Dated : 04-05-2023

M.L. Syal's Helix Institute

S.C.O. 343-345, Top Floor, Sector 34-A, Chandigarh. Ph : 0172-2623155

Test Booklet Code **A**

MM : 720

Test Series [Option-1] for NEET-2023

Time : 3 hrs. 20 min.

Mock Test

PHYSICS : SECTION-A

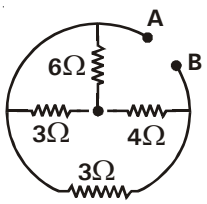
All questions are compulsory in section A

1. A monatomic gas of n-moles is heated from temperature T_1 to T_2 under two different conditions (i) at constant volume and (ii) at constant pressure. The change in internal energy of the gas is
   (1) more for i
   (2) more for ii
   (3) same in both cases
   (4) independent of number of moles

2. An electron falls through a small distance in a uniform electric field of magnitude $2 \times 10^4 NC^{-1}$. The direction of the field is reversed keeping the magnitude unchanged and a proton falls through the same distance. The time of fall will be
   (1) same in both cases
   (2) more in the case of proton
   (3) more in the case of an electron
   (4) independent of charge

3. Two short magnets with their axes horizontal and perpendicular to the magnetic meridian are placed with their centres 40 cm east and 50 cm west of magnetic needle respectively. If the needle remains undeflected, ratio of their magnetic moments is
   (1) 4 : 5
   (2) 16 : 25
   (3) 64 : 125
   (4) $2 : \sqrt{5}$

4. In the circuit shown, the equivalent resistance between A and B is



   (1) 1 Ω
   (2) 2 Ω
   (3) 3 Ω
   (4) 4 Ω

5. In a game of tug of wars, a condition of equilibrium exists. Both the teams pull the rope with a force of 10^4 N. The tension in the rope is
   (1) 10^4 N
   (2) 10^8 N
   (3) zero
   (4) 2×10^4 N

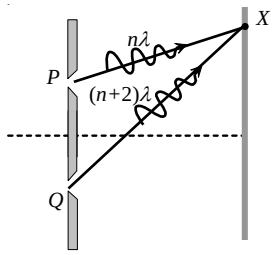
6. The work done by damping force in one complete oscillation is
   (1) zero
   (2) positive
   (3) negative
   (4) may be positive or negative

7. A person is in a room whose ceiling and two adjacent walls are mirrors. How many images are formed?
   (1) 5
   (2) 6
   (3) 7
   (4) 8

8. The distance between the centres of carbon and oxygen atoms in the carbon monoxide gas molecule is 1.2×10^{-8} cm. The centre of mass of the molecule with respect to the carbon atom is
   (1) 0.69×10^{-8} cm
   (2) 1.02×10^{-16} cm
   (3) 0.6×10^{-12} cm
   (4) 0.86×10^{-12} cm

9. If the pressure amplitude in a sound wave is tripled, then the intensity of sound is increased by a factor of
   (1) 9
   (2) 3
   (3) 6
   (4) $\sqrt{3}$

10. The velocity of 800 gm object changes from $3\hat{i} - 4\hat{j}$ to $6\hat{i} + 2\hat{k}$ ms^{-1}. The change in kinetic energy is
    (1) 3 joule
    (2) 6 joule
    (3) 9 joule
    (4) 12 joule

11. 

The figure shows a double slit experiment with slits P and Q . The path lengths PX and QX are $n\lambda$ and $(n+2)\lambda$ respectively, where 'n' is a whole number and λ is the wavelength. Taking the central fringe as zero, what is formed at X?

(1) First bright
(2) First dark
(3) Second bright
(4) Second dark

12. Escape velocity of a body projected at an angle of 30° with horizontal from the surface of earth is
(1) 22.4 km/s
(2) 8 km/s
(3) 5.6×1.73 km/s
(4) 11.2 km/s

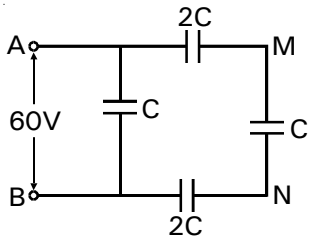
13. A hydrogen atom is in an excited state and the number of spectral lines observed is found to be 6. Then the radius of the orbit of electron in this excited state is about (radius in ground state is 0.5 Å)
(1) 4 Å
(2) 6 Å
(3) 3 Å
(4) 8 Å

14. Two bodies, one held 0.98 m vertically above other, are released simultaneously and fall freely under gravity. After 2s, their relative separation is
(1) 0.98 m
(2) 19.6 m
(3) 9.8 m
(4) 4.9 m

15. Speed of sound wave is v. If a reflector moves towards a stationary source emitting waves of frequency f with speed u, the frequency of reflected wave for a stationary observer will be
(1) $\frac{v-u}{v+u}f$
(2) $\frac{v+u}{v}f$
(3) $\frac{v+u}{v-u}f$
(4) $\frac{v-u}{v}f$

16. In a plano-convex lens the radius of curvature of the convex lens is 10 cm. If the plane side is polished, then the focal length will be (Refractive index = 1.5)
(1) 10.5 cm
(2) 10 cm
(3) 5.5 cm
(4) 5 cm

17. On a rough horizontal surface, a body of mass 2 kg is given a velocity of 10 m/s. If the coefficient of friction is 0.2, the body will stop after covering a distance of
(1) 10 m
(2) 25 m
(3) 50 m
(4) 250 m

18. 

In the shown circuit, a potential difference of 60V is applied across AB. The potential difference between the points M and N is
(1) 10V
(2) 15V
(3) 20V
(4) 30V

19. **Assertion** : A man in a car moving in a circle with uniform speed throws a ball vertically upward. The ball falls outside of the circular path.

Reason : Ball experiences a centrifugal force in the above case as seen by a man on the ground.

(1) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(2) Assertion is true statement but Reason is false
(3) Assertion is false
(4) Both Assertion and Reason are true and the reason is the correct explanation of the assertion

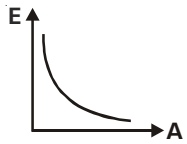
20. The frequency of vibration of string is given by $\nu = \frac{p}{2L}\sqrt{\frac{F}{m}}$. Here p is number of segments in the string, F is force and L is length. The dimensional formula for 'm' will be
(1) $[M^1L^2T^{-1}]$
(2) $[ML^{-1}T^0]$
(3) $[M^0L^1T^{-2}]$
(4) $[ML^0T^{-1}]$

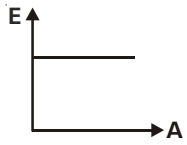
21. 50 gm of copper is heated to increase its temperature by 10°C. If the same quantity of heat is given to 10 gm of water, the rise in its temperature is (Specific heat of copper = 420 Joule-kg^{-1} °C^{-1})
(1) 5°C
(2) 6°C
(3) 7°C
(4) 8°C

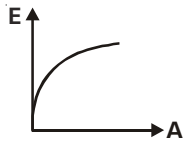
22. Suppose the wavelength of the incident light is increased from 3100 to 2480 Å. Find the corresponding change in the stopping potential in a photoelectric experiment.
(1) 0.5 V
(2) 1 V
(3) 0.75 V
(4) 1.5 V

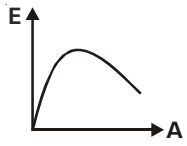
23. A helicopter is flying along south with the speed of 50 km/h. A train is moving with same speed towards east. The relative velocity of helicopter as seen by passengers in the train will be towards
(1) north-east
(2) south-east
(3) north-west
(4) south-west

24. The graph between the binding energy per nucleon (E) and mass number (A) of nuclei is best represented by

(1) 

(2) 

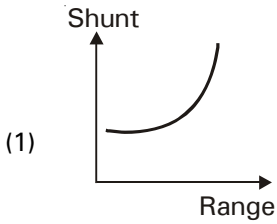
(3) 

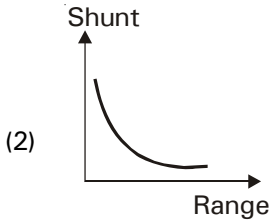
(4) 

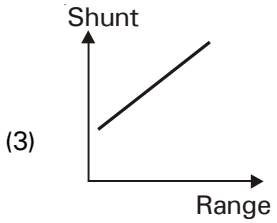
25. By what percent the kinetic energy of a satellite will be changed if it is shifted from an orbit of radius 'r' to an orbit of radius 2r?
(1) + 50%
(2) – 50%
(3) – 100%
(4) + 100%

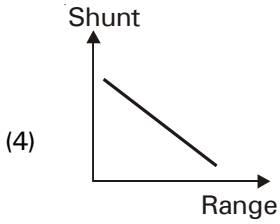
26. A car accelerates from rest at constant rate of 2 m/s^2 for sometime. Then, it retards at constant rate of 4 m/s^2 and comes to rest. If the total time for which it remains in motion be 3 s, what is total distance travelled?
(1) 2 m
(2) 3 m
(3) 4 m
(4) 6 m

27. The graph between the range of an ammeter and the required shunt resistance for this purpose is best represented by

(1) 

(2) 

(3) 

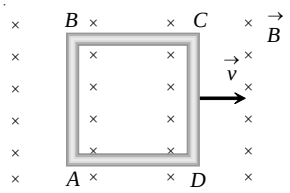
(4) 

28. A uniform disc of radius R is released from horizontal position to rotate in vertical plane about an axis through its rim and perpendicular to its plane. Its angular acceleration at the time of releasing is
(1) $\frac{g}{R}$
(2) $\frac{4g}{5R}$
(3) $\frac{g}{2R}$
(4) $\frac{2g}{3R}$

29. 60% of total kinetic energy of a rolling body is translational. Then the body may be a
(1) hollow cylinder
(2) solid sphere
(3) hollow sphere
(4) solid Cylinder

30. A sinusoidal ac current flows through a resistor of resistance R. If the peak current is I_p, then the power dissipated is (θ is the phase difference between voltage and current)
(1) $I_p^2 R\cos\theta$
(2) $\frac{1}{2}I_p^2 R$
(3) $\frac{1}{2}I_p^2 R\cos\theta$
(4) $\frac{1}{\pi}I_p^2 R$

31. A particle is projected so as to have the trajectory $y = x - \frac{gx^2}{400}$, then its initial speed is
(1) 10 m/s
(2) 20 m/s
(3) 100 m/s
(4) 40 m/s

32. 

A conducting square loop of side L and resistance R moves in its plane with a uniform velocity v perpendicular to one of its sides and passes through a region with uniform magnetic induction B, pointing into the plane of the loop as shown. The current induced when the loop is entering the magnetic field is
(1) $\frac{BLv}{R}$ anticlockwise
(2) $\frac{BLv}{R}$ clockwise
(3) $\frac{2BLv}{R}$ anticlockwise
(4) Zero

33. What is the approximate de Broglie wavelength associated wth an electron, accelerated through a potential difference of 150 volts?
(1) 0.6 nm
(2) 0.1 nm
(3) 1.2 nm
(4) 0.9 nm

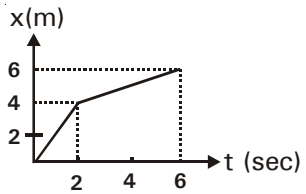
34. A projectile of mass 100 g is thrown vertically upwards with a speed 40 m/s. What is instantaneous power developed by gravity at t = 1 s?
(1) −40 W
(2) −10 W
(3) −30 W
(4) zero

35. Angular width of central maxima in the Fraunhoffer diffraction pattern of a slit is measured. The slit is first illuminated by light of wavelength 6000 Å. When the slit is illuminated by light of another wavelength, the angular width decreases by 30%. The wavelength of this light will be
(1) 6000 Å
(2) 4200 Å
(3) 3000 Å
(4) 1800 Å

PHYSICS : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

36. In the figure given below, the position-time graph of a particle of mass 0.1 kg is shown. The impulse at t = 2 sec is



(1) 0.1 kg m/s
(2) −0.1 kg m/s
(3) 0.15 kg m/s
(4) −0.15 kg m/s

37. A circular coil of area 10 cm^2 and of 20 turns carries a current of 3 amperes. It is placed in a magnetic field of intensity of 0.5 Wb/m^2 with the plane of coil at 30° to direction of the field. The potential energy of the coil may be
(1) 0.015 J
(2) 0.03 J
(3) 0.026 J
(4) zero

38. An alternating voltage is given by
$e = e_1 \sin\omega t + e_2 \cos\omega t$
Then the root mean square value of voltage is given by
(1) $\sqrt{e_1^2 + e_2^2}$
(2) $\sqrt{e_1 e_2}$
(3) $\sqrt{\frac{e_1 e_2}{2}}$
(4) $\sqrt{\frac{e_1^2 + e_2^2}{2}}$

39. Surface tension of a soap solution is 1×10^{-2} N/m. Work done in blowing a soap bubble of 1 cm radius is
(1) $4\pi \times 10^{-6}$ J
(2) $\pi \times 10^{-6}$ J
(3) $8\pi \times 10^{-6}$ J
(4) $2\pi \times 10^{-6}$ J

40. 6 moles of an ideal monoatomic gas is mixed with 4 moles of diatomic gas. Then the molar specific heat (constant volume) for the mixture is
(1) 1.9 R
(2) 1.4 R
(3) 2 R
(4) 1.5 R

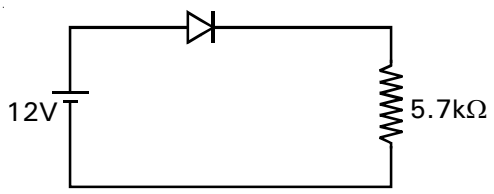
41. A current carrying straight wire is kept along the axis of a square loop carrying a current. The straight wire will exert
(1) an inward force on the square loop
(2) an outward force on the square loop
(3) no force on the square loop
(4) a force on square loop parallel to itself.

42. Two forces, each of magnitude F have a resultant of the magnitude $\sqrt{3}$ F. The angle between the two forces is
(1) 45°
(2) 120°
(3) 150°
(4) 60°

43. Colour of the sky is blue because
(1) red light in sunlight is scattered the most
(2) blue light in sunlight is scattered the most
(3) red light in sunlight is deviated the most
(4) blue light in sunlight is deviated the most

44. The distance of the centres of two particles P and Q is 10D. The mass of P is 16 times the mass of Q. At what distance from P, the gravitational field due to these will be zero?
(1) 5 D
(2) 8 D
(3) 9 D
(4) 2 D

45. In the circuit, the voltage drop on the p-n junction is 0.6 V. The current flowing in the circuit is (diodes are ideal)



(1) 2.21 mA
(2) 2 mA
(3) 2.11 mA
(4) 1.9 mA

46. A bomb of 12 kg divides in two parts whose ratio of masses is 1 : 3. If kinetic energy of smaller part is 216 J, then momentum of bigger part will be
(1) 36 kg-m/s
(2) 72 kg-m/s
(3) 108 kg-m/s
(4) 24 kg-m/s

47. A tyre inflated to 3 atm pressure at 300 K explodes. The temperature of escaping gas will be (take $\gamma = 1.5$)
(1) 300 $(1/3)^3$ K
(2) 300 $(3)^{1/3}$ K
(3) 100 K
(4) 300 $(3)^{-1/3}$ K

48. **Statement-I** : 90 dB sound is 10^5 times more intense than 40 dB sound.
Statement-II : Pressure wave and displacement wave in sound have phase difference of $\frac{\pi}{2}$.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

49. A beaker containing water is kept in an elevator accelerating upward at 'a'. The pressure inside water at a depth h is (ρ is the density of water and P_a is atmospheric pressure)
(1) $P_a + h\rho g$
(2) $P_a + h\rho (g + a)$
(3) $P_a + h\rho (g - a)$
(4) $h\rho (g + a)$

50. Wavelength of electromagnetic wave with a frequency 9 MHz is
(1) 30 m
(2) 9 m
(3) 90 m
(4) 33.3 m

CHEMISTRY : SECTION-A

All questions are compulsory in section A

51. Which one of the following complexes is diamagnetic in nature?
(1) $[Cr(NH_3)_6]^{3+}$
(2) $[FeF_6]^{3-}$
(3) $[Fe(CN)_6]^{4-}$
(4) $[Fe(H_2O)_6]^{2+}$

52. In a certain reaction, 10% of the reactant decomposes in 1 hr., 20% in 2 hr., 30% in 3hr. and so on. The dimensions of the rate constant is
(1) hr^{-1}
(2) mol L^{-1} hr^{-1}
(3) L^1 mol^{-1} hr^{-1}
(4) mol hr^{-1}

53. The activation of the benzene ring by the amino group in aniline towards electrophilic substitution reactions is reduced by treating it with
(1) CH_3COOH
(2) CH_3COCl
(3) Dil. HCl
(4) CH_3I

54. Which of the following does not give a white precipitate with ammonical $AgNO_3$ solution.
(1) Propyne
(2) But-1-yne
(3) 3-Methyl but-1-yne
(4) But-2-yne

55. Total volume occupied by spheres in a face centred cubic unit cell of a metal is (r is at radius)
(1) $\frac{12}{3}\pi r^3$
(2) $\frac{16}{3}\pi r^3$
(3) $\frac{20}{3}\pi r^3$
(4) $\frac{24}{3}\pi r^3$

56. Density of a gas is found to be 5.46 g/dm^3 at 27°C at 2 bar pressure. What will be its density at STP?
(1) 2.73 g/dm^3
(2) 3 g/dm^3
(3) 6 g/dm^3
(4) 1.5 g/dm^3

57. Among the following molecules/ions which one is diamagnetic?
(1) C_2^{2-}
(2) N_2^{2-}
(3) O_2^-
(4) O_2

58. The standard reduction potential, E^o, for the half reactions are as
$Zn^{2+} + 2e^- \rightarrow Zn$; $E^o = -0.76$ volt
$Fe^{2+} + 2e^- \rightarrow Fe$; $E^o = -0.41$ volt
The emf of the cell
$Fe^{2+} + Zn \rightarrow Zn^{2+} + Fe$ is
(1) +0.35 volt
(2) – 0.35 volt
(3) +1.17 volt
(4) – 1.17 volt

59. When C_2H_5Br is treated with limited amount of alc. NH_3, the major product obtained is
(1) Ethylamine
(2) Diethylamine
(3) Triethylamine
(4) Tetraethylammonium bromide

60. When H_2O combines with H^+, H_3O^+ is formed. The orbital used by oxygen to form bond with H^+ is
(1) s-orbital
(2) p-orbital
(3) sp^2-orbital
(4) sp^3-orbital

61. Anhydride of Hypochlorous acid is
(1) Cl_2O
(2) ClO_2
(3) Cl_2O_5
(4) ClO_3

62. Lithium nitrate, on heating gives
(1) $Li_2O + NO_2 + O_2$
(2) O_2
(3) NO_2
(4) $LiNO_2$

63. The coloured discharge tubes for advertising mainly contain
(1) Helium
(2) Argon
(3) Neon
(4) Xenon

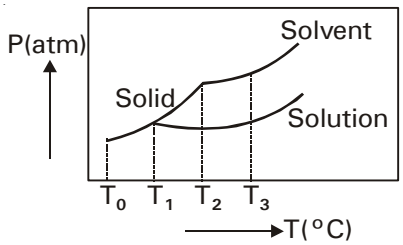
64. The correct order of increasing C–O bond length of CO, CO_3^{2-}, CO_2 is
(1) $CO_3^{2-} < CO_2 < CO$
(2) $CO_2 < CO_3 < CO$
(3) $CO < CO_3^{2-} < CO_2$
(4) $CO < CO_2 < CO_3^{2-}$

65. Total number of orbitals associated with third shell will be
(1) 2 (2) 4
(3) 9 (4) 3

66. If K_1 and K_2 are equilibrium constants for reactions (I) and (II) respectively for
$N_2 + O_2 \rightleftharpoons 2NO$ ...(i)
$\frac{1}{2}N_2 + \frac{1}{2}O_2 \rightleftharpoons NO$ ...(ii) then....
(1) $K_2 = K_1$
(2) $K_2 = \sqrt{K_1}$
(3) $K_1 = 2K_2$
(4) $K_1 = (\frac{1}{2})K_2$

67. D-glucose rotates plane polarized light, this is due to
(1) Molecular asymmetry
(2) Inversion
(3) Achiral carbon
(4) Racemisation

68. **Assertion** : van der Waal's radius of an element is always larger than its covalent radius.
Reason : van der Waal's forces of attraction are weak which result in large inter nuclear distances.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

69.


What is the normal freezing point of the solution represented by the above phase diagram?
(1) T_1
(2) T_2
(3) T_3
(4) T_0

70. Phenol is less acidic than _____.
(1) ethanol
(2) *o*-nitrophenol
(3) *o*-methylphenol
(4) *o*-methoxyphenol

71. Which of the following group of d-block does not contain transition element?
(1) group-12
(2) group-11
(3) group-7
(4) group-10

72. Low density polythene is prepared by
(1) cationic polymerisation
(2) free radical polymerisation
(3) anionic polymerisation
(4) coordination polymerisation

73. Which of the following represents Sabatier's and Sendersen's reaction?
(1) $R-X \xrightarrow{Zn,\ HCl}$
(2) $R-X \xrightarrow{Na,\ Dry\ ether}$
(3) $R-X \xrightarrow{Zn,\ Dry\ ether}$
(4) $R-CH=CH_2 \xrightarrow{Ni,\ 523\text{-}573\ K}$

74. For estimation of phosphorous, phosphorous is converted to _____
(1) $MgClO_4$
(2) $Mg_3(PO_4)_2$
(3) $Mg_2P_2O_7$
(4) $MgCl_2$

75. Which of the following particulates is non viable?
(1) Bacteria
(2) Algae
(3) Smoke
(4) Fungi

76. Peptisation is a process of
(1) precipitating the colloidal particles
(2) purifying the colloidal solution
(3) dispersing precipitate into colloidal solution
(4) movement of colloidal particles towards the oppositely charged electrodes

77. An ore after levigation is found to have basic impurities. Which of the following can be used as a flux?
(1) MgO
(2) $CaCO_3$
(3) SiO_2
(4) FeO

78. **Statement-I** : $\wedge^{o}_{eq}$ for $Ba(OH)_2$ is the sum of 3 terms of λ^{o}_{eq} , one of Ba^{2+} and two of OH^- ions.
Statement-II : 1 mole of $Ba(OH)_2$ gives 3 moles of ions .
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

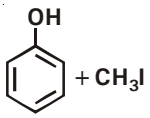
79. The reagent that gives an orange precipitate with acetaldehdye is
(1) Na_2CO_3
(2) NaOH
(3) 2, 4 DNP
(4) NH_2OH

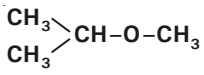
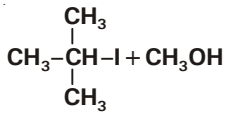
80. I. $[Co_2(CO)_8]$
II. $[Mn_2(CO)_{10}]$
Incorrect statement regarding the above two complexes is
(1) I contains metal-metal bond
(2) II contains metal-metal bond
(3) II contain bridged carbonyl group
(4) I contain both metal-metal bond and bridged carbonyl group

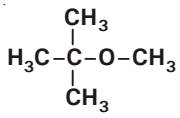
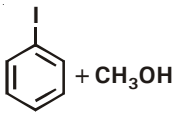
81. The pure hydrogen (99.9%) can be made by which of the following processes?
(1) Mixing natural hydrocarbons of high molecular mass
(2) Electrolysis of water containing $Ba(OH)_2$
(3) Reaction of metal hydrides with H_2O
(4) Reaction of methane with steam

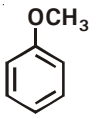
82. Match the starting materials given in Column I with the products formed by these (Column II) in the reaction with aqueous HI.

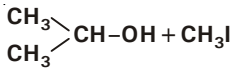
Column I **Column II**

(i) CH_3-O-CH_3 (a) 

(ii)  (b) 

(iii)  (c) 

(iv)  (d) $CH_3-OH + CH_3-I$

(e) 

(1) i–d, ii–e, iii–b, iv–a
(2) i–e, ii–f, iii–c, iv–b
(3) i–a, ii–e, iii–c, iv–b
(4) i–b, ii–d, iii–c, iv–a

83. **Statement-I** : In interhalogen compounds, as the ratio between radii of X and X′ increases, the number of atoms per molecule also increases.
Statement-II : Interhalogens are covalent molecules and are paramagnetic in nature.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

84. 4.4 g of CO_2 and 2.24 litre of H_2 at STP are mixed in a container. The total number of molecules present in the container will be
(1) 6.022×10^{23}
(2) 1.2044×10^{23}
(3) 2 mole
(4) 6.023×10^{24}

85. When methyl chloride reacts with silicon in the presence of copper as a catalyst at a temperature of 573 K the product formed contains
(1) $MeSiCl_3$
(2) Me_2SiCl_2
(3) Me_3SiCl
(4) mixture of 1, 2 & 3

CHEMISTRY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

86. The minimum volume of water required to dissolve 1 g of calcium sulphate at 298K. [K_{sp} of calcium sulphate $= 9.1 \times 10^{-6}$]
(1) 1 L
(2) 3.43 L
(3) 1.78 L
(4) 2.45 L

87. Which of the following amines give carbylamine reaction
(1) aniline
(2) N-methylaniline
(3) N, N-dimethylamine
(4) dimethylamine

88. **Assertion** : Acetic acid does not undergo haloform reaction.
Reason : Acetic acid has no alpha-hydrogen.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

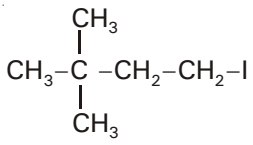
89. Which of these will form minimum boiling azeotrope?
(1) $HCl + H_2O$
(2) $CHCl_3$ + acetone
(3) $HNO_3 + H_2O$
(4) $C_2H_5OH + H_2O$

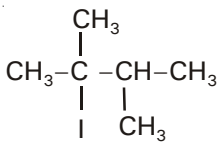
90. What is the relation between 3-ethyl pentane and 3-methylhexane?
(1) Chain isomers
(2) Position isomers
(3) Functional isomers
(4) Metamers

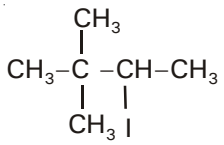
91. Which kind of defects are introduced by doping?
(1) Dislocation defect
(2) Schottky defect
(3) Frenkel defects
(4) Electronic defects

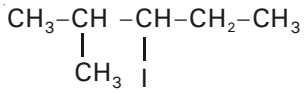
92. When acidified $K_2Cr_2O_7$ solution is added to Sn^{2+} salts then Sn^{2+} changes to
(1) Sn
(2) Sn^{3+}
(3) Sn^{4+}
(4) Sn^{+}

93. $(CH_3)_3C-CH=CH_2 \xrightarrow{HI} (A)$.
The major product (A) is

(1) 

(2) 

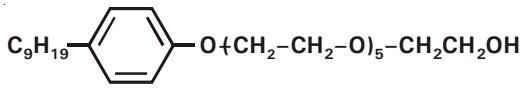
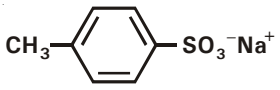
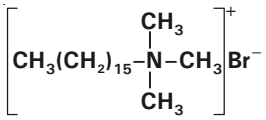
(3) 

(4) 

94. Match the column I with column II

i.	pH	a.	$q=0$
ii.	Adiabatic	b.	$w=0$
iii.	Mass	c.	extensive
iv.	$P_{ext}=0$	d.	intensive

(1) i-d, ii-a, iii-c, iv = b (2) i-c, ii-a, iii-d, iv = b
(3) i-d, ii-a, iii-b, iv = c (4) i-a, ii-b, iii-c, iv = d

95. Which of the following is an example of liquid dishwashing detergent?
(1) $CH_3(CH_2)_{10}-CH_2OSO_3^- Na^+$
(2) 
(3) 
(4) 

96. **Statement-I** : 1 mol of H_2SO_4 is neutralized by 2 mol of NaOH but 1 equivalent of H_2SO_4 is neutralised by 1 equivalent of NaOH.
Statement-II : Equivalent amount of H_2SO_4 is the quantity that furnishes 2 mole of H^+.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

97. What is not true for Z
(1) $Z=\frac{PV_{real}}{nRT}$
(2) $Z=\frac{V_{real}}{V_{ideal}}$
(3) $Z=1$ at Boyle point for all pressures
(4) Z is a measure of deviations from ideal behaviour

98. The molecule containing two "single super electron pair"
(1) SO_2
(2) CO_2
(3) XeO_2F_2
(4) all of these

99. Heating $MgCl_2.6H_2O$ forms
(1) $MgCl_2$ and H_2O
(2) MgO; HCl; H_2O
(3) $Mg(OH)_2$ and HCl
(4) $Mg(OH)_2$ and Cl_2

100. Which of the following has the highest molar conductivity in solution?
(1) $[Pt(NH_3)_6]Cl_4$
(2) $[Pt(NH_3)_5Cl]Cl_3$
(3) $[Pt(NH_3)_4Cl_2]Cl_2$
(4) $[Pt(NH_3)_3Cl_2]Cl$

ZOOLOGY : SECTION-A

All questions are compulsory in section A

101. Identify the incorrect match
(1) Sponges : mostly asymmetrical
(2) Triploblastic : Platyhelminthes to chordates
(3) Coelomates–Aschelminthes to chordates
(4) Platyhelminthes–organ level of organization

102. Match the column

	Column-I	Column-II
(i)	T-DNA	(A) Collection of DNA threads
(ii)	Biolistic	(B) Fragments collected in gel
(iii)	Bands of DNA	(C) Microparticles of gold
(iv)	Spooling	(D) Ti plasmid

(1) (i)–D, (ii)–C, (iii)–B, (iv)–A
(2) (i)–A, (ii)–B, (iii)–C, (iv)–D
(3) (i)–B, (ii)–A, (iii)–C, (iv)–D
(4) (i)–C, (ii)–B, (iii)–A, (iv)–D

103. In the embryonic development, sequence of formation of heart, development of limbs & digits and the formation of major organ systems occur in
(1) 1st, 2nd and 4th month
(2) 2nd, 3rd and 4th month
(3) 1st, 2nd and 3rd month
(4) 3rd, 4th and 5th month

104. Which of the following is correct for a myofibril ?
(1) Many sarcomeres are arranged serially in each myofibril
(2) It contains many parallely arranged myofibres
(3) Each sarcomere in a myofibril is made up of two half 'A' bands and a central I-band
(4) It is an anatomical unit of a muscle

105. The type of antibodies and the type of immunity provided by colostrum to the infant are respectively
(1) Ig G, passive
(2) Ig A, active
(3) Ig M, active
(4) Ig A, passive

106. During exercise both the number of beats per minute & the amount of blood pumped per beat are greatly increased. This results in
a. increased stroke volume
b. increased cardiac output
c. increased heart rate
d. increased duration of cardiac cycle
(1) a, b & c
(2) a, b & d
(3) b, c & d
(4) a, c & d

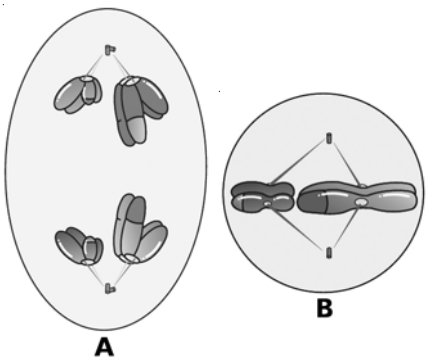
107. **Assertion** : If any piece of desirable DNA is some how transferred into a suitable host, most likely, this piece of DNA would not be able to multiply itself in the progeny cells of host.
Reason : For the multiplication of any alien piece of DNA in a host, it needs to be a part of chromosome which has a specific sequence known as *ori*.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

108. Bond(s) found in nucleic acids is/are
(1) glycosidic bond
(2) ester bond
(3) phosphodiester bond
(4) all of these

109. Total volume of air a person can expire after normal inspiration is_____.
(1) EC, 1600 ml/breath
(2) FRC, 2100 ml/breath
(3) IC, 3500 ml breath
(4) VC, 3000 ml/breath

110. Which of the following is a correct matching of the site of action, substrate, its enzymes and products produced by it?
(1) Pancreas : protein, trypsin, peptides
(2) Stomach : starch, amylase, glucose
(3) Small intestine : fats, lipase, fatty acids and glycerol
(4) Duodenum : protein, ptyalin, amino acids

111. Correct difference between A and B is



	A	B
(1)	show separation of sister chromatids	– Spindle fibres attach to homologous chromosomes
(2)	Involves splitting of centromeres	– Show bivalents
(3)	Homologous chromosomes separate	– Spindle attach to kinetochores of sister chromatids
(4)	Represents anaphase-II	– Represents metaphase-II

112. A molecule X is diffusing faster through cell membrane, but molecule Y is facilitated by certain molecules Z. What are X, Y and Z?
(1) X - protein, Y - lipid, Z - carbohydrates
(2) X - lipid, Y - polar molecule, Z - protein
(3) X - hydrophilic sybstance, Y - lipid, Z - carbohydrates
(4) X - protein, Y - carbohydrates, Z - hydrophilic sybstance

113. Choose the incorrect match
(1) Darwin - Galapagos island
(2) Wallace - Malay Archepelago
(3) Hardy-Weinberg - Genetic equillibrium
(4) Lederberg -Industrial melanism

114. Select the incorrect option
(1) Scotopic vision –Rod cells
(2) Circular muscles of iris –Dilators
(3) Fovea centralis –cones are desely packed
(4) Space between cornea and lens –Aqueous chamber

115. Identify the incorrect statement
(1) DNA or RNA segment tagged with a radioactive molecule is called probe
(2) Commonly used vectors for human genome sequencing are BAC and YAC
(3) Two core techniques of modern biotechnology are genetic engineering and bioprocess engineering
(4) Consumption of golden rice can prevent blindness associated with vitamin D deficiency

116. Which hormone plays a major role in the differentiation of T-lymphocytes?
(1) Thymosins
(2) Interleukins
(3) Thyroxine
(4) Lymphokines

117. Identify correct match among the following

	Organelle	Functions	Exception
(1)	SER	Glycogenolysis, gluconeogenesis, calcium storage	Calcium storage
(2)	Golgi apparatus	Glycosylation, cell plate formation, forms acrosome	Glycosy-lation
(3)	Lysosomes	Suicidal bags, digestion of microbes, helps in endocytosis	Suicidal bags
(4)	Centriole	Cell division, transforms into basal body, rRNA synthesis	rRNA synthesis

118. Choose the group of venereal diseases
(1) Gonorrhoea, hepatitis B, trichomoniasis
(2) Syphilis, leprosy, AIDS
(3) Genital herpes, chlamydiasis, filariasis
(4) Gonorrhoea, genital warts, tetanus

119. *Salmonella typhi* is
(1) Bacterial parasite in small intestine
(2) Protist parasite in large intestine
(3) Protozoan parasite in small & large intestine
(4) Protozoan parasite neither in small nor in large intestine

120. If *Aurelia, Hydra* and *Ctenoplana* are placed together, which single word can represent them
(1) Exclusively marine
(2) Direct development
(3) Diploblastic
(4) Dioecious

121. One of the following statements is incorrect, identify it
(1) As the filterate passes upward in loop of Henle it gets diluted
(2) DCT helps in maintaining pH and ionic balance in blood
(3) During filteration through glomerular membrane all constituents of blood except proteins pass into the lumen of Bowman's capsule
(4) Tubular secretion helps to maintain ionic balance and pH of body fluids

122. Match the columns

a. causes milk ejection	i. ADH
b. promotes water retention	ii. erythropoietin
c. peptide hormone secreted by kidneys	iii. oxytocin
d. stimulates melanin formation in melanocytes	iv. MSH

(1) a–viii, b–ii, c–i, d–iv
(2) a–iii, b–i, c–ii, d–iv
(3) a–iv, b–iii, c-ii, d–i
(4) a–ii, b–iii, c–i, d–iv

123. Choose the animals with cartilaginous endoskeleton
a. *Carcharodon*
b. *Catla*
c. *Petromyzon*
d. *Clarias*
(1) a and b
(2) b and d
(3) a and c
(4) c and d

124. Mark the incorrect statement out of the given
(1) Tibia and fibula form the knee joint
(2) Both pelvic and pectoral girdles are part of appendicular skeleton
(3) Sacrum and coccyx are formed by fusion of vertebrae
(4) Sacrum is formed by fusion of five vertebrae in adults

125. The plasmid pBR322 has alien DNA inserted at the site of tet^r gene, here the amp^r gene will help in selection of
(1) plasmids
(2) transformants
(3) non-transformants
(4) non-recombinants

126. α-1 antitrypsin is used in case of _____ and is produced as _____
(1) Emphysema, therapeutic agent
(2) Emphysema, prophylactic agent
(3) lung disorder, antibiotic
(4) lung disorder, antibodies

127. Which among the following events are related with S-Phase?
a. DNA content doubles
b. Histone and non histone proteins are synthesised
c. Kinetochore subunits assemble
d. Centrioles duplicate
(1) a, b, c only
(2) b, c and d only
(3) a, c,d only
(4) a, b, c and d

128. **Statement-I** : All secondary metabolites play known role in normal physiological processes of plants and micro-organisms

Statement-II : GLUT-4 is a protein that enables glucose transport into the cells

(1) Both statement-I and statement-II are correct

(2) Both statement-I and statement-II are incorrect

(3) Statement-I is correct but statement-II is incorrect

(4) Statement-I is incorrect but statement-II is correct

129. In cloning of cattle, a fertilised egg is taken out of the mother's womb and

(1) In the eight cells stage the individual cells are separated under electrical field for further development in culture media

(2) In the 8-32 cell stage, small embryos are withdrawn and implanted into the womb of other cows

(3) from this upto eight identical twins can be produced

(4) both (2) and (3)

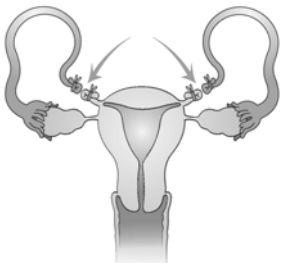
130. Which of the following is an incorrect match?

(1) Progestasert–Makes uterus unsuitable for implantation and cervix hostile to sperms

(2) Oral contraceptive pills–Prevent ovulation and implantation

(3) Mutiload 375–Cu^{2+} suppress motility and fertilizing capacity of sperms

(4) Periodic abstinence –Prevents ovulation and menstruation

131. 

Which of the following statements are correct w.r.t. above figure?

a. Showing vesectomy
b. Showing tubectomy
c. Transport of gametes blocked
d. Surgical method of termination
e. Prevent ovulation

(1) a, c & d
(2) b, c, d & e
(3) b, c & d
(4) a, c, d & e

132. Vaccination given to infant renders

(1) natural active immunity by giving preformed antibodies

(2) acquired active immunity by inducing production of antibodies

(3) acquired passive immunity by inducing production of antibodies

(4) artificial passive immunity by giving antibodies

133. Non membranous organelle which helps in cell division is

(1) centriole
(2) ribosome
(3) nucleous
(4) both (1) & (2)

134. Choose the incorrect statement

(1) in 1983, Eli Lilly company prepared two DNA sequences corresponding to A and C chains of insulin

(2) correction of genetic defect involves delivery of a normal gene into embryo to take over the function of non-functional gene

(3) Adenosine deaminase is crucial for immune system to function

(4) Taq polymerase used in PCR is isolated from bacterium *Thermus aquaticus*

135. Cochlea is divided into three chambers or spaces

a. Scala vestibuli
b. Scala media
c. Scala tympani

Basilar membrane and reissner's membrane are respectively found between

(1) a and c; a and b
(2) a and b; b and c
(3) b and c; a and c
(4) b and c; a and b

ZOOLOGY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

136. Adaptive radiation refers to

(1) power of adaptation in an individual to a variety of environments

(2) evolution of different species from a common ancestor

(3) adaptations due to geographical isolation

(4) migration of members of a species to different geographical areas

137. For micturition to occur all the following would happen except for

(1) contraction of the smooth muscles of bladder

(2) Relaxation of the urethral sphincter

(3) Sensory message from CNS resulting in filling of the bladder

(4) Motor message from CNS to empty the bladder

138. Depolarization and repolarization are mainly due to movement of
(1) Na^+ and K^+ respectively
(2) K^+ and Na^+ respectively
(3) only K^+
(4) only Na^+

139. Choose the correct pair of source and its product which is used for competitively inhibiting the enzyme responsible for cholesterol synthesis.

	Source		Product
(1)	*Trichoderma*	–	statins
(2)	*Monascus*	–	statins
(3)	*Streptococus*	–	cyclosporin A
(4)	*Monascus*	–	streptokinase

140. Which of the following statements are true for evolutionary history of vertebrates?
a. Modern day descendents of early reptiles are turtles, tortoises and crocodiles
b. *Tyrannosaurus* rex was biggest dinosaur
c. ancestors of turtles, lizards and snakes were sauropsids
(1) a and b (2) b and c
(3) a and c (4) a, b and c

141. Which of the following is a correct match ?

(1)	Miller's experimental Flask –	CH_4, NH_3, H_2, H_2O, vapurs at 1800°C
(2)	de Vries mutations –	Random, directionless, minor, inheritable
(3)	Factors disturbing Hardy Weinberg equilibrium –	Gene migration genetic drift, mutations, random mating
(4)	Darwins's finches –	Indicate homology, adaptive radiation, natural selection

142. The phagocytic white blood cells are
(1) neutrophils and monocytes
(2) neutrophils and eosinophila
(3) lymphocytes and macrophages
(4) eosinophils and lymphocytes

143. **Assertion** : Membranes of cisternae of golgi complex show a transition from the cis to the trans face.
Reason : Membranes at the forming face must be more like the plasme membrane for their easy fusion with it than at maturing face.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

144. The study of integration of natural science and organisms, cells, parts thereof and molecular analogues for products and services is called
(1) microbiology
(2) biotechnology
(3) animal husbandary
(4) none of these

145. Identify the correct statements w.r.t. coagulation of blood
a. Enzyme complex thrombokinase is required for activation of prothrombin
b. Fibrin is formed by conversion of inactive fibrinogen by thrombin
c. Enzyme complex thrombokinase is formed by a series of linked enzymatic reactions
d. Certain factors released by tissues at the site of injury can initiate coagulation
(1) a, b & c but not d (2) a, c & d but not b
(3) b, c & d but not a (4) a, b, c & d

146. EcoRI cuts the DNA between bases _____ and _____ only when the sequence GAATTC is present in the DNA
(1) A and A
(2) A and T
(3) G and A
(4) T and C

147. Which of the following is not true about biocontrol of pests?
(1) Dragonflies are useful to get rid of aphids and mosquitoes
(2) *Trichoderma* are free living fungi that are common in the root ecosystems
(3) Baculoviruses have narrow spectrum insecticidal applications
(4) Both (1) and (3)

148. Select the incorrect option
(1) Menstrual phase –Lasts for 3 to 5 days
(2) Proliferation phase–primary follicles grow to form mature Graafian follicle
(3) LH surge –induces rupture of Graafian follicle,
(4) Clitoris –lies at the lower junction of the two labia minora

149. **Statement-I** : Spleen provides micro-environment for development and maturation of T–lymphocytes.
Statement-II : Spleen has a large reservoir of RBC.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

150. Similarity between Lamprey and *Pterophyllum* is that both
(1) belong to classes of phylum chordata with only marine individuals
(2) show internal fertilization
(3) have paired fins for locomotion
(4) have closed circulatory system

BOTANY : SECTION-A

All questions are compulsory in section A

151. Wind pollination is quite common in
(1) Grasses
(2) Water hyacinth
(3) *Hydrilla*
(4) *Zostera*

152. Bryophytes differ from pteridophytes in not having
(1) embryo stage
(2) independent gametophyte
(3) Stalked sex organs
(4) Stem and root

153. *Euglena* shows all, except
(1) mixotrophic nutrition
(2) longitudnal binary fission
(3) pigments identical to those present in higher plants
(4) cell wall with protein rich layer called pellicle

154. The crossing over value between different genes are given. Find the linkage map of them? The crossing over values are ab–10%, bc–7%, ad–2%, cd–19%.
(1) abcd
(2) dabc
(3) cbda
(4) cdab

155. Which one of the following is a xerophytic plant having fleshy cylindrical stem that carry out photo synthesis?
(1) *Opuntia*
(2) *Euphorbia*
(3) Zaminkand
(4) *Bougainvillea*

156. A wall-less Moneran which can survive without oxygen is
(1) Bacteria
(2) Archaebacteria
(3) Mycoplasma
(4) Cyanobacteria

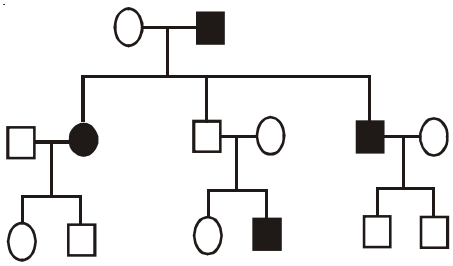
157. Rivet popper hypothesis proposed by Paul Ehlrich is for
(1) the effect of decrease in biodiversity on the ecosystem
(2) the effect of increase in biodiversity on the ecosystem
(3) alien species invasions
(4) over exploitation

158. Viruses
a. are non-cellular organisms
b. have inert crystalline structure outside living cell
c. can take over machinery of host cell
d. are living prokaryotes
e. did not find a place in classification
(1) a & b (2) c, d & e
(3) a,b,c & e (4) a,b,c,d & e

159. **Assertion** : DNA replication occurs within a small opening of DNA helix refered to as replication fork.
Reason : For long DNA molecules, two strands cannot be separated in its entire length, due to high energy requirement.
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

160. During glycolysis, a molecule that receives two redox equivalents is
(1) PGAL
(2) BPGA
(3) NAD^+
(4) PEP

161. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree



(1) autosomal recessive
(2) X-linked recessive
(3) X-linked dominant
(4) autosomal dominant

162. The activator for Rubisco enzyme is
(1) Mg ion
(2) Zn ion
(3) CO
(4) Ca ion

163. Keel is a characteristic feature of flower of
(1) *Calotropis*
(2) *Cassia*
(3) Bean
(4) Mustard

164. _____ was discovered as kinetin from the autoclaved herring sperm DNA
(1) cytokinin
(2) gibberellin
(3) auxin
(4) ABA

165. *Calotropis* in order to protect themselves from herbivores
(1) develop mealy coatings on leaves
(2) produces poisonous cardiac glycosides
(3) produces bitter fruits
(4) develop stiff hairs

166. The first biotic community that develops on rocks is
(1) lichens
(2) bryophytes
(3) shrubs
(4) phytoplanktons

167. A pure tall and a pure dwarf plant was crossed. Offsprings produced were self crossed. What is ratio between true breeding tall to true breeding dwarf?
(1) 3 : 1
(2) 1 : 1
(3) 2 : 1
(4) 1 : 2 : 1

168. **Statement-I** : The backbone of a polynucleotide chain is formed due to sugar and phosphates.

Statement-II : In RNA , every nucleotide residue has an additional -OH group present at 2'-position in the ribose sugar.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

169. Match the following

a.	t-RNA	i.	Transfer of genetic information
b.	m-RNA	ii.	Nucleolar organising region
c.	r-RNA	iii.	Linking of amino acids
d.	peptidyl transferase	iv.	Transfer of amino acids from cytoplasm to ribosome

(1) a-i, b-iv, c-iii, d-ii (2) a-iv, b-i, c-ii, d-iii
(3) a-iv, b-iii, c-ii, d-i (4) a-i, b-ii, c-iii, d-iv

170. A stamen and a pollen sac are respectively
(1) a microsporophyll and a microsporangium
(2) a microspore and a male gamete
(3) a microsporagium and microsporophyll
(4) a microsporophyll and a microspore

171. One of the environmental friendly manner to treat the e-waste is
(1) incineration
(2) burying in the ground
(3) recycling
(4) pyrolysis

172. What is true about a monocot leaf?
(1) Reticulate venation
(2) Absence of bulliform cells from epidermis
(3) Mesophyll not differentiated into palisade and spongy tissues
(4) Well differentiated mesophyll

173. Which of the following statement/s is/are not correct for Single Cell Protein (SCP)?
a. It provides a protein rich supplement
b. SCP has to be processed before use
c. Biomass is obtained from unicellular organisms only
d. It helps to minimise environmental pollution.
e. SCP can be produced by using bacteria and algae only
(1) b, c and e
(2) c, d and e
(3) c and e
(4) c only.

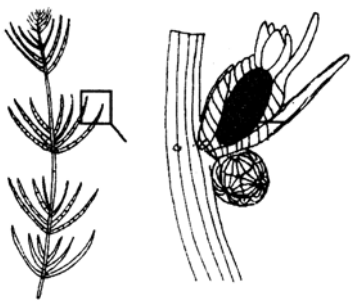
174. Read the following statements and choose the correct option
a. Phenotypic ratio of monohybrid F_2 progeny in case of dogflower/snapdragon is 3 : 1
b. 4 different genotypes and 6 different phenotypes are possible for human ABO blood types
c. Human genome contains 3164.7 million nucleotide bases
(1) a is correct but b and c are incorrect
(2) a and b are incorrect but c is correct
(3) b is correct but a and c are incorrect
(4) all are correct

175. Identify the incorrect statement
(1) The ribosome act as a catalyst for the formation of peptide bond
(2) The UTR's are present at both 5'-end (before start codon) and at 3'end (after stop codon)
(3) At the end of translation, a release factor binds to the stop codon
(4) When the larger subunit encounters an mRNA, the process of translation of the mRNA to protein begins

176. Which of the following is correct for imbibition?
(1) It is a special type of diffusion & absorption of water with formation of solution
(2) A water potential gradient must exist between imbibant and imbibate
(3) An absorbent can imbibe all types of liquid
(4) It has no role in seed germination

177. Which of the following is incorrect for non-cyclic photophosphorylation in higher plants?
(1) PS-I and PS-II both are involved
(2) $NADH_2$ is formed
(3) Occur in granal thylakoids
(4) Photolysis of water occurs

178. Bacterial which oxidise various inorganic substances are called as
(1) Chemoautotrophs
(2) Photoautotrophs
(3) Parasitic bacteria
(4) Decomposer

179.


The above diagram represents
(1) monoecious pteridophyte
(2) dioecious cryptogam
(3) monoecious bryophyte
(4) monoecious cryptogam

180. Asexual spore are conidia produced exogenously on special mycelium called conidiophore in
(1) Oomycetes
(2) Zygomycetes
(3) Ascomycetes
(4) Basidiomycetes

181. In a family, one parent is having blood group A and other blood group B. If all four blood group are represented among children, what is the genotype of parents?
(1) I^AI^A & I^Bi
(2) I^Ai & I^BI^B
(3) I^Ai & I^Bi
(4) I^AI^A & I^BI^B

182. Chipko movement was started in
(1) Tehri-Garhwal district of Uttaranchal
(2) Tehri-Garhwal district of M.P.
(3) Assam
(4) Kerala

183. **Statement-I** : Plant-animal interactions often involve co-evolution.

Statement-II :Evolution of flower and its pollinator species are tightly linked with one another.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

184. Choose the wrong statement
(1) Fungi constitute a unique kingdom of heterotrophic organisms
(2) White spot on mustard leaves are due to parasitic fungi
(3) Network of hyphae is known as mycelium
(4) All fungi are filamentous

185. How many statements are incorrect?
i. All animals belonging to various phyla are assigned to the kingdom Animalia.
ii. As we go higher from species to kingdom, number of common characters goes on increasing
iii. Different classes comprising fish, amphibians, reptiles, birds and mammals together constitute the phylum Chordata
iv. Plant order Polymoniales includes the families like Solanaceae and Convolvulaceae based on the vegetative and floral characters
(1) 1
(2) 2
(3) 3
(4) 4

BOTANY : SECTION-B

This section has 15 questions, attempt any 10 questions of them.

186. Sticky covering of pollen grains in entomophillous flower is secreted by
(1) epidermis
(2) middle layer
(3) tapetum
(4) endothecium

187. Manganse toxicity leads to deficiency of
(1) Iron
(2) Calcium
(3) Magnesium
(4) All of the above

188. Which of the following statement is incorrect w.r.t. kingdom protista?
(1) All single celled eukaryotes are placed under protista and the boundaries of this kingdom are well defined.
(2) Members of protista are primarily aquatic
(3) Protists reproduce asexually and sexually by a process involving cell fusion and zygote formation.
(4) Body organisation of protista is cellular

189. Match the organism with their unbearable condition & unable to migrate in column-I with their escaping in time process to avoid stress in column II.

Column I	**Column II**
a. Bears in winter	p. aestivation
b. Some snails & fishes to avoid summer related problems	q. diapause
c. Zooplankton species under unfavourable conditions	r. hibernation

(1) a-p, b-q, c-r
(2) a-r, b-p, c-q
(3) a-q, b-p, c-r
(4) a-p, b-r, c-q

190. Xylem of dicot stem is
(1) exarch
(2) endarch
(3) without xylem vessel
(4) centripetal

191. **Assertion** : The female gametophyte in angiosperms develop from single functional microspore.
Reason : The development of embryo sac in angiosperms is monosporic .
(1) Both Assertion and Reason are true and the reason is the correct explanation of the assertion
(2) Both Assertion and Reason are true but the reason is not the correct explanation of the assertion
(3) Assertion is true statement but Reason is false
(4) Assertion is false

192. Proton concentration increases in lumen of thylakoid during light reaction by
(1) splitting of water molecule
(2) reduction of CO_2
(3) oxidation of $NADP^+$ to NADPH and H^+
(4) movement of protons across coupling factor

193. Primary productivity depends on all, except
(1) variety of environmental factors
(2) availability of nutrients
(3) photosynthetic capacity of plants
(4) animal species inhabiting a particular area

194. Gel electrophoresis is used for
(1) cutting of DNA into fragments
(2) isolation of DNA molecule
(3) separation of DNA fragments according to their size
(4) the formation of recombinant DNA

195. Zoospores of green alga
(1) are non-motile
(2) have 2-8 equal flagella
(3) have unequal flagella
(4) have lateral flagella

196. All of the following are the problems that have come in the wake of the green revolution, except
(1) soil toxicity
(2) soil salinity
(3) water logging
(4) desertification

197. Which of the following diagram is the type of flower shown by Brinjal?

(1) 

(2) 

(3) 

(4) 

198. **Statement-I** : The life cycles of endoparasites are more complex as compared to ectoparasite because of their extreme specialisation.
Statement-II : Their morphological and anatomical features are greatly simplified while emphasising their reproductive potential.
(1) Both statement-I and statement-II are correct
(2) Both statement-I and statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct

199. In Prokaryotes
(1) Nucleosomes in chromatin are seen as 'beads-on-string' structure
(2) DNA in nucleoid is organised in large loops held by proteins
(3) Nucleosomes constitute the repeating unit of nucleoid
(4) Single stranded DNA is organised in large loops held by proteins

200. Leaf is
a. lateral in position
b. develop exogenously at node
c. non-green part
d. perform function of photosynthesis
e. originate from lateral meristem
(1) a,b & d
(2) a,b,d & e
(3) b & c
(4) a & c

Space for rough work

Space for rough work