С   | 185        | С   |
| 16. | D  | 50. | В   | 84. | Α     | 118 | Α   | 152 | D   | 186        | Α   |
| 17. | Α  | 51. | D   | 85  | С     | 119 | D   | 153 | Α   | 187        | В   |
| 18. | С  | 52. | В   | 86  | С     | 120 | С   | 154 | Α   | 188        | В   |
| 19. | Α  | 53. | D   | 87  | С     | 121 | С   | 155 | С   | 189        | All |
| 20. | В  | 54. | Α   | 88  | В     | 122 | Α   | 156 | С   | 190        | A   |
| 21. | D  | 55. | D   | 89  | С     | 123 | Α   | 157 | В   | 191        | All |
| 22. | Α  | 56. | С   | 90  | В     | 124 | All | 158 | С   | 192        | В   |
| 23. | С  | 57. | Α   | 91  | Α     | 125 | D   | 159 | B/D | 193        | С   |
| 24. | С  | 58. | С   | 92  | В     | 126 | Α   | 160 | Α   | 194        | В   |
| 25. | В  | 59. | С   | 93  | Α     | 127 | В   | 161 | All | 195        | С   |
| 26. | Α  | 60. | D   | 94  | С     | 128 | С   | 162 | Α   | 196        | C   |
| 27. | С  | 61. | Α   | 95  | В     | 129 | С   | 163 | D   | 197        | Α   |
| 28. | D  | 62. | В   | 96  | В     | 130 | Α   | 164 | D   | 198        | В   |
| 29. | В  | 63. | D   | 97  | В     | 131 | С   | 165 | All | 199        | В   |
| 30. | Α  | 64. | В   | 98  | D     | 132 | D   | 166 | С   | 200        | C   |
| 31. | D  | 65. | С   | 99  | С     | 133 | В   | 167 | В   |            |     |
| 32. | В  | 66. | D   | 100 | D     | 134 | С   | 168 | D   |            |     |
| 33. | В  | 67. | С   | 101 | C/B   | 135 | Α   | 169 | D   |            |     |
| 34. | С  | 68. | А   | 102 | Α     | 136 | В   | 170 | D   |            |     |

### PCB UG B- ANSWER KEY

| Q.  | Ans | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | Q.  | Ans |
|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| No. |     | No. |     | No. | r     | No. | wer | No. | wer | No. | wer |
| 1.  | D   | 35. | С   | 69. | D     | 103 | A   | 137 | В   | 171 | D   |
| 2.  | В   | 36. | C   | 70. | C     | 104 | A   | 138 | В   | 172 | A   |
| 3.  | D   | 37. | С   | 71. | C     | 105 | C   | 139 | All | 173 | C   |
| 4.  | A   | 38. | В   | 72. | A     | 106 | С   | 140 | Α   | 174 | С   |
| 5.  | D   | 39. | С   | 73. | Α     | 107 | В   | 141 | All | 175 | В   |
| 6.  | С   | 40  | В   | 74. | All   | 108 | С   | 142 | В   | 176 | Α   |
| 7.  | A   | 41. | Α   | 75. | D     | 109 | B/D | 143 | С   | 177 | С   |
| 8.  | C   | 42. | В   | 76. | Α     | 110 | Α   | 144 | В   | 178 | D   |
| 9.  | С   | 43. | Α   | 77. | В     | 111 | All | 145 | С   | 179 | В   |
| 10. | D   | 44. | С   | 78. | С     | 112 | Α   | 146 | С   | 180 | Α   |
| 11. | Α   | 45. | В   | 79. | С     | 113 | D   | 147 | А   | 181 | D   |
| 12. | В   | 46. | В   | 80. | А     | 114 | D   | 148 | В   | 182 | В   |
| 13. | D   | 47. | В   | 81. | С     | 115 | All | 149 | В   | 183 | В   |
| 14. | В   | 48. | D   | 82. | D     | 116 | С   | 150 | С   | 184 | С   |
| 15. | С   | 49. | С   | 83. | В     | 117 | В   | 151 | С   | 185 | А   |
| 16. | D   | 50. | D   | 84. | С     | 118 | D   | 152 | В   | 186 | D   |
| 17. | С   | 51. | C/B | 85  | Α     | 119 | D   | 153 | А   | 187 | С   |
| 18. | Α   | 52. | Α   | 86  | В     | 120 | D   | 154 | D   | 188 | Α   |
| 19. | Α   | 53. | All | 87  | В     | 121 | С   | 155 | С   | 189 | D   |
| 20. | D   | 54. | В   | 88  | А     | 122 | D   | 156 | В   | 190 | В   |
| 21. | В   | 55. | D   | 89  | Α     | 123 | D   | 157 | А   | 191 | С   |
| 22. | В   | 56. | В   | 90  | Α     | 124 | Α   | 158 | D   | 192 | D   |
| 23. | С   | 57. | С   | 91  | С     | 125 | С   | 159 | А   | 193 | Α   |
| 24. | D   | 58. | С   | 92  | D     | 126 | D   | 160 | В   | 194 | В   |
| 25. | D   | 59. | С   | 93  | С     | 127 | D   | 161 | С   | 195 | С   |
| 26. | Α   | 60. | В   | 94  | D     | 128 | В   | 162 | D   | 196 | Α   |
| 27. | С   | 61. | Α   | 95  | В     | 129 | D   | 163 | А   | 197 | С   |
| 28. | В   | 62. | В   | 96  | All   | 130 | Α   | 164 | В   | 198 | С   |
| 29. | A/B | 63. | D   | 97  | Α     | 131 | Α   | 165 | С   | 199 | D   |
| 30. | С   | 64. | Α   | 98  | Α     | 132 | С   | 166 | D   | 200 | В   |
| 31. | В   | 65. | С   | 99  | Α     | 133 | D   | 167 | А   |     |     |
| 32. | D   | 66. | D   | 100 | D     | 134 | В   | 168 | С   |     |     |
| 33. | Α   | 67. | Α   | 101 | С     | 135 | С   | 169 | А   |     |     |
| 34. | Α   | 68. | Α   | 102 | D     | 136 | Α   | 170 | В   |     |     |

### PCB UG C- ANSWER KEY

| Q.  | Ans | <b>Q</b> . | Ans | Q.  | Ans | <b>Q</b> . | Ans | Q.  | Ans | <b>Q</b> . | Ans |
|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|------------|-----|
| No. |     | No.        |     | No. |     | No.        |     | No. |     | No.        |     |
| 1.  | C/B | 35.        | Α   | 69. | D   | 103        | Α   | 137 | С   | 171        | В   |
| 2.  | Α   | 36.        | В   | 70. | D   | 104        | D   | 138 | Α   | 172        | В   |
| 3.  | All | 37.        | В   | 71. | С   | 105        | С   | 139 | D   | 173        | С   |
| 4.  | В   | 38.        | А   | 72. | D   | 106        | В   | 140 | В   | 174        | D   |
| 5.  | D   | 39.        | А   | 73. | D   | 107        | Α   | 141 | С   | 175        | D   |
| 6.  | В   | 40         | А   | 74. | А   | 108        | D   | 142 | D   | 176        | Α   |
| 7.  | С   | 41.        | С   | 75. | С   | 109        | Α   | 143 | Α   | 177        | С   |
| 8.  | С   | 42.        | D   | 76. | D   | 110        | В   | 144 | В   | 178        | В   |
| 9.  | С   | 43.        | С   | 77. | D   | 111        | С   | 145 | С   | 179        | A/B |
| 10. | В   | 44.        | D   | 78. | В   | 112        | D   | 146 | А   | 180        | С   |
| 11. | Α   | 45.        | В   | 79. | D   | 113        | Α   | 147 | С   | 181        | В   |
| 12. | В   | 46.        | All | 80. | А   | 114        | В   | 148 | С   | 182        | D   |
| 13. | D   | 47.        | А   | 81. | А   | 115        | С   | 149 | D   | 183        | Α   |
| 14. | Α   | 48.        | А   | 82. | С   | 116        | D   | 150 | В   | 184        | Α   |
| 15. | С   | 49.        | А   | 83. | D   | 117        | Α   | 151 | D   | 185        | С   |
| 16. | D   | 50.        | D   | 84. | В   | 118        | С   | 152 | В   | 186        | С   |
| 17. | Α   | 51.        | С   | 85  | С   | 119        | Α   | 153 | D   | 187        | С   |
| 18. | Α   | 52.        | D   | 86  | А   | 120        | В   | 154 | А   | 188        | В   |
| 19. | D   | 53.        | А   | 87  | В   | 121        | D   | 155 | D   | 189        | С   |
| 20. | С   | 54.        | А   | 88  | В   | 122        | Α   | 156 | С   | 190        | В   |
| 21. | С   | 55.        | С   | 89  | All | 123        | С   | 157 | А   | 191        | Α   |
| 22. | Α   | 56.        | С   | 90  | А   | 124        | С   | 158 | С   | 192        | В   |
| 23. | Α   | 57.        | В   | 91  | All | 125        | В   | 159 | С   | 193        | Α   |
| 24. | All | 58.        | С   | 92  | В   | 126        | Α   | 160 | D   | 194        | С   |
| 25. | D   | 59.        | B/D | 93  | С   | 127        | С   | 161 | А   | 195        | В   |
| 26. | Α   | 60.        | А   | 94  | В   | 128        | D   | 162 | В   | 196        | В   |
| 27. | В   | 61.        | All | 95  | С   | 129        | В   | 163 | D   | 197        | В   |
| 28. | С   | 62.        | А   | 96  | С   | 130        | А   | 164 | В   | 198        | D   |
| 29. | С   | 63.        | D   | 97  | А   | 131        | D   | 165 | С   | 199        | С   |
| 30. | Α   | 64.        | D   | 98  | В   | 132        | В   | 166 | D   | 200        | D   |
| 31. | С   | 65.        | All | 99  | В   | 133        | В   | 167 | С   |            |     |
| 32. | D   | 66.        | С   | 100 | С   | 134        | С   | 168 | А   |            |     |
| 33. | В   | 67.        | В   | 101 | С   | 135        | Α   | 169 | А   |            |     |
| 34. | С   | 68.        | D   | 102 | В   | 136        | D   | 170 | D   |            |     |

### PCB UG D- ANSWER KEY

| <b>Q</b> . | Ans | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | Q.  | Ans |
|------------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| No.        |     | No. |     | No. | r     | No. | wer | No. | wer | No. | wer |
| 1.         | C   | 35. | С   | 69. | A     | 103 | D   | 137 | С   | 171 | С   |
| 2.         | D   | 36. | A   | 70. | В     | 104 | A   | 138 | В   | 172 | Α   |
| 3.         | Α   | 37. | В   | 71. | D     | 105 | D   | 139 | С   | 173 | Α   |
| 4.         | Α   | 38. | В   | 72. | A     | 106 | С   | 140 | В   | 174 | All |
| 5.         | С   | 39. | All | 73. | С     | 107 | Α   | 141 | Α   | 175 | D   |
| 6.         | C   | 40  | А   | 74. | С     | 108 | С   | 142 | В   | 176 | Α   |
| 7.         | В   | 41. | All | 75. | В     | 109 | С   | 143 | Α   | 177 | В   |
| 8.         | С   | 42. | В   | 76. | Α     | 110 | D   | 144 | С   | 178 | С   |
| 9.         | B/D | 43. | С   | 77. | С     | 111 | Α   | 145 | В   | 179 | С   |
| 10.        | А   | 44. | В   | 78. | D     | 112 | В   | 146 | В   | 180 | Α   |
| 11.        | All | 45. | С   | 79. | В     | 113 | D   | 147 | В   | 181 | С   |
| 12.        | Α   | 46. | С   | 80. | Α     | 114 | В   | 148 | D   | 182 | D   |
| 13.        | D   | 47. | А   | 81. | D     | 115 | С   | 149 | С   | 183 | В   |
| 14.        | D   | 48. | В   | 82. | В     | 116 | D   | 150 | D   | 184 | С   |
| 15.        | All | 49. | В   | 83. | В     | 117 | С   | 151 | C/B | 185 | Α   |
| 16.        | С   | 50. | С   | 84. | С     | 118 | Α   | 152 | А   | 186 | В   |
| 17.        | В   | 51. | С   | 85  | А     | 119 | Α   | 153 | All | 187 | В   |
| 18.        | D   | 52. | В   | 86  | D     | 120 | D   | 154 | В   | 188 | А   |
| 19.        | D   | 53. | А   | 87  | С     | 121 | В   | 155 | D   | 189 | А   |
| 20.        | D   | 54. | D   | 88  | Α     | 122 | В   | 156 | В   | 190 | А   |
| 21.        | С   | 55. | С   | 89  | D     | 123 | С   | 157 | С   | 191 | С   |
| 22.        | D   | 56. | В   | 90  | В     | 124 | D   | 158 | С   | 192 | D   |
| 23.        | D   | 57. | А   | 91  | С     | 125 | D   | 159 | С   | 193 | С   |
| 24.        | А   | 58. | D   | 92  | D     | 126 | А   | 160 | В   | 194 | D   |
| 25.        | С   | 59. | А   | 93  | А     | 127 | С   | 161 | А   | 195 | В   |
| 26.        | D   | 60. | В   | 94  | В     | 128 | В   | 162 | В   | 196 | All |
| 27.        | D   | 61. | С   | 95  | С     | 129 | A/B | 163 | D   | 197 | А   |
| 28.        | В   | 62. | D   | 96  | A     | 130 | С   | 164 | А   | 198 | А   |
| 29.        | D   | 63. | А   | 97  | С     | 131 | B   | 165 | С   | 199 | А   |
| 30.        | А   | 64. | В   | 98  | C     | 132 | D   | 166 | D   | 200 | D   |
| 31.        | Ā   | 65. | C   | 99  | D     | 133 | A   | 167 | A   |     |     |
| 32.        | C   | 66. | D   | 100 | B     | 134 | A   | 168 | A   |     |     |
| 33.        | D   | 67. | A   | 101 | D     | 135 | C   | 169 | D   |     |     |
| 34.        | В   | 68. | С   | 102 | В     | 136 | C   | 170 | С   |     |     |

# PCM UG A Answer key

| Q.  | An  | Q.  | Ans | <b>Q</b> . | Answe | Q.  | Ans | Q.  | Ans | <b>Q.</b> | Ans |
|-----|-----|-----|-----|------------|-------|-----|-----|-----|-----|-----------|-----|
| No. | S   | No. |     | No.        | r     | No. | wer | No. | wer | No.       | wer |
| 1.  | C/B | 35. | Α   | 69.        | D     | 103 | Α   | 137 | Α   | 171       | D   |
| 2.  | Α   | 36. | В   | 70.        | D     | 104 | Α   | 138 | В   | 172       | D   |
| 3.  | All | 37. | В   | 71.        | С     | 105 | Α   | 139 | D   | 173       | В   |
| 4.  | В   | 38. | Α   | 72.        | D     | 106 | С   | 140 | А   | 174       | A   |
| 5.  | D   | 39. | Α   | 73.        | D     | 107 | С   | 141 | А   | 175       | D   |
| 6.  | В   | 40  | Α   | 74.        | Α     | 108 | Α   | 142 | В   | 176       | В   |
| 7.  | С   | 41. | С   | 75.        | С     | 109 | D   | 143 | В   | 177       | D   |
| 8.  | С   | 42. | D   | 76.        | D     | 110 | В   | 144 | D   | 178       | В   |
| 9.  | С   | 43. | С   | 77.        | D     | 111 | Α   | 145 | В   | 179       | В   |
| 10. | В   | 44. | D   | 78.        | В     | 112 | Α   | 146 | A/B | 180       | В   |
| 11. | Α   | 45. | В   | 79.        | D     | 113 | В   | 147 | А   | 181       | Α   |
| 12. | В   | 46. | All | 80.        | A     | 114 | D   | 148 | В   | 182       | Α   |
| 13. | D   | 47. | Α   | 81.        | Α     | 115 | С   | 149 | Α   | 183       | Α   |
| 14. | Α   | 48. | А   | 82.        | С     | 116 | Α   | 150 | С   | 184       | C   |
| 15. | С   | 49. | А   | 83.        | D     | 117 | D   | 151 | D   | 185       | В   |
| 16. | D   | 50. | D   | 84.        | В     | 118 | С   | 152 | А   | 186       | D   |
| 17. | Α   | 51. | С   | 85         | С     | 119 | В   | 153 | С   | 187       | C   |
| 18. | Α   | 52. | D   | 86         | Α     | 120 | С   | 154 | В   | 188       | Α   |
| 19. | D   | 53. | Α   | 87         | В     | 121 | D   | 155 | D   | 189       | В   |
| 20. | С   | 54. | Α   | 88         | В     | 122 | D   | 156 | С   | 190       | All |
| 21. | С   | 55. | С   | 89         | All   | 123 | Α   | 157 | Α   | 191       | В   |
| 22. | Α   | 56. | С   | 90         | Α     | 124 | Α   | 158 | D   | 192       | C   |
| 23. | Α   | 57. | В   | 91         | All   | 125 | В   | 159 | В   | 193       | D   |
| 24. | All | 58. | С   | 92         | В     | 126 | В   | 160 | В   | 194       | All |
| 25. | D   | 59. | B/D | 93         | С     | 127 | С   | 161 | С   | 195       | C   |
| 26. | А   | 60. | Α   | 94         | В     | 128 | В   | 162 | С   | 196       | C   |
| 27. | В   | 61. | All | 95         | С     | 129 | D   | 163 | D   | 197       | В   |
| 28. | С   | 62. | Α   | 96         | С     | 130 | В   | 164 | D   | 198       | В   |
| 29. | С   | 63. | D   | 97         | Α     | 131 | All | 165 | А   | 199       | Α   |
| 30. | Α   | 64. | D   | 98         | В     | 132 | D   | 166 | All | 200       | C   |
| 31. | С   | 65. | All | 99         | В     | 133 | С   | 167 | D   |           |     |
| 32. | D   | 66. | С   | 100        | С     | 134 | С   | 168 | С   |           |     |
| 33. | В   | 67. | В   | 101        | Α     | 135 | В   | 169 | Α   |           |     |
| 34. | С   | 68. | D   | 102        | В     | 136 | В   | 170 | С   |           |     |

# PCM UG B Answer key

| Q.  | Ans | Q.       | Ans      | Q.         | Answe  | Q.  | Ans      | Q.  | Ans | Q.       | Ans      |
|-----|-----|----------|----------|------------|--------|-----|----------|-----|-----|----------|----------|
| NO. | C   | NO.      | 0        | No.        | r<br>D | NO. | wer      | NO. | wer | NO.      | wer      |
| 1.  |     | <u> </u> |          | <u>69.</u> | B      | 103 |          | 13/ | 0   | 1/1      | 0        |
| 2.  |     | 36.      | A        | /0.        |        | 104 | B        | 138 | A   | 172      | A        |
| 3.  | A   | 37.      | B        | /1.        | D      | 105 | D        | 139 | B   | 1/3      | A 11     |
| 4.  | A   | 38.      | B        | 72.        | D      | 106 | C        | 140 | All | 174      | All      |
| 5.  | C   | 39.      | All      | 73.        | A      | 107 | A        | 141 | B   | 175      | D        |
| 6.  | C   | 40       | A        | 74.        | A      | 108 | D        | 142 | C   | 176      | A        |
| 7.  | В   | 41.      | All      | 75.        | В      | 109 | В        | 143 | D   | 177      | В        |
| 8.  | C   | 42.      | В        | 76.        | В      | 110 | В        | 144 | All | 178      | С        |
| 9.  | B/D | 43.      | С        | 77.        | C      | 111 | C        | 145 | С   | 179      | С        |
| 10. | Α   | 44.      | В        | 78.        | В      | 112 | С        | 146 | С   | 180      | Α        |
| 11. | All | 45.      | С        | 79.        | D      | 113 | D        | 147 | В   | 181      | С        |
| 12. | Α   | 46.      | С        | 80.        | В      | 114 | D        | 148 | В   | 182      | D        |
| 13. | D   | 47.      | А        | 81.        | All    | 115 | Α        | 149 | А   | 183      | В        |
| 14. | D   | 48.      | В        | 82.        | D      | 116 | All      | 150 | С   | 184      | С        |
| 15. | All | 49.      | В        | 83.        | С      | 117 | D        | 151 | C/B | 185      | Α        |
| 16. | С   | 50.      | С        | 84.        | С      | 118 | С        | 152 | А   | 186      | В        |
| 17. | В   | 51.      | А        | 85         | В      | 119 | Α        | 153 | All | 187      | В        |
| 18. | D   | 52.      | В        | 86         | В      | 120 | С        | 154 | В   | 188      | А        |
| 19. | D   | 53.      | А        | 87         | А      | 121 | D        | 155 | D   | 189      | А        |
| 20. | D   | 54.      | А        | 88         | В      | 122 | D        | 156 | В   | 190      | А        |
| 21. | С   | 55.      | А        | 89         | D      | 123 | В        | 157 | С   | 191      | С        |
| 22. | D   | 56.      | С        | 90         | Α      | 124 | А        | 158 | С   | 192      | D        |
| 23  | D   | 57       | C        | 91         | A      | 125 | D        | 159 | C   | 193      | C        |
| 24  | A   | 58       | A        | 92         | B      | 126 | B        | 160 | B   | 194      | D        |
| 25. | C   | 59.      | D        | 93         | B      | 127 | D        | 161 | A   | 195      | B        |
| 26  | D   | 60       | B        | 94         | D      | 128 | B        | 162 | B   | 196      | All      |
| 27  | D   | 61       | A        | 95         | B      | 129 | B        | 163 | D   | 197      | A        |
| 28  | B   | 62       | A        | 96         | A/B    | 130 | B        | 164 | A   | 198      | A        |
| 20. | D   | 63       | B        | 97         | A      | 131 | A        | 165 | C   | 199      | A        |
| 30  |     | 64       | <u>р</u> | 98         | R      | 137 | Δ        | 166 |     | 200      | D        |
| 31  | A   | 65       | C        | 99         | A      | 133 | A        | 167 | A   | 200      | D        |
| 32  | C   | 66       | Δ        | 100        | C      | 13/ | C        | 168 | Δ   |          |          |
| 32. |     | 67       |          | 101        |        | 135 | R        | 160 |     |          |          |
| 34  | B   | 68       | C D      | 102        | Δ      | 136 | <u>d</u> | 170 | C   | <u> </u> | <u> </u> |

### PCM UG C Answer key

| Q.  | An  | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | Q.  | Ans |
|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| No. | S   | No. |     | No. | r     | No. | wer | No. | wer | No. | wer |
| 1.  | Α   | 35. | В   | 69. | A     | 103 | All | 137 | В   | 171 | C   |
| 2.  | В   | 36. | В   | 70. | С     | 104 | В   | 138 | Α   | 172 | D   |
| 3.  | Α   | 37. | Α   | 71. | D     | 105 | D   | 139 | Α   | 173 | D   |
| 4.  | Α   | 38. | В   | 72. | D     | 106 | В   | 140 | Α   | 174 | Α   |
| 5.  | Α   | 39. | D   | 73. | В     | 107 | С   | 141 | С   | 175 | C   |
| 6.  | С   | 40  | Α   | 74. | A     | 108 | С   | 142 | D   | 176 | D   |
| 7.  | С   | 41. | Α   | 75. | D     | 109 | С   | 143 | С   | 177 | D   |
| 8.  | Α   | 42. | В   | 76. | В     | 110 | В   | 144 | D   | 178 | В   |
| 9.  | D   | 43. | В   | 77. | D     | 111 | Α   | 145 | В   | 179 | D   |
| 10. | В   | 44. | D   | 78. | В     | 112 | В   | 146 | All | 180 | Α   |
| 11. | Α   | 45. | В   | 79. | В     | 113 | D   | 147 | Α   | 181 | Α   |
| 12. | Α   | 46. | A/B | 80. | В     | 114 | Α   | 148 | Α   | 182 | С   |
| 13. | В   | 47. | А   | 81. | Α     | 115 | С   | 149 | Α   | 183 | D   |
| 14. | D   | 48. | В   | 82. | Α     | 116 | D   | 150 | D   | 184 | В   |
| 15. | С   | 49. | А   | 83. | Α     | 117 | Α   | 151 | С   | 185 | С   |
| 16. | Α   | 50. | С   | 84. | С     | 118 | Α   | 152 | D   | 186 | Α   |
| 17. | D   | 51. | D   | 85  | В     | 119 | D   | 153 | Α   | 187 | В   |
| 18. | С   | 52. | А   | 86  | D     | 120 | С   | 154 | Α   | 188 | В   |
| 19. | В   | 53. | С   | 87  | С     | 121 | С   | 155 | С   | 189 | All |
| 20. | С   | 54. | В   | 88  | Α     | 122 | Α   | 156 | С   | 190 | Α   |
| 21. | D   | 55. | D   | 89  | В     | 123 | Α   | 157 | В   | 191 | All |
| 22. | D   | 56. | С   | 90  | All   | 124 | All | 158 | С   | 192 | В   |
| 23. | Α   | 57. | А   | 91  | В     | 125 | D   | 159 | B/D | 193 | С   |
| 24. | Α   | 58. | D   | 92  | С     | 126 | Α   | 160 | Α   | 194 | В   |
| 25. | В   | 59. | В   | 93  | D     | 127 | В   | 161 | All | 195 | С   |
| 26. | В   | 60. | В   | 94  | All   | 128 | С   | 162 | Α   | 196 | С   |
| 27. | С   | 61. | С   | 95  | С     | 129 | С   | 163 | D   | 197 | Α   |
| 28. | В   | 62. | С   | 96  | С     | 130 | Α   | 164 | D   | 198 | В   |
| 29. | D   | 63. | D   | 97  | В     | 131 | С   | 165 | All | 199 | В   |
| 30. | В   | 64. | D   | 98  | В     | 132 | D   | 166 | С   | 200 | C   |
| 31. | All | 65. | Α   | 99  | Α     | 133 | В   | 167 | В   |     |     |
| 32. | D   | 66. | All | 100 | С     | 134 | С   | 168 | D   |     |     |
| 33. | С   | 67. | D   | 101 | C/B   | 135 | Α   | 169 | D   |     |     |
| 34. | С   | 68. | С   | 102 | Α     | 136 | В   | 170 | D   |     |     |

# PCM UG D Answer key

| <b>Q.</b> | An  | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | Q.  | Ans |
|-----------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| No.       | S   | No. |     | No. | r     | No. | wer | No. | wer | No. | wer |
| 1.        | D   | 35. | В   | 69. | D     | 103 | A   | 137 | В   | 171 | D   |
| 2.        | Α   | 36. | D   | 70. | С     | 104 | Α   | 138 | В   | 172 | D   |
| 3.        | С   | 37. | С   | 71. | С     | 105 | С   | 139 | All | 173 | Α   |
| 4.        | В   | 38. | Α   | 72. | Α     | 106 | С   | 140 | Α   | 174 | Α   |
| 5.        | D   | 39. | В   | 73. | Α     | 107 | В   | 141 | All | 175 | В   |
| 6.        | С   | 40  | All | 74. | All   | 108 | С   | 142 | В   | 176 | В   |
| 7.        | Α   | 41. | В   | 75. | D     | 109 | B/D | 143 | С   | 177 | С   |
| 8.        | D   | 42. | С   | 76. | Α     | 110 | Α   | 144 | В   | 178 | В   |
| 9.        | В   | 43. | D   | 77. | В     | 111 | All | 145 | С   | 179 | D   |
| 10.       | В   | 44. | All | 78. | С     | 112 | Α   | 146 | С   | 180 | В   |
| 11.       | С   | 45. | С   | 79. | С     | 113 | D   | 147 | Α   | 181 | All |
| 12.       | С   | 46. | С   | 80. | Α     | 114 | D   | 148 | В   | 182 | D   |
| 13.       | D   | 47. | В   | 81. | С     | 115 | All | 149 | В   | 183 | С   |
| 14.       | D   | 48. | В   | 82. | D     | 116 | С   | 150 | С   | 184 | С   |
| 15.       | Α   | 49. | А   | 83. | В     | 117 | В   | 151 | Α   | 185 | В   |
| 16.       | All | 50. | С   | 84. | С     | 118 | D   | 152 | В   | 186 | В   |
| 17.       | D   | 51. | C/B | 85  | Α     | 119 | D   | 153 | Α   | 187 | Α   |
| 18.       | С   | 52. | А   | 86  | В     | 120 | D   | 154 | Α   | 188 | В   |
| 19.       | Α   | 53. | All | 87  | В     | 121 | С   | 155 | Α   | 189 | D   |
| 20.       | C   | 54. | В   | 88  | Α     | 122 | D   | 156 | С   | 190 | Α   |
| 21.       | D   | 55. | D   | 89  | Α     | 123 | D   | 157 | С   | 191 | Α   |
| 22.       | D   | 56. | В   | 90  | Α     | 124 | Α   | 158 | Α   | 192 | В   |
| 23.       | В   | 57. | С   | 91  | С     | 125 | С   | 159 | D   | 193 | В   |
| 24.       | Α   | 58. | С   | 92  | D     | 126 | D   | 160 | В   | 194 | D   |
| 25.       | D   | 59. | С   | 93  | С     | 127 | D   | 161 | Α   | 195 | В   |
| 26.       | В   | 60. | В   | 94  | D     | 128 | В   | 162 | Α   | 196 | A/B |
| 27.       | D   | 61. | А   | 95  | В     | 129 | D   | 163 | В   | 197 | Α   |
| 28.       | В   | 62. | В   | 96  | All   | 130 | Α   | 164 | D   | 198 | В   |
| 29.       | В   | 63. | D   | 97  | Α     | 131 | Α   | 165 | С   | 199 | Α   |
| 30.       | В   | 64. | А   | 98  | Α     | 132 | С   | 166 | Α   | 200 | С   |
| 31.       | Α   | 65. | С   | 99  | Α     | 133 | D   | 167 | D   |     |     |
| 32.       | Α   | 66. | D   | 100 | D     | 134 | В   | 168 | С   |     |     |
| 33.       | Α   | 67. | А   | 101 | С     | 135 | С   | 169 | В   |     |     |
| 34.       | С   | 68. | А   | 102 | D     | 136 | Α   | 170 | С   |     |     |

# PCA UG A Answer key

| Q.  | An  | Q.  | Ans | Q.  | Answe | Q.  | Ans | <b>Q</b> . | Ans | Q.  | Ans |
|-----|-----|-----|-----|-----|-------|-----|-----|------------|-----|-----|-----|
| No. | S   | No. |     | No. | r     | No. | wer | No.        | wer | No. | wer |
| 1.  | C/B | 35. | Α   | 69. | D     | 103 | С   | 137        | Α   | 171 | Α   |
| 2.  | Α   | 36. | В   | 70. | D     | 104 | Α   | 138        | В   | 172 | С   |
| 3.  | All | 37. | В   | 71. | С     | 105 | В   | 139        | Α   | 173 | Α   |
| 4.  | В   | 38. | А   | 72. | D     | 106 | В   | 140        | D   | 174 | С   |
| 5.  | D   | 39. | А   | 73. | D     | 107 | Α   | 141        | D   | 175 | В   |
| 6.  | В   | 40  | А   | 74. | Α     | 108 | В   | 142        | D   | 176 | С   |
| 7.  | С   | 41. | С   | 75. | С     | 109 | В   | 143        | В   | 177 | В   |
| 8.  | С   | 42. | D   | 76. | D     | 110 | С   | 144        | В   | 178 | В   |
| 9.  | С   | 43. | С   | 77. | D     | 111 | А   | 145        | С   | 179 | С   |
| 10. | В   | 44. | D   | 78. | В     | 112 | В   | 146        | С   | 180 | С   |
| 11. | Α   | 45. | В   | 79. | D     | 113 | В   | 147        | С   | 181 | А   |
| 12. | В   | 46. | All | 80. | Α     | 114 | Α   | 148        | D   | 182 | В   |
| 13. | D   | 47. | А   | 81. | А     | 115 | D   | 149        | D   | 183 | D   |
| 14. | Α   | 48. | А   | 82. | С     | 116 | D   | 150        | С   | 184 | Α   |
| 15. | С   | 49. | А   | 83. | D     | 117 | С   | 151        | В   | 185 | С   |
| 16. | D   | 50. | D   | 84. | В     | 118 | В   | 152        | В   | 186 | А   |
| 17. | Α   | 51. | С   | 85  | С     | 119 | Α   | 153        | С   | 187 | D   |
| 18. | Α   | 52. | D   | 86  | Α     | 120 | В   | 154        | В   | 188 | Α   |
| 19. | D   | 53. | А   | 87  | В     | 121 | В   | 155        | С   | 189 | D   |
| 20. | С   | 54. | А   | 88  | В     | 122 | В   | 156        | В   | 190 | Α   |
| 21. | С   | 55. | С   | 89  | All   | 123 | Α   | 157        | D   | 191 | С   |
| 22. | Α   | 56. | С   | 90  | Α     | 124 | С   | 158        | С   | 192 | В   |
| 23. | Α   | 57. | В   | 91  | All   | 125 | С   | 159        | В   | 193 | С   |
| 24. | All | 58. | С   | 92  | В     | 126 | Α   | 160        | С   | 194 | В   |
| 25. | D   | 59. | B/D | 93  | С     | 127 | В   | 161        | С   | 195 | В   |
| 26. | Α   | 60. | А   | 94  | В     | 128 | D   | 162        | В   | 196 | B/D |
| 27. | В   | 61. | All | 95  | С     | 129 | В   | 163        | В   | 197 | В   |
| 28. | С   | 62. | А   | 96  | С     | 130 | В   | 164        | Α   | 198 | В   |
| 29. | С   | 63. | D   | 97  | А     | 131 | D   | 165        | С   | 199 | А   |
| 30. | Α   | 64. | D   | 98  | В     | 132 | Α   | 166        | С   | 200 | В   |
| 31. | С   | 65. | All | 99  | В     | 133 | Α   | 167        | Α   |     |     |
| 32. | D   | 66. | С   | 100 | С     | 134 | В   | 168        | В   |     |     |
| 33. | В   | 67. | В   | 101 | D     | 135 | Α   | 169        | В   |     |     |
| 34. | С   | 68. | D   | 102 | С     | 136 | С   | 170        | D   |     |     |

# PCA UG B Answer key

| <b>Q</b> . | Ans | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | Q.  | Ans |
|------------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|
| No.        |     | No. |     | No. | r     | No. | wer | No. | wer | No. | wer |
| 1.         | С   | 35. | С   | 69. | Α     | 103 | С   | 137 | D   | 171 | С   |
| 2.         | D   | 36. | Α   | 70. | В     | 104 | В   | 138 | А   | 172 | Α   |
| 3.         | Α   | 37. | В   | 71. | В     | 105 | С   | 139 | D   | 173 | Α   |
| 4.         | Α   | 38. | В   | 72. | В     | 106 | В   | 140 | А   | 174 | All |
| 5.         | С   | 39. | All | 73. | Α     | 107 | D   | 141 | С   | 175 | D   |
| 6.         | С   | 40  | Α   | 74. | С     | 108 | С   | 142 | В   | 176 | Α   |
| 7.         | В   | 41. | All | 75. | С     | 109 | В   | 143 | С   | 177 | В   |
| 8.         | С   | 42. | В   | 76. | Α     | 110 | С   | 144 | В   | 178 | С   |
| 9.         | B/D | 43. | С   | 77. | В     | 111 | С   | 145 | В   | 179 | С   |
| 10.        | Α   | 44. | В   | 78. | D     | 112 | В   | 146 | B/D | 180 | Α   |
| 11.        | All | 45. | С   | 79. | В     | 113 | В   | 147 | В   | 181 | С   |
| 12.        | Α   | 46. | С   | 80. | В     | 114 | Α   | 148 | В   | 182 | D   |
| 13.        | D   | 47. | А   | 81. | D     | 115 | С   | 149 | А   | 183 | В   |
| 14.        | D   | 48. | В   | 82. | А     | 116 | С   | 150 | В   | 184 | С   |
| 15.        | All | 49. | В   | 83. | А     | 117 | Α   | 151 | C/B | 185 | Α   |
| 16.        | С   | 50. | С   | 84. | В     | 118 | В   | 152 | А   | 186 | В   |
| 17.        | В   | 51. | D   | 85  | А     | 119 | В   | 153 | All | 187 | В   |
| 18.        | D   | 52. | С   | 86  | С     | 120 | D   | 154 | В   | 188 | Α   |
| 19.        | D   | 53. | С   | 87  | Α     | 121 | Α   | 155 | D   | 189 | Α   |
| 20.        | D   | 54. | Α   | 88  | В     | 122 | С   | 156 | В   | 190 | Α   |
| 21.        | С   | 55. | В   | 89  | Α     | 123 | Α   | 157 | С   | 191 | С   |
| 22.        | D   | 56. | В   | 90  | D     | 124 | С   | 158 | С   | 192 | D   |
| 23.        | D   | 57. | А   | 91  | D     | 125 | В   | 159 | С   | 193 | С   |
| 24.        | Α   | 58. | В   | 92  | D     | 126 | С   | 160 | В   | 194 | D   |
| 25.        | С   | 59. | В   | 93  | В     | 127 | В   | 161 | Α   | 195 | В   |
| 26.        | D   | 60. | С   | 94  | В     | 128 | В   | 162 | В   | 196 | All |
| 27.        | D   | 61. | А   | 95  | С     | 129 | С   | 163 | D   | 197 | Α   |
| 28.        | В   | 62. | В   | 96  | С     | 130 | С   | 164 | А   | 198 | Α   |
| 29.        | D   | 63. | В   | 97  | С     | 131 | Α   | 165 | С   | 199 | Α   |
| 30.        | Α   | 64. | А   | 98  | D     | 132 | В   | 166 | D   | 200 | D   |
| 31.        | Α   | 65. | D   | 99  | D     | 133 | D   | 167 | А   |     |     |
| 32.        | С   | 66. | D   | 100 | С     | 134 | Α   | 168 | А   |     |     |
| 33.        | D   | 67. | С   | 101 | В     | 135 | С   | 169 | D   |     |     |
| 34.        | В   | 68. | В   | 102 | В     | 136 | А   | 170 | С   |     |     |

### PCA UG C Answer key

| Q.  | An | Q.  | Ans | Q.  | Answe | Q.  | Ans | Q.  | Ans | <b>Q.</b> | Ans |
|-----|----|-----|-----|-----|-------|-----|-----|-----|-----|-----------|-----|
| No. | S  | No. |     | No. | r     | No. | wer | No. | wer | No.       | wer |
| 1.  | D  | 35. | Α   | 69. | В     | 103 | All | 137 | В   | 171       | C   |
| 2.  | С  | 36. | С   | 70. | D     | 104 | В   | 138 | Α   | 172       | D   |
| 3.  | С  | 37. | А   | 71. | Α     | 105 | D   | 139 | Α   | 173       | D   |
| 4.  | Α  | 38. | В   | 72. | С     | 106 | В   | 140 | Α   | 174       | Α   |
| 5.  | В  | 39. | А   | 73. | Α     | 107 | C   | 141 | С   | 175       | С   |
| 6.  | В  | 40  | D   | 74. | С     | 108 | C   | 142 | D   | 176       | D   |
| 7.  | Α  | 41. | D   | 75. | В     | 109 | C   | 143 | С   | 177       | D   |
| 8.  | В  | 42. | D   | 76. | С     | 110 | В   | 144 | D   | 178       | В   |
| 9.  | В  | 43. | В   | 77. | В     | 111 | Α   | 145 | В   | 179       | D   |
| 10. | С  | 44. | В   | 78. | В     | 112 | В   | 146 | All | 180       | Α   |
| 11. | Α  | 45. | С   | 79. | С     | 113 | D   | 147 | Α   | 181       | Α   |
| 12. | В  | 46. | С   | 80. | С     | 114 | Α   | 148 | А   | 182       | С   |
| 13. | В  | 47. | С   | 81. | Α     | 115 | С   | 149 | Α   | 183       | D   |
| 14. | Α  | 48. | D   | 82. | В     | 116 | D   | 150 | D   | 184       | В   |
| 15. | D  | 49. | D   | 83. | D     | 117 | Α   | 151 | С   | 185       | С   |
| 16. | D  | 50. | С   | 84. | Α     | 118 | Α   | 152 | D   | 186       | Α   |
| 17. | С  | 51. | В   | 85  | С     | 119 | D   | 153 | Α   | 187       | В   |
| 18. | В  | 52. | В   | 86  | Α     | 120 | С   | 154 | Α   | 188       | В   |
| 19. | Α  | 53. | С   | 87  | D     | 121 | С   | 155 | С   | 189       | All |
| 20. | В  | 54. | В   | 88  | Α     | 122 | Α   | 156 | С   | 190       | Α   |
| 21. | В  | 55. | С   | 89  | D     | 123 | Α   | 157 | В   | 191       | All |
| 22. | В  | 56. | В   | 90  | Α     | 124 | All | 158 | С   | 192       | В   |
| 23. | Α  | 57. | D   | 91  | С     | 125 | D   | 159 | B/D | 193       | С   |
| 24. | С  | 58. | С   | 92  | В     | 126 | Α   | 160 | Α   | 194       | В   |
| 25. | С  | 59. | В   | 93  | С     | 127 | В   | 161 | All | 195       | С   |
| 26. | Α  | 60. | С   | 94  | В     | 128 | C   | 162 | Α   | 196       | С   |
| 27. | В  | 61. | С   | 95  | В     | 129 | С   | 163 | D   | 197       | Α   |
| 28. | D  | 62. | В   | 96  | B/D   | 130 | A   | 164 | D   | 198       | В   |
| 29. | В  | 63. | В   | 97  | В     | 131 | С   | 165 | All | 199       | В   |
| 30. | В  | 64. | А   | 98  | В     | 132 | D   | 166 | С   | 200       | С   |
| 31. | D  | 65. | С   | 99  | А     | 133 | В   | 167 | В   |           |     |
| 32. | Α  | 66. | С   | 100 | В     | 134 | С   | 168 | D   |           |     |
| 33. | Α  | 67. | Α   | 101 | C/B   | 135 | Α   | 169 | D   |           |     |
| 34. | В  | 68. | В   | 102 | А     | 136 | В   | 170 | D   |           |     |

# PCA UG D Answer key

| Q.  | An | <b>Q</b> . | Ans | Q.  | Answe | Q.  | Ans | <b>Q</b> . | Ans | Q.  | Ans |
|-----|----|------------|-----|-----|-------|-----|-----|------------|-----|-----|-----|
| No. | S  | No.        |     | No. | r     | No. | wer | No.        | wer | No. | wer |
| 1.  | В  | 35.        | С   | 69. | D     | 103 | Α   | 137        | В   | 171 | В   |
| 2.  | В  | 36.        | Α   | 70. | С     | 104 | Α   | 138        | В   | 172 | В   |
| 3.  | С  | 37.        | D   | 71. | С     | 105 | С   | 139        | All | 173 | Α   |
| 4.  | В  | 38.        | А   | 72. | Α     | 106 | С   | 140        | Α   | 174 | С   |
| 5.  | С  | 39.        | D   | 73. | Α     | 107 | В   | 141        | All | 175 | С   |
| 6.  | В  | 40         | А   | 74. | All   | 108 | С   | 142        | В   | 176 | Α   |
| 7.  | D  | 41.        | С   | 75. | D     | 109 | B/D | 143        | С   | 177 | В   |
| 8.  | С  | 42.        | В   | 76. | Α     | 110 | Α   | 144        | В   | 178 | D   |
| 9.  | В  | 43.        | С   | 77. | В     | 111 | All | 145        | С   | 179 | В   |
| 10. | С  | 44.        | В   | 78. | С     | 112 | Α   | 146        | С   | 180 | В   |
| 11. | С  | 45.        | В   | 79. | С     | 113 | D   | 147        | Α   | 181 | D   |
| 12. | В  | 46.        | B/D | 80. | Α     | 114 | D   | 148        | В   | 182 | А   |
| 13. | В  | 47.        | В   | 81. | С     | 115 | All | 149        | В   | 183 | Α   |
| 14. | Α  | 48.        | В   | 82. | D     | 116 | С   | 150        | С   | 184 | В   |
| 15. | С  | 49.        | А   | 83. | В     | 117 | В   | 151        | D   | 185 | Α   |
| 16. | С  | 50.        | В   | 84. | С     | 118 | D   | 152        | С   | 186 | С   |
| 17. | Α  | 51.        | C/B | 85  | А     | 119 | D   | 153        | С   | 187 | Α   |
| 18. | В  | 52.        | А   | 86  | В     | 120 | D   | 154        | Α   | 188 | В   |
| 19. | В  | 53.        | All | 87  | В     | 121 | С   | 155        | В   | 189 | Α   |
| 20. | D  | 54.        | В   | 88  | Α     | 122 | D   | 156        | В   | 190 | D   |
| 21. | Α  | 55.        | D   | 89  | A     | 123 | D   | 157        | Α   | 191 | D   |
| 22. | С  | 56.        | В   | 90  | Α     | 124 | Α   | 158        | В   | 192 | D   |
| 23. | Α  | 57.        | С   | 91  | С     | 125 | С   | 159        | В   | 193 | В   |
| 24. | С  | 58.        | С   | 92  | D     | 126 | D   | 160        | С   | 194 | В   |
| 25. | В  | 59.        | С   | 93  | С     | 127 | D   | 161        | Α   | 195 | С   |
| 26. | С  | 60.        | В   | 94  | D     | 128 | В   | 162        | В   | 196 | С   |
| 27. | В  | 61.        | А   | 95  | В     | 129 | D   | 163        | В   | 197 | С   |
| 28. | В  | 62.        | В   | 96  | All   | 130 | Α   | 164        | Α   | 198 | D   |
| 29. | С  | 63.        | D   | 97  | Α     | 131 | Α   | 165        | D   | 199 | D   |
| 30. | С  | 64.        | А   | 98  | Α     | 132 | С   | 166        | D   | 200 | С   |
| 31. | Α  | 65.        | С   | 99  | Α     | 133 | D   | 167        | С   |     |     |
| 32. | В  | 66.        | D   | 100 | D     | 134 | В   | 168        | В   |     |     |
| 33. | D  | 67.        | А   | 101 | С     | 135 | С   | 169        | Α   |     |     |
| 34. | Α  | 68.        | А   | 102 | D     | 136 | Α   | 170        | В   |     |     |