Sr. No.	Question

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 common
   - (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 other than 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
   - (C) Legumes
   - (D) Grasses
9. A bisexual flower which never opens in its life span is called
   - (A) Cleistogamus
   - (B) Heterogamus
   - (C) Homogamus
   - (D) Dichogamus
10. Quiescent centre is located in
    - (A) Shoot apex
    - (B) Root apex
    - (C) Leaf apex
    - (D) Bud apex
11. Casparian strips occur in the cells of
    - (A) Epidermis
    - (B) Exodermis
    - (C) Endodermis
    - (D) Hypodermis
12. Vascular bundles are absent in
    - (A) Monocots
    - (B) Dicots
    - (C) Gymnosperms
    - (D) Pteridophytes
13. Aerenchyma is derived from
    - (A) Parenchyma
    - (B) Sclerenchyma
    - (C) Phloem
    - (D) Xylem
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 wall layers
    (A) 3   (B) 4
    (C) 5   (D) 6
21. If an endosperm cell of angiosperm has 36 chromosomes, the root cell should have
    (A) 18   (B) 16
    (C) 4   (D) 24
22. Amino acid synthetase enzyme is activated by
    (A) Mg   (B) Cu
    (C) Zn   (D) Fe
23. Number of net gain ATP in aerobic respiration is
    (A) 2   (B) 42
    (C) 38   (D) 41
24. One glucose molecule partially oxidized in anaerobic respiration produces
    (A) 30 ATPs   (B) 38 ATPs
    (C) 2 ATPs   (D) 15 ATPs
25. In forest ecosystem green plants are
    (A) Primary consumers   (B) Primary producers
    (C) Decomposers   (D) None of these
26. The largest cell in the embryo sac is
    (A) Central cell   (B) Egg
    (C) Synergids   (D) None of these
27. Double membrane is absent in
    (A) Mitochondria   (B) Chloroplast
    (C) Peroxisome   (D) Golgi body
28. DNA content is doubled in ------------ stage of cell division
    (A) Prophase   (B) Metaphase
    (C) G_1-phase   (D) S-phase
29. A group of individuals of different species is called
    (A) Population   (B) Community
    (C) Biome   (D) None of these
30. Purines are
    (A) Adenine and Guanine   (B) Guanine and Cytosine
    (C) Thymine and Cytocine   (D) Adenine and Thymine
31. The pigment which is absent in chloroplast is
    (A) Chlorophyll 'a'   (B) Chlorophyll 'b'
    (C) Xanthphyll   (D) Anthocyanine
32. Rate of transpiration is measured by
    (A) Manometer   (B) Potometer
    (C) Auxanometer   (D) None of these
33. The site of primary photochemical reaction is
    (A) Stroma   (B) Grana
    (C) Periplast cavity   (D) Inner layer

34. Father of green revolution in India is
(A)　N. Borlaug　　　　　　　　　　(B)　K.C. Mehta
(C)　M.S. Swaminathan　　　　　　　(D)　None of these

35. Plants which grow in shade are
(A)　Sciophytes　　　　　　　　　　(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 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 production

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. 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. Vallisneria usually favours
(A)　Zoophily　　　　　　　　　　(B)　Entomophily
(C)　Hydrophily　　　　　　　　　　(D)　Anemophily

46. An example of single cell protein is
(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　　　　　　　　　　　　(B)　1902
(C)　1992　　　　　　　　　　　　(D)　1996

49. Lignified cell wall occurs in
(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 average life span of
    (A) 30 days
    (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 only
    (D) Provide support and production of 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 solution
    (A) They will contract and loose water
    (B) They will swell up and burst
    (C) They will show clumping
    (D) None of these
58. In man, urea is formed in the
    (A) Body tissues
    (B) Kidney
    (C) Liver
    (D) Spleen
59. Which of the following stood erect first
    (A) Java man
    (B) Peking man
    (C) Australopithecus
    (D) Cro-Magnon man
60. The first autotrophs on the earth were
    (A) Viruses
    (B) Bacteria
    (C) Green algae
    (D) Blue green algae
61. The 'Use and disuse' principle of evolution was proposed by
    (A) Lamarck
    (B) Weisman
    (C) Hugo de Vries
    (D) Charles Darwin
62. The following is an example of inborn error in metabolism
    (A) Spina bifida
    (B) Phenylketonuria
    (C) Phocomelia
    (D) Mongolism
63. 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
64. The chromosomes are best studied at the following stage of mitosis
    (A) Prophase
    (B) Metaphase
    (C) Anaphase
    (D) Telophase
65. A monosomic individual can be mathematically represented as
    (A) 2n-2
    (B) 2n+1
    (C) 2n-1
    (D) 2n-4

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 eyed
    (B) All white eyed
    (C) Mainly red eyed with a few white eyed
    (D) Mainly white eyed with a few red eyed

67. One of the following is a sex linked trait in humans
    (A) Curly hairs
    (B) Sickle cell anemia
    (C) Colour blindness
    (D) Down's syndrome

68. First experimental evidence for triplet code was given by
    (A) Nirenberg
    (B) H.G. Khorana
    (C) Watson
    (D) F.H.C. Crick

69. Protein coat virus is known as
    (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
    (A) 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
    (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 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 reproductive parts in the same flower
    (A) Papaya
    (B) Datepalm
    (C) Cycas
    (D) Datura

76. Opium is derived from
    (A) Latex of *Papaver somniferum*
    (B) Seeds of *Papaver somniferum*
    (C) Seeds of *Coffee arabica*
    (D) Leaves of datura

77. *Penicillium* was first isolated from
    (A) *Penicillium nigricans*
    (B) *Penicillium chrysogenum*
    (C) *Penicillium notatum*
    (D) *Penicillum griseofulvum*

78. Which of the following is an implant?
    (A) Blood dialyzer
    (B) Heart valve
    (C) Artificial limbs
    (D) Oxygenator

79. Chemical nature of jute fibre is
    (A) Lignin
    (B) Cellulose
    (C) Pectin
    (D) Suberin

80. The conversion of molecular nitrogen to ammonia is known as
    (A) Nitrification
    (B) Denitrification
    (C) Ammonification
    (D) Nitrogen fixation

81. Cocaine is a powerful stimulant of
    (A) Heart beat
    (B) Central nervous system
   (C) Muscles
    (D) Breathing

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 chromosome number
    (A) Colour blindness
    (B) Haemophilia
    (C) Down's syndrome
    (D) Jaundice
86. Ringworm disease is caused by
    (A) Annelid
    (B) Helminthes
    (C) A fungus
    (D) 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
    (A) Ribosome synthesis
    (B) Protein synthesis
    (C) DNA synthesis
    (D) RNA synthesis
89. Dengue is transmitted by
    (A) Culex
    (B) Male anopheles
    (C) Aedes
    (D) Female anopheles
90. Young of cockroach is called
    (A) Ephyra
    (B) Nymph
    (C) Maggot
    (D) Juvenile
91. Number of mitotic divisions required to produce 128 cells from a single cell is
    (A) 7
    (B) 14
    (C) 16
    (D) 32
92. Distance between two adjacent nitrogen bases of DNA is
    (A) 2.4 A°
    (B) 3.4 A°
    (C) 24 A°
    (D) 34 A°
93. In addition to the nucleus, DNA also occurs in
    (A) Mitochondria
    (B) Lysosome
    (C) Ribosome
    (D) Golgi appratus
94. First photosynthetic organisms to develop on earth were
    (A) Bacteria
    (B) Diatoms
    (C) Cyanobacteria
    (D) Green algae
95. The vector for causing sleeping sickness in man is
    (A) House fly
    (B) Tse-Tse fly
    (C) Butterfly
    (D) Mosquito
96. Chromosomes are stained with
    (A) Saffranine
    (B) Acetocarmine
    (C) Sciff's reagent
    (D) Ethanol
97. The universal recipient blood group is
    (A) A
    (B) AB
    (C) O
    (D) B
98. Arsenic pollutant in drinking water causes
    (A) Liver and lung diseases
    (B) Paralysis
    (C) Kidney diseases
    (D) Cancer

99. In the colony of *Apis indica*, the one formed by parthenogenesis is
    (A) Queen (B) Worker
    (C) Drone (D) Both B and C

100. The pollutant responsible for chromosomal mutations 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
    (C) Larger normal force (D) Smaller normal force

102. 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 radially out (D) Moves along the curve

103. A ball of mass 0.2 kg strikes an obstacle and moves at 60^0 to its initial direction. If its speed 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) $3\sqrt{2}$

104. 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
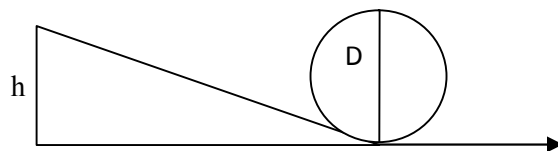   (C) 1500 (D) 1000

105.
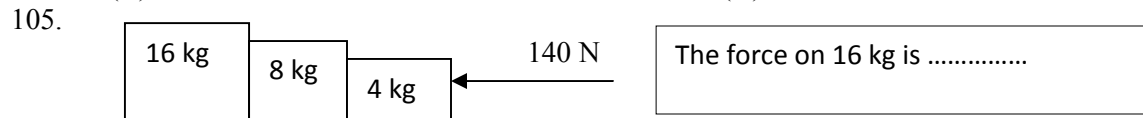
    (A) 140N (B) 120N
    (C) 100N (D) 80N

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)
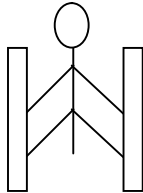
    (A) 100 N (B) 250 N
    (C) 80 N (D) 50 N

107.

Find minimum height in terms of D to complete the loop

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

108. 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

109. A man weighs 75 kg on the surface of earth. His weight 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 vertical 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 rebounds 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 conveyor belt 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 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) $ML^2/9$
    (D) $ML^2/12$

115. If the velocity of C.M of a rolling body is V, then velocity of highest point in the body will be
    (A) $\sqrt{2}V$
    (B) V
    (C) 2V
    (D) $V/\sqrt{2}$

116. The angular momentum of two rotating bodies are equal. If the ratio of their M.I is 1:4, the ratio of their rotational K.E is
    (A) 1:2
    (B) 2:1
    (C) 1:4
    (D) 4:1

117. The level of water in a tank is 5m. A hole 1 cm^2 is made at the bottom. The rate of leakage in m^3/s is (take g= 10 m/s/s)
    (A) 10^{-3}
    (B) 10^{-4}
    (C) 10
    (D) 10^{-2}

118. Two blocks A and B float in water. A floats with 1/4th of its volume immersed and B floats with 3/5th 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 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 cm^2 to exert a force of 10^7 dynes on water. The area of the other piston that supports a mass of 2000 kg is (take g = 10m/s/s)
    (A) 100cm^2
    (B) 10^9 cm^2
    (C) 2 x 10^4 cm^2
    (D) 2 x 10^{10} cm^2

121. When kerosene and coconut oil of coeff. of viscosity 0.002 and 0.0154 Ns/m^2 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 lit
    (B) 6.6 lit
    (C) 7.7 lit
    (D) 8.8 lit

122. There is a circular hole in metal plate. When the plate is heated the radius of the hole becomes
    (A)   increased   (B)   decreased
    (C)   unchanged   (D)   depends on metal

123. Specific heat of a substance depends on 1. Nature of substance. 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

124. In a give process dW=0, dq is <0 then for a gas
    (A)   Temperature increases   (B)   Volume decreases
    (C)   Pressure increases   (D)   Pressure decreases

125. The efficiency of carnot engine depends on
    (A)   Working substance   (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) 7.5×10^{-7}Wb   (B) 1.6×10^{-7}Wb
    (C) 3×10^{-7}Wb   (D) 1.5×10^{-7}Wb

127. 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

128. What in electric system represents force in mechanical system ?
    (A)   L   (B)   I
    (C)   1/C   (D)   q

129. 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

130. An electromagnetic wave is travelling in vacuum with a speed of 3×10^8 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) 1.5×10^8m/s
    (C) 2×10^8m/s   (D)   No change

131. 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.
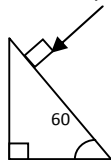
   (A)   30   (B)   45
    (C)   60   (D)   75

132. 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

133. 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

134. 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

135. 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) $1227A°$

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

138. Identify the logic operation performed by this circuit

A

B
    (A) AND
    (B) OR
    (C) NAND
    (D) NOR

139. The number of silicon atoms per m^3 is 5×10^{28}. This is doped simultaneously with 5×10^{22} atoms per m^3 of arsenic and 5×10^{20} atoms per m^3 of indium. Calculate the number of holes, given that $n_i = 1.5 \times 10^{16}$ m^{-3}.
    (A) $4.54 \times 10^9 m^{-3}$
    (B) $4.95 \times 10^{22} m^{-3}$
    (C) $1.5 \times 10^{16} m^{-3}$
    (D) $5 \times 10^{28} m^{-3}$

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) $4.5 \times 10^5 NC$
    (C) $4.5 \times 10^{-5} N/C$
    (D) $4.5 \times 10^{-5} NC$

141. If the Gaussian surface is so chosen that there are some charges inside and some outside 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
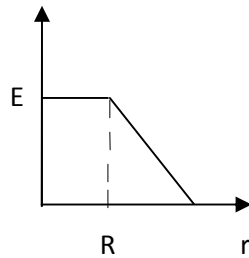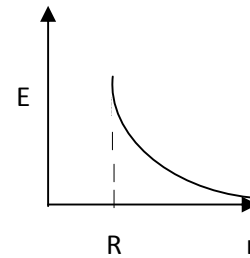
(A)

E

R   r

(B)

E

R   r

(C)

E

R   r

(D)

E

R   r
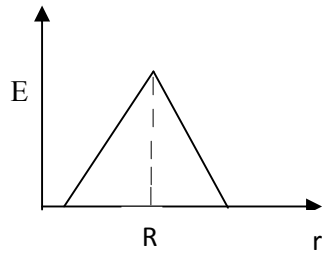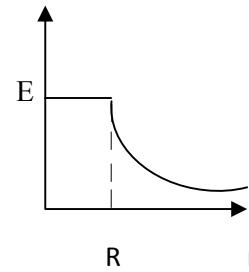
143. Net capacitance of 3 identical capacitor in series is 1 μF. What is the net capacitance in μF if connected in parallel?
(A)   3
(C)   9
(B)   6
(D)   12

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
(C)   0.5s
(B)   1s
(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
(C)   2
(B)   1
(D)   3

146.

Find current in the following circuit

2 Ω

1 Ω

5 Ω

4 Ω

2 Ω
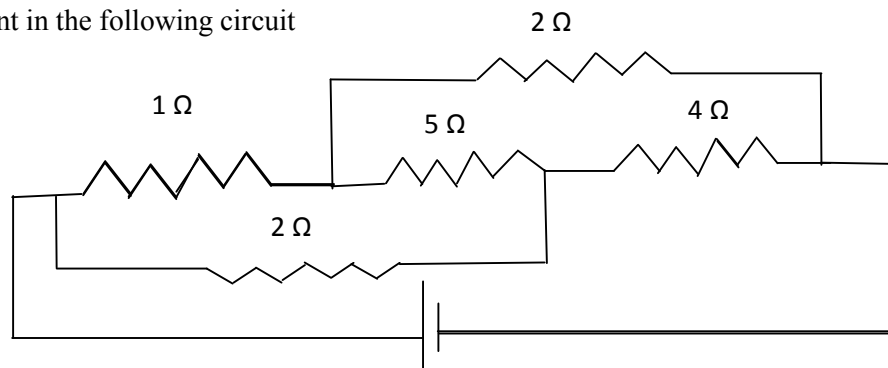
(A)   1A
(C)   3A
(B)   2A
(D)   4A

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 B at the midpoint of the axis between them if same current I flows through both loops.
(A) $\mu_0 I/2^{3/2} r$
(B) $\mu_0 2I/2^{3/2} r$
(C) $\mu_0 I/4\pi\, r$
(D) Cannot be determined

148. 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

149. 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

150. 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

151. 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) $[Fe\,(Cl)_6]^{3-}$

152. 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

153. 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_3
(B) A_3BO
(C) AB_3O
(D) $A_3B_3O_3$

154. 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
(B) At specific composition methanol acetone mixture will form maximum 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
(D) At specific composition methanol acetone mixture will form maximum boiling azeotrope and show negative deviation from Raoult's law

155. K_H value for argon, carbon dioxide, formaldehyde and methane gases are 40.39, 1.67, 1.83 X 10^{-5} and 0.413, respectively. The correct arrangement of these gases in the order of their increasing solubility is:
(A) formaldehyde<methane<carbon dioxide<argon
(B) formaldehyde< carbon dioxide <methane<argon
(C) argon<carbon dioxide< methane<formaldehyde
(D) argon <methane <carbon dioxide <formaldehyde

156. 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

157. The positive value of the standard electrode potential 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_2 couple
   (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 decomposition by bacterial action. The decrease in 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 possessing sufficient energy
   (D) The introduction of an alternative pathway with greater activation energy.

159. Which of the following statements is not correct?
   (A) The rate of a reaction decreases with passage of time as concentration of reactants decrease
   (B) The instantaneous rate a reaction is same at any time during the reaction
   (C) For a zero order reaction the 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 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)

161. 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

162. 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

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) ClO_3^- and SO_3^{2-}

164. Which of the following hydrides is the strongest reducing agent?
   (A) NH_3
   (B) PH_3
   (C) AsH_3
   (D) SbH_3

165. Consider the reactions,

    i. $Zn + Conc.\ HNO_3\ (hot) \longrightarrow Zn\ (NO_3)_2 + X + H_2O$

    ii. $Zn + dil.\ HNO_3\ (cold) \longrightarrow Zn\ (NO_3)_2 + Y + H_2O$

    Compounds X and Y are, respectively

(A) N_2O, NO   (B) NO_2, NO_2

(C) N_2, N_2O (D) NO_2, NO

166. 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

167. Acidified potassium dichromate solution turns green when Na_2SO_3 is added to it due to the formation of:

(A) $CrSO_4$ (B) $Cr_2(SO_4)_3$

(C) CrO_4^{2-} (D) $Cr_2(SO_3)_3$

168. 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) $[Cr(H_2O)_6]^{2+}$ (B) $[Mn(H_2O)_6]^{2+}$

(C) $[Fe(H_2O)_6]^{2+}$ (D) $[Co(H_2O)_6]^{2+}$

169. When 2-Bromopentane is heated with potassium ethoxide in ethanol, the major product obtained is:

(A) 2-Ethoxypentane   (B) Pent-1-ene

(C) Cis-Pent-2-ene   (D) Trans-Pent-2-ene

170. Which of the following undergoes nucleophilic substitution exclusively by S_N^1 mechnism?

(A) Chloroethane   (B) Isopropyl chloride

(C) Chlorobenzene   (D) Benzyl chloride

171. The number of possible stereoisomers for $CH_3CH=CHCH_2CH(Br)CH_3$ is:

(A) 8   (B) 2

(C) 4   (D) 6

172. 2-Methoxy-2-methylpropane on heating with HI produces:

(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 least acidic compound among the following is:

(A) o-Nitrophenol   (B) m-Nitrophenol

(C) p-Nitrophenol   (D) Phenol

174. An alkene C_7H_{14} on reductive ozonolysis gives an aldehyde with formula C_3H_6O and a ketone. The ketone is:

(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 ii) 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

176. The carboxylic acid that does not undergo Hell-Vohlard-Zelinsky reaction is:
(A) CH_3COOH
(B) $(CH_3)_2CHCOOH$
(C) $CH_3CH_2CH_2COOH$
(D) $(CH_3)_3CCOOH$

177.
$$C_2H_5NH_2 \xrightarrow{NaNO_2/HCl} X \xrightarrow{P/Br_2} Y \xrightarrow[\text{(excess)}]{NH_3} Z$$

In the above sequence, Z is:
(A) cyanoethane
(B) ethanamide
(C) methanamine
(D) ethanamine

178. The attachment of which of the following group at para position in aniline will raise the K_b value?
(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 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 cationic 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:
(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?
(A) NH_3
(B) NH_4^+
(C) PCl_3
(D) SCl_2

188. Which of the following molecule does not exist
(A) NF_3
(B) NF_5
(C) PF_5
(D) N_2H_4

189. If helium is allowed to expand in vacuum, it liberates 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

190. i) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(l)+ x$ KJ   ii) $H_2(g) + 1/2O_2(g) \rightarrow H_2O(g) + y$ KJ; For the given two reactions,
    (A) x>y
    (B) x<y
    (C) x=y
    (D) x+y=0

191. If the bond dissociation energies of XY, X_2, Y_2 (all diatomic molecules) are in the ratio 1:1:0.5, respectively and $\Delta_f H$ of XY is -200KJmol^{-1}, the bond dissociation energy of X_2 will be:
    (A) 400 KJmol^{-1}
    (B) 300 KJmol^{-1}
    (C) 200 KJmol^{-1}
    (D) 100 KJmol^{-1}

192. What will be the correct order of vapour pressure of water, ethanol and ether at 30^0C? Given that 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

193. 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$^+$] will decrease to 0.001M
    (B) pH will decrease
    (C) Percentage ionization will increase
    (D) K_a will increase

194. Which of the following species involves the transfer of $5N_A$ 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-volume hyderogen peroxide means:
    (A) 30% H_2O_2 by volume
    (B) 30g of H_2O_2 solution containing 1g of it
    (C) 1 cm^3 of solution liberates 30 cm^3 of O_2 gas at STP
    (D) 30 cm^3 of the solution contains one mole of H_2O_2

196. The correct sequence of covalent character is represented by:
    (A) LiCl<NaCl<BeCl$_2$
    (B) BeCl$_2$<LiCl<NaCl
    (C) NaCl<LiCl< BeCl$_2$
    (D) BeCl$_2$<NaCl< LiCl

197. Which of the following is known as pyrene?
    (A) CCl$_4$
    (B) CS$_2$
    (C) S$_2$Cl$_2$
    (D) Solid CO$_2$

198. The most 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
    (B) cis-2-Butene
    (C) trans-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
    (B) 2,2-Dimethylbutane
    (C) 2,3-Dimethylbutane
    (D) n-Hexane