GATIVE MARKING

SECTION-A

Attempt All 35 Questions

1. **If the kinetic energy of the particle is increased to 16 times, the percentage change in the de Broglie wavelength of the particle is :**

   (1) 25%

   (2) 75%

   (3) 60 %

   (4) 50 %

2. **Ratio of magnetic fields at the centre of a current carrying coil of radius R and at distance of 3R on its axis is :**

   (1) $10\sqrt{10}$

   (2) $20\sqrt{10}$

   (3) $2\sqrt{10}$

   (4) $\sqrt{10}$

3. **A dia-magnetic material in a magnetic field moves:**

   (1) Perpendicular to the field

   (2) From weaker to stronger parts

   (3) From stronger to weaker parts

   (4) In none of the above directions

4. **A stone is thrown at 25 m/s at 53° above the horizontal. At what time its velocity is at 45° below the horizontal :**

   (1) 0.5 s

   (2) 4 s

   (3) 3.5 s

   (4) 2.5 s

5. **The ratio of the distance covered to the displacement of a particle moved along a semi-circle of radius r is:**

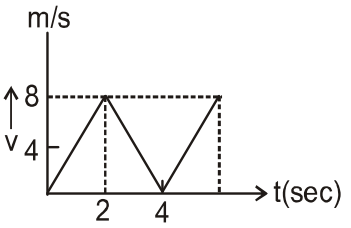
   (1) $\pi/4$

   (2) $\pi/2$

   (3) $3\pi/4$

   (4) π

6. The v-t graph for a particle is shown. The distance travelled in the first four seconds is :



(1) 12 m

(2) 16 m

(3) 20 m

(4) 24 m

7. A polarized light of intensity I_0 is passed through another polarizer whose pass axis makes an angle of 60° with the pass axis of the former. What is the intensity of emerging polarised light from second polarizer?

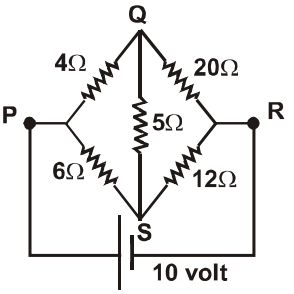
(1) $I = I_0$

(2) $I = \frac{I_0}{6}$

(3) $I = \frac{I_0}{5}$

(4) $\frac{I_0}{4}$

8. In shown circuit what should be the value of resistance that should be attached in parallel with 20 Ω so that no current flows through 5Ω resistance:



(1) $\frac{40}{3}\Omega$

(2) $\frac{80}{3}\Omega$

(3) $\frac{100}{3}\Omega$

(4) 8 Ω

9. In equation $\left(P+\frac{a}{V^2}\right)(V-b)=RT$. The quantity $\frac{a}{PVb}$ is dimensionally equal to :

(1) $M^1L^2T^{-2}$

(2) $M^0L^0T^0$

(3) $M^1L^0T^{-2}$

(4) $M^0L^1T^{-2}$

10. A particle of mass m moving with velocity v north wards, collides with another particle of mass m moving with velocity v east wards. After the collision the two particles coalesce. The velocity of the new particle is :

(1) $\sqrt{2}$ v north - east

(2) $\frac{v}{\sqrt{2}}$ north - east

(3) 2 v north east

(4) $\frac{v}{2}$ north - east

11. An electric field is applied to a semiconductor. Let the number of charge carriers be n and the average drift speed be v. If the temperature is increased-

(1) both n and v will increased

(2) n will increased but v will decreased

(3) v will increassed but n will decreased

(4) both n and v will decrease

12. An electric field E = $(20\hat{i}+25\hat{j})$ exist in space . If the potential at the origin is zero , then the potential at point (2 m , 4m) is :

(1) 130 volt

(2) –130 volt

(3) 140 volt

(4) –140 volt

13. The force between two short electric dipoles separated by a distance r varies as :

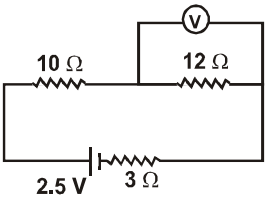
(1) r^{-4}

(2) r^{-2}

(3) r^2

(4) r^4

14. Find the reading of volt meter if it is ideal from shown circuit :



(1) 1.2 v

(2) 2.4 v

(3) 3.6 v

(4) 4.8 v

15. If $\vec{A} = 3\hat{i} + 4\hat{j} + 5\hat{k}$ and $\vec{B} = \hat{i} + \hat{j} + \hat{k}$

Match the column A and B

Column A	Column B
a. $\vec{A} \cdot \vec{B}$	p. $12/\sqrt{3}$
b. $\lvert \vec{A} \rvert$	q. 5
c. Component of $\vec{A}$ on $\vec{B}$	r. 12
d. Projection of A on x-y plane	s. $5\sqrt{2}$

(1) a-q, b-s, c-p, d-r

(2) a-r, b-s, c-p, d-q

(3) a-r, b-p, c-s, d-q

(4) a-r, b-q, c-p, d-s

16. Net potential may be zero on the line AB at point / points: (except at ∞)

(1) between A & B only

(2) Left of A only

(3) Right of B only

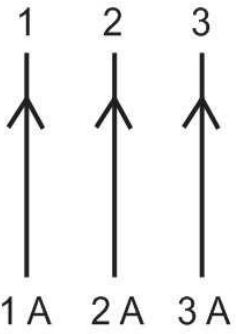
(4) Both (1) and (3)

17. Two springs of constants k_1 and k_2 have equal maximum velocities, when executing simple harmonic motion. The ratio of their amplitude (masses are equal) will be :

(1) $\frac{k_1}{k_2}$ (2) $\left(\frac{k_1}{k_2}\right)^{1/2}$

(3) $\frac{k_2}{k_1}$ (4) $\left(\frac{k_2}{k_1}\right)^{1/2}$

18. **Three wires are situated at the same distance. A current of 1A, 2A, 3A flows through these wires in the same direction. What is the ratio of F_1/F_2. Where F_1 is the net magnetic force on wire having current 1A and F_2 is the net magnetic force on wire having current 2A.**



(1) 7/8

(2) 1

(3) 9/8

(4) None of these

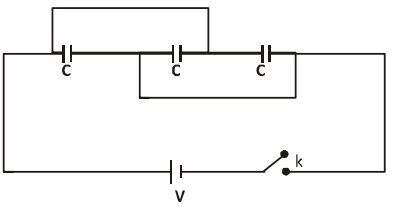
19. **The capacitors are uncharged in the begining . How much heat will be produced, when switch S is closed:**

(1) $\frac{1}{2}CV^2$

(2) CV^2

(3) $\frac{2}{3}CV^2$

(4) $\frac{3}{2}CV^2$



20. **A satellite revolve very near to the earth (radius R_e) then it's time - period is :**

(1) $\pi\sqrt{\frac{2R_e}{g}}$

(2) $2\pi\sqrt{\frac{2R_e}{g}}$

(3) $2\pi\sqrt{\frac{R_e}{g}}$

(4) $\frac{\pi}{2}\sqrt{\frac{R_e}{g}}$

21. The sinusoidal A.C. current flows through a register of resistance R. If the peak current is I_p. then power dissipated is:

(1) $I_p^2 R\cos\theta$ (2) $\frac{1}{2}I_p^2 R$

(3) $\frac{4}{\pi}I_p^2 R$ (4) $\frac{1}{\pi^2}I_p^2 R$

22. An object 5 cm tall is placed 1 m from a concave spherical mirror which has a radius of curvature of 20 cm. The size of the image is :

(1) 0.11 cm

(2) 0.50 cm

(3) 0.55 cm

(4) 0.60 m

23. The speed of a wave in a medium is 1500 m/s then number of waves pass through a point in 1 minute in this medium, if the wavelength of wave is 25 m:

(1) 3600

(2) 7200

(3) 1800

(4) 90000

24. 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} per m^3 atoms of Indium. Calculate the number of holes. Given that $n_i = 1.5 \times 10^{16}\ m^{-3}$. Is the material n-type or p-type:

(1) $3.54 \times 10^9\ m^{-3}$, n-type

(2) $2.54 \times 10^9\ m^{-6}$, p-type

(3) $4.54 \times 10^9\ m^{-6}$, p-type

(4) $4.54 \times 10^9\ m^{-3}$, n-type.

25. Two liquids are at temperature 20°C and 40°C. When same mass of both of them is mixed, the temperature of the mixture is 32°C. What is the ratio of their specific heats :

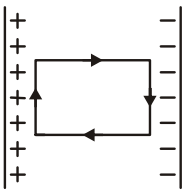
(1) 1/3

(2) 2/5

(3) 3/2

(4) 2/3.

26. **The intensity of an electric field inside a capacitor is E. The work required to make a charge q, move in a closed rectangular circuit is :**



(1) 2 (*l* + b) qE

(2) 2*l*qE

(3) 2bqE

(4) Zero.

27. **In an electromagnetic wave in free space the root mean square value of the electric field is $E_{rms} = 6\,V/m$. The peak value of the magnetic field is:**

(1) $2.83\times10^{-8}\,T$

(2) $0.70\times10^{-8}\,T$

(3) $4.23\times10^{-8}\,T$

(4) $1.41\times10^{-8}\,T$

28. **An electric dipole of moment p is placed in the position of stable equilibrium in uniform electric field of intensity E. This is rotated through an angle θ from the initial position. The potential energy of the electric dipole in the final position is :**

(1) $-pE\cos\theta$

(2) $pE(1-\cos\theta)$

(3) $pE\cos\theta$

(4) $pE\sin\theta$.

29. **A proton carrying 1 MeV kinetic energy is moving in a circular path of radius R in uniform magnetic field. What should be the energy of an α-particle to describe a circle of same radius in the same field :**

(1) 2MeV

(2) 1 MeV

(3) 0.5 MeV

(4) 4 MeV.

30. **A coil of inductive reactance $1/\sqrt{3}\,\Omega$ and resistance 1Ω is connected to a 200V, 50 Hz AC supply. The time lag between maximum voltage and current is :**

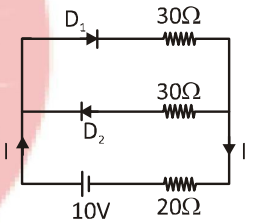
(1) $\frac{1}{200}$S

(2) $\frac{1}{300}$S

(3) $\frac{1}{500}$S

(4) $\frac{1}{600}$S

31. **In the circuit, the forward resistance of each diode is 50Ω and the reverse resistance of each diode is infinite. Find the current through 20 ohm resistor :**



(1) 0.2A (2) 0.4A

(3) 0.3 A (4) 0.1 A.

32. **A mercury drop of radius 1 cm is sprayed into 10^6 droplets of equal size. Calculate the energy expanded if surface tension of mercury is 35×10^{-3} N/m :**

(1) 0.156×10^{-3} J

(2) 3.356×10^{-3} J

(3) 4.356×10^{-3} J

(4) 3.560×10^{-3} J.

33. **Two open pipes A and B are sounded together such that 2 beats are heard. Now A is closed beat frequency is still 2. What is the ratio of length's of pipe :**

(1) 1 : 1

(2) 3 : 4

(3) 4 : 1

(4) 2 : 1

34. **Sodium and copper have work function 2.3 eV and 4.5 eV respectively then the ratio of their threshold wavelengths is nearest to:**

(1) 1 : 2 (2) 4 : 1

(3) 2 : 1 (4) 1 : 4

35. **A body moves in a circular path of radius r = 500 m with tangential acceleration $a_1 = 2$ m/s^2. When its tangential linear velocity is 30 m/s, the total acceleration will be :**

(1) 5.4 m/s^{-2}

(2) 3.9 ms^{-2}

(3) 2.7 ms^{-2}

(4) 2.1 ms^{-2}.

SECTION - B

This section will have 15 questions. Candidate can choose to attempt any 10 questions out of these 15 questions. In case if candidate attempts more than 10 questions, first 10 attempted questions will be considered for marking.

36. **A slit of width 'd' is illuminated by light of wavelength 5000 Å. For what value of 'd' will the first maximum fall at an angle of diffraction of 30°:**

(1) 1.0×10^{-6} m

(2) 1.5×10^{-6} m

(3) 2.5×10^{-6} m

(4) 3.0×10^{-5} m

37. **The minimum angle of deviation is 30° by a hollow prism filled with liquid. Ray of light refracted at an angle 30° . The refractive index of liquid is :**

(1) $\sqrt{3}$

(2) $\sqrt{2}$

(3) 1/2

(4) $\sqrt{3}/2$

38. **A 5.5m long string has a mass of 0.035 kg. If the tension in the string is 77N, then the speed of a transverse wave on the string is :**

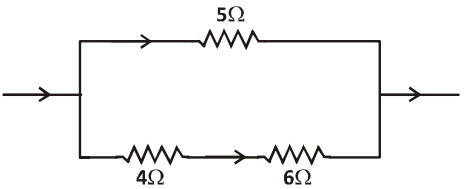
(1) 770 m/sec.

(2) 120 m/sec.

(3) 175 m/sec.

(4) 110 m/sec.

39. In the circuit shown, the heat generated in the 5Ω resistor due to current flowing through it is 10 cal/sec. The heat generated in the 4Ω resistor is :



(1) 8 cal/sec (2) 10 cal/sec

(3) 2 cal/sec (4) 12 cal/sec

40. The equation of SHM is $y = a\sin(2\pi nt + \alpha)$. then its phase at time t is:

(1) α

(2) $2\pi nt$

(3) $2\pi nt + \alpha$

(4) $2\pi t$

41. The driver of a three-wheeler moving with a speed of 36 km/h sees a child standing in the middle of the road and brings his vehicle to rest in 4.0 s just in time to save the child. What is the average retarding force on the vehicle ? The mass of the three-wheeler is 400 kg and the mass of the driver is 65 kg:

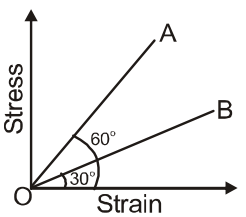
(1) 1.2×10^4 N

(2) 1.2×10^3 N

(3) 1.3×10^2 N

(4) 1.2×10^5 N

42. The stress versus strain graphs for wires of two materials A and B are as shown in the figure. If Y_A and Y_B are the Young's modulii of the materials, then :



(1) $Y_B = 2Y_A$

(2) $Y_A = Y_B$

(3) $Y_B = 3Y_A$

(4) $Y_A = 3Y_B$.

43. **A spherical ball of radius 3.0×10^{-4} m and density 10^4 kg/m^3 falls freely under gravity through a distance h before entering a tank of water. If after entering the water the velocity of the ball does not change, final h will be. Viscosity of water is 9.8×10^{-6} N-s/m^2 :**

(1) 1.65×10^3 m (2) 3.30×10^3 m

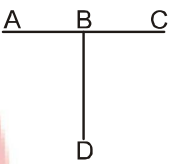
(3) 2.65×10^3 m (4) 4.65×10^3 m.

44. **The density of air at pressure of $10^5 N/m^2$ is 1.2 kg/m^3 under these conditions the V_{rms} of the air molecules in m/s is:**

(1) 500 (2) 1000

(3) 1500 (4) 3000

45. **Three conducting rods of same material and cross-section are shown in figure. Temperature of A, D and C are maintained at 20°C, 90°C and 0°C. The ratio of lengths of BD and BC if there is no heat flow in AB is:**



(1) $\frac{2}{7}$ (2) $\frac{7}{2}$

(3) $\frac{9}{2}$ (4) $\frac{2}{9}$

46. **Given below are two statements :**

Assertion I:

The Bohr model is applicable to hydrogenic atoms. It cannot be extended to even two electron atoms such as helium

Reason II :

The formulation of Bohr model involves electrical force between positively charged nucleus and electron. It does not include the electrical forces between electrons which necessarily appear in multi-electron atoms.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both assertion and reason are true and reason is the correct explanation of the assertion

(2) Both assertion and reason are true and reason is not the correct explanation of the assertion

(3) Assertion is false and reason is true

(4) Both assertion and reason false.

47. Given below are two statements :

Statement I:

The nuclear force does not distinguish between neutron and proton.

Statement II :

Energy associated with nuclear processes are about a million times larger than chemical process.

In the light of the above statements, choose the most appropriate answer from the options given below :

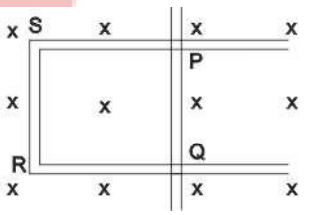
(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

48. Figure shows a rectangular conductor PQRS in which conductor PQ is free to move assume there is no friction and Magnetic field is uniform inward the plane of paper resistance of:



Statement I:

If rod PQ is projected towards right with speed v = v_0 at t = t_0 it will move with uniform speed afterwards.

Statement II :

There will be a constant current in Loop PQRS.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

49. Given below are two statements :

Statement I:

For an ideal gaseous system work is done by the gas in an adiabatic process if gas is cooled.

Statement II :

The heat absorbed by the gas goes entirely to change its internal energy and its temperature.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

50. The distance between two rails is 1.2 m. The centre of gravity of the train is at a height of 2 m from the ground. The maximum safe speed of the train on the circular path of radius 150 m is :

(1) 21 ms^{-1}

(2) 42 ms^{-1}

(3) 63 ms^{-1}

(4) 84 ms^{-1}

O=16, Na=23, Mg=24, P=31, S=32, Cl=35.5,
g=108, I=127, Ba=137, Au=197, Pb=207

SECTION-A

Attempt All 35 Questions

51. The ionization energy is maximum for :

(1) Na

(2) S

(3) F

(4) Mg

52. Consider the order $N^{-3} > O^{2-} > F^{-} > Na^{+}$ the correct statement is :

(1) increasing order of Zeff.

(2) increasing order of I.E.

(3) decreasing order of size

(4) increasing order of electron affinity

53. In case of sp^3d hybridisation, if ratio of longer and shorter σ-bonds is 1 : 1 then how many lone pair's must be present:

(1) Zero

(2) One

(3) Two

(4) Three

54. Given below are two statements :

Statement I:

In B_2H_6 four terminal B-H bonds are three centre two electron bonds.

Statement II :

In B_2H_6 four terminal Hydrogen atoms and the two Boron atoms lie in one plane.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

55. What volume of oxygen gas (O_2) measured at 0^0C and 1 atm, is needed to burn completely 2 L of propane gas (C_3H_8) measured under the same conditions :

(1) 6 L

(2) 5 L

(3) 10 L

(4) 7 L

56. $CH_3 - CH_2 - Cl \xrightarrow{\text{Ethanolic NaCN}} A$

A is :

(1) $CH_3–CH_2–CN$

(2) $CH_3–CH_2–CH_3$

(3) $CH_3–CH_2–CH_2–NH_2$

(4) None of these

57. Which of the following is least reactive towards addition of HBr :

(1) Propene

(2) 2-Methyl butane

(3) But-2-ene

(4) Benzene

58. A solution is prepared by adding 2 gm of a substance A to 18 gm of water. The mass percent of the solute is :

(1) 5%

(2) 25%

(3) 10%

(4) 20%

59. In milk sugar linkage between :

(1) C_1 of glucose and C_4 of galactose

(2) C_1 of glucose and C_2 of galactose

(3) C_1 of galactose and C_2 of glucose

(4) C_1 of galactose and C_4 of glucose

60. The solubility of AgCl in 2 M NaCl is

[K_{sp} AgCl = 1.8 ×10^{-10}]

(1) 1.8×10^{-11} M (2) 9.0×10^{-11} M

(3) 6.5×10^{-12} M (4) 6×10^{-11} M

61. Given below are two statements :

Statement I:

Lesser the lattice enthalpy more stable will be ionic compound.

Statement II :

The lattice enthalpy is greater for ions of highest charge and smaller radii.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

62. The highest number of hydrogen molecules are present in :

(1) 2 u of hydrogen

(2) 2 g of hydrogen

(3) 11.2 lit at H_2 at STP

(4) 2 mole of hydrogen

63. The d-orbital involved in the hybridisation of SF_6 :

(1) $d_{x^2-y^2}$

(2) d_{xy}

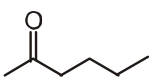
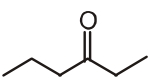
(3) d_{z^2}

(4) $d_{x^2-y^2}$ and d_{z^2}

64. In a reversible isothermal process, the change in internal energy is :

(1) positive (2) negative

(3) Zero (4) May be –ve or +ve

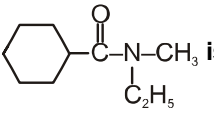
65.  **and**  **are :**

(1) Position Isomers

(2) Chain isomers

(3) Metamers

(4) Both (1) and (3)

66. **IUPAC name of the compound**  **is :**

(1) N-ethyl-N-methyl cyclohexanecarboxamide

(2) N-ethyl-N-methyl cyclopentanecarboxamide

(3) N-ethyl-N-methyl cyclohexanamide

(4) None of these

67. **Select the anion which is the weakest conjugate base:**

(1) ClO_4^-

(2) ClO_3^-

(3) ClO_2^-

(4) ClO^-

68. **The boiling point of benzene is 353.23 K. When 1.80 g of a non-volatile solute was dissolved in 90 g of benzene, the boiling point is raised to 354.11 K. Calculate the approx molar mass of the solute. K_b for benzene is 2.53 K kg mol^{-1} :**

(1) 58 g mol^{-1}

(2) 65 g mol^{-1}

(3) 50 g mol^{-1}

(4) 78 g mol^{-1}

69. **If combustion of 4 g of CH_4 liberates 2.5 kcal of heat, then heat of combustion of CH_4 will be :**

(1) –30 kcal

(2) –10 kcal

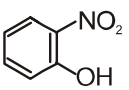
(3) 2.5 kcal

(4) –5 kcal

70. **Intermolecular hydrogen bonding is present in :**

(1) Liquid HF

(2) H_2O_2

(3) 

(4) Both 1 and 2

71. Which reaction is not a redox reaction :

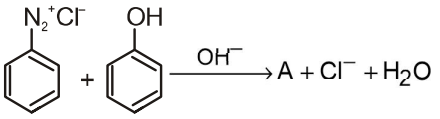
(1) $ZnO + NaOH(aq) \rightarrow Na_2ZnO_2 + H_2O$

(2) $CaCl_2 + Na_2CO_3 \rightarrow CaCO_3 + 2NaCl$

(3) $ICl_3 + 2H_2O \rightarrow HIO_2 + 3HCl$

(4) All of these

72.



A is :

(1) p-Hydroxybenzene

(2) p-Hydroxyazobenzene

(3) p-Aminoazobenzene

(4) None of these

73. Select the incorrect statement :

a. The common oxidation states exhibited by group 14 elements are +4 and +3.

b. Carbon and Silicon mostly show +4 oxidation state.

c. Group 14 oxides in higher oxidation states of elements are generally less acidic than those in lower oxidation state.

(1) a, b and c

(2) a and b

(3) b and c

(4) a and c

74. Match the List-I with List-II :

	List-I		**List-II**
A.	**NH_4^+**	**I.**	**Folded square**
B.	**BrF_3**	**II.**	**Linear**
C.	**XeF_2**	**III.**	**Tetrahedral**
D.	**SF_4**	**IV.**	**Bent T-shaped**

Choose the correct answer from the option given below :

(1) A-III B-II, C-IV, D-I

(2) A-III, B-IV, C-I, D-II

(3) A-III, B-IV, C-II, D-I

(4) A-I, B-IV, C-III, D-II

75. **The correct expression of K_p for the equilibrium $XY \rightleftharpoons X+Y$ is :**

(1) $K_P = \frac{\alpha^2}{1+\alpha^2} \times P$

(2) $K_P = \frac{\alpha^2}{1-\alpha^2} \times P^2$

(3) $K_P = \frac{\alpha^3}{1-\alpha^2} \times P$

(4) None

76. **What is the mole fraction of the solute in a 2.00 m aqueous solution :**

(1) 1.770

(2) 0.067

(3) 0.035

(4) 0.177

77. **In which of the following equilibria $K_p > K_c$:**

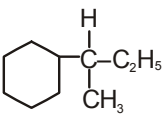
(1) $H_2 + I_2 \rightleftharpoons 2HI$

(2) $PCl_{5(g)} \rightleftharpoons PCl_{3(g)} + Cl_{3(g)}$

(3) $H_{2(g)} + O_{2(g)} \rightleftharpoons 2H_2O_{(g)}$

(4) $CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_{2(g)}$

78. **IUPAC name of compound is :**



(1) 3-cyclohexylbutane

(2) 2-Phenylbutane

(3) 2-cyclohexylbutane

(4) 3-Phenylbutane

79. **For the system of gases A, B, C and D at equilibrium $A + 2B \rightleftharpoons C + 3D$, the partial pressure find to be A = 0.2 atm, B = 0.4 atm, C = 0.6 atm and D = 0.8 atm, what is the numerical value of the equilibrium constant K_p:**

(1) 18.75

(2) 11.25

(3) 9.6

(4) 2.7

80. **A body of mass 10 mg is moving with a velocity of 100 m s^{-1}. The wavelength of the de-Broglie wave associated with it would be :**

(1) 6.63×10^{-7} m

(2) 6.63×10^{-30} m

(3) 6.63×10^{-4} m

(4) 6.63×10^{-31} m

81. **Which is correct order of their pK_b value for the given compounds :**

i. CH_3^- **ii.** OH^-

iii. CH_3COO^- **iv.** NH_2^-

(1) ii > iii > iv > i

(2) iii > ii > iv > i

(3) iv > iii > ii > i

(4) iii > iv > i > ii

82. **Represent the cell in which the following reaction takes place**

$Mg(s) + 2Ag^+(0.0001M) \rightarrow Mg^{2+}(0.130M) + 2Ag(s)$

Calculate its $E_{(cell)}$ if $E^\circ_{(cell)}$ = 3.17 V.

(1) 6.29 V

(2) 9.69 V

(3) 1.96 V

(4) 2.96 V

83. **Assuming the atomic weight of a metal M to be 56, find the molecular formula of its oxide containing 84 % of M.**

(1) M_3O_2

(2) M_2O_3

(3) MO

(4) None of these

84. **Given below are two statements :**

Statement-I : Both $[Fe(H_2O)_5NO]^{+2}$ and $[Cr(H_2O)_6]^{+3}$ complexes are octahedral and having similar magnetic behaviour.

Statement-II : Given both the complexes are paramagnetic.

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

85. The mass of CaO that shall be obtained by heating 25 kg of 60% pure lime stone is:

(1) 8.4×10^3 gm

(2) 1.80×10^3 gm

(3) 8.4×10^{-3} gm

(4) 8.96×10^3 gm

SECTION-B

This section will have 15 questions. Candidate can choose to attempt any 10 questions out of these 15 questions. In case if candidate attempts more than 10 questions, first 10 attempted questions will be considered for marking.

86. Given below are two statements :

Statement I:

The enthalpy change for a reaction does not depend upon the number of intermediate reaction steps.

Statement II :

The enthalpy change for a reaction does not depend upon the difference in initial or final temperatures of involved substances.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

87. Spin only magnetic moment is maximum for which of the following ion :

(1) Ti^{+3}

(2) Cr^{+2}

(3) Mn^{+2}

(4) Fe^{+2}

88. Correct order of resonance energy for :

a. thiophene

b. Pyrrole

c. Furan

(1) c > b > a

(2) b > c > a

(3) b > a > c

(4) a > b > c

89. Match List-I with List-II

List-I (Complex)	List-II (Type of isomerism)
A. $[Co(NH_3)_6][Cr(CN)_6]$	i. Hydrated isomerism
B. $[Co(en)_2Cl_2]^+$	ii. Ionisation isomerism
C. $[Cr(H_2O)_4Cl_2]Br$	iii. Coordination isomerism
D. $[Co(H_2O)_6]Cl_3$	iv. Geometrical isomerism

(1) A-ii, B-i, C-iv, D-iii

(2) A-iii, B-iv, C-ii, iv, D-i

(3) A-iii, B-ii, C-ii, D-i

(4) A-iii, B-ii, iv, C-ii, iv, D-i

90. The molecules that will have zero dipole moment is/ are :

(1) trans-2-pentene

(2) cis-3-hexene

(3) trans-3-hexene

(4) both 1 and 2

91. Match List-I with List-II

List-I Species	List-II Reason of colour
A. MnO_4^-	i. Charge transfer
B. MnO_4^{-2}	ii. d, d transition
C. CrO_7^{-2}	iii. Nither charge transfer NOR d, d transition.
D. $Cr_2(SO_4)_3$	

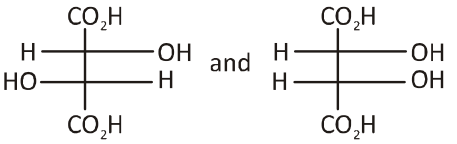
(1) A-ii, B-i, C-ii, D-iii

(2) A-i, B-ii, C-i, D-ii

(3) A-ii, B-iii, C-i, D-ii

(4) A-iii, B-i, C-i, D-ii

92. The two isomers given below :



(1) Enantiomers (2) Diastereomers

(3) Mesomers (4) Positional isomers

93. Calculate the overall order of a reaction which has the rate expression

(a) Rate = k $[A]^{1/2}$ $[B]^{3/2}$

(b) Rate = k $[A]^{3/2}$ $[B]^{-1}$

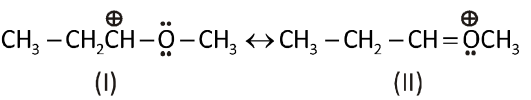
(1) a-Zero order, b-Second order

(2) a-Second order, b-Half order

(3) a-First order, b-Zero order

(4) a-Half order, b-Second order

94. Which of the following resonance structure is the major contributor of the resonnance hybrid



(I) (II)

(1) I

(2) II

(3) Both have equal contribution

(4) they are not resonance structure

95. The pair of metal ions which are diamagnetic :

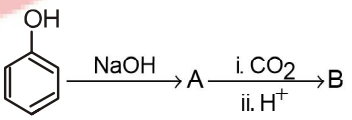
(1) Sc^{+3}, Cu^{+2}

(2) Sc^{+3}, Zn^{+2}

(3) Zn^{+2}, Cu^{+2}

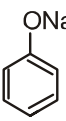
(4) Sc^{+3}, Ti^{+3}

96.

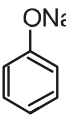


B is :

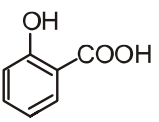
(1)



(2)



(3)



(4) None of these

97. In the reaction

$$CH \equiv CH \xrightarrow[H_2SO_4]{HgSO_4} X \xrightarrow{LiAlH_4} Y \xrightarrow[NaOH]{Br_2} Z,$$

Z is :

(1) Ethylidene bromide

(2) Bromoform

(3) Ethylene dibromide

(4) Ethanoyl bromide

98. Given below are two statements :

Statement I:

Aldehyde and ketones are generally prepared by oxidation of primary and secondary alcohol respectively.

Statement II :

Treating a nitrile with grignard reagent followed by hydrolysis yields an alcohol.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct.

99. Which of the following has the lowest nucleophilicity :

(1) F^- (2) OH^-

(3) CH_3^- (4) NH_2^-

100. Match List-I with List-II

	List-I (Compound)		**List-II (Reagent)**
A.	**Alcohol**	**i.**	**Lucas test**
B.	**Aldehyde**	**ii.**	**DNP**
C.	**Alkenes**	**iii.**	**Bayer's test**
D.	**1⁰ Amine**	**iv.**	**Carbylamine test**

and select the correct option from given options.

(1) A-i, B-ii, C-iii, D-iv (2) A-iv, B-ii, C-iii, D-i

(3) A-ii, B-i, C-iii, D-iv (4) A-iii, B-i, C-ii, D-iv

PART-1 (SECTION-A)

Attempt All 35 Questions

101. Study the four statements (i-iv) given below and select the two correct ones out of them.

(i) A lion eating a deer and a sparrow feeding on grains are ecologically similar in being consumers .

(ii) Predator star fish *Pisaster* help in maintaining species diversity of some invertebrates.

(iii) Predators ultimately lead to the extinction of prey species.

(iv) Production of chemicals such as nicotine, strychnine by the plants are metabolic disorders.

The two correct statements are :

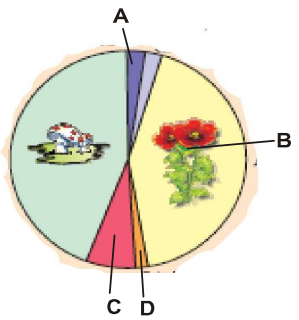
(1) (ii) and (iii)

(2) (iii) and (iv)

(3) (i) and (iv)

(4) (i) and (ii).

102. In the diagram given below identify A, B, C, D :



(1) B – Angiosperm

(2) A –Mosses

(3) C – Algae

(4) All

103. Which one of the following are maximum number of species in Amazonian Rain forest

(1) Plants

(2) Amphibians

(3) Invertebrates

(4) Fishes

104. How many MTP are performed in a year all over the world :

(1) 4.5 to 5 million

(2) 450 to 500 million

(3) 4 to 5 million

(4) 45 to 50 million

105. In *E. coli*, during lactose metabolism, in absence of inducer, repressor protein binds to :

(1) Regulator gene

(2) Operator

(3) Structural gene

(4) Promoter

106. If a sample of B-DNA containes 100000 Nucleosome then what is the length of B-DNA sample :

(1) 0.68 mm

(2) 6.8 mm

(3) 0.68 cm

(4) Both 2 and 3

107. Transgenic animals may be useful for

(1) Study of normal physiology and development

(2) Study of disease

(3) Producing biological products

(4) All of the above

108. Given below are two statements

Statement I:

Some plasmids may have only one or two copies per cell whereas others may have 15–100 copies per cell.

Statement II :

Plasmids and Bacteriophage have the ability to replicate within bacterial cells independent of the control of chromosomal DNA.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

109. Which of the following statement is true During photosynthesis

(1) Several factors interact and simultaneously affect photosynthesis

(2) Usually one factor is the major cause and limit the rate

(3) At any point the rate will be determined by the factor available at sub optimal levels

(4) All of these are true

110. Given below are two statements

Statement I:

Closely located genes assorted together and distantly located genes, due to recombination assorted independently.

Statement II :

Many genes were linked to sexes also and called sex-linked genes.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

111. Assertion (A) : The Human Heart are myogenic type

Reason (R): In Human Heart intercalated disc are present

(1) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(2) (A) is true but (R) is false

(3) (A) is false but (R) is true

(4) Both (A) and (R) are true and (R) is the correct explanation of (A)

112. Which is the connecting link between glycolysis and Kreb's cycle :

(1) Iso-citric acid

(2) α-ketoglutaric acid

(3) Glucose

(4) Acetyl Co-A

113. In tissue pO_2 and pCO_2 are respectively :

(1) 45 mmHg and 40 mmHg

(2) 40 mmHg and 45 mmHg

(3) 40 mmHg and 40 mmHg

(4) 45 mmHg and 45 mmHg

114. If the sequence of m-RNA is

AUGUUUCUUAUUAUAUCU

Then what is the sequence of amino acid in polypeptide chain :

(1) Met-Phe-Leu-Ile-Ile-Ser

(2) Met-Leu-Phe-Ile-Ile-Ser

(3) Met-Leu-Ile-Phe-Ile-Ser

(4) Met-Phe-Leu-Ile-Ser-Ile

115. Recombination is completed in which phase of meiosis:

(1) Leptotene

(2) Zygotene

(3) Pachytene

(4) Diakinesis

116. Select the correct option, which represents the homopolysaccharides made up of glucose monomers:

(1) Sucrose, lactose, maltose

(2) Chitin, glycogen, starch

(3) Starch, inulin, peptidoglycan

(4) Starch, glycogen, cellulose

117. Given below are two statements

Statement I:

The reserve material in prokaryotic cell are stored in the cytoplasm in the form of inclusion bodies.

Statement II :

Besides flagella, pili and fimbriae are also surface structures of the bacteria but do not play a role in motility.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

118. Given below are two statements

Statement I:

Adult Human haemoglobin consist of 8 sub units.

Statement II :

The enzymes isolated from organisms who normally live under extremely high temperatures (e.g. hot vents and sulphur springs), are stable and retain their catalytic power at high temperatures (up to 80^0–90^0C).

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

119. Given below are two statements

Statement I:

JGA is a special sensitive region formed by cellular modifications in the distal convoluted tubule and the afferent arteriole at the location of their contact.

Statement II :

Tubular secretion is also an important step in urine formation as it help in the maintenance of ionic and acid base balance of body fluids.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

120. Select the incorrect statement for Abscisic acid

(1) It acts as a general plant growth inhibitor and an inhibitor of plant metabolism

(2) ABA inhibits seed germination

(3) ABA helps seeds to withstand desiccation and other factors unfavourable for growth

(4) In most situation, ABA act as an antagonist to ethylene

121. Given below are two statements , one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A):

In Neem the leaf is pinnately compound type.

Reason (R) :

In leaf of Neem the incisions of the lamina reach up to the midrib breaking it into a number of leaflets.

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

122. In frog in which part of alimentary canal microvilli are present

(1) stomach
(2) pharynx
(3) intestine
(4) none of these

123. Select the correct statement for the root hair

(a) Root hair absorb water and minerals from the soil
(b) Present in region of maturation of the root
(c) It is very fine and delicate, thread - like structure
(d) Epidermal cells form the root hair

(1) All
(2) Only a, b, c
(3) Only b, c, d
(4) Only c, d

124. What is ganglia

(1) Other name of neuron
(2) Group of neuron
(3) Group of nissl's granules
(4) Other name of synaptic knob

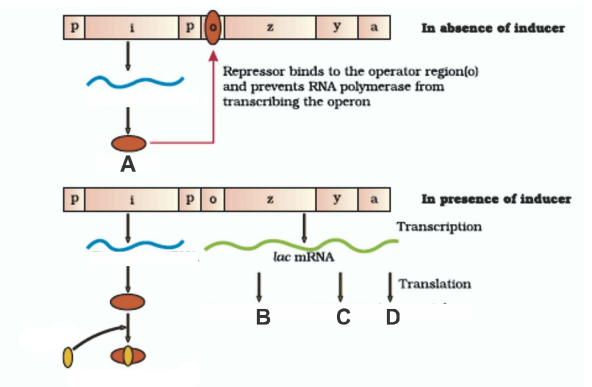
125. Which one of the following is the incorrect match

(1) Cranial bone – Axial skeleton
(2) Facial bone – Axial skeleton
(3) Sternum – Axial skeleton
(4) None of these

126. The correct sequence of electron acceptor in ATP synthesis is :

(1) Cyt, b, c, a_3, a
(2) Cyt, c, b, a, a_3
(3) Cyt. a, a, b, c
(4) Cyt. b, c_1, c, a, a_3

127. Select the correct option for the given diagram



(1) A–Inducer (2) B–Permease

(3) C–β-galactosidase (4) D–Transacetylase

128. Conversion of humus into inorganic nutrients is called:

(1) Catabolism
(2) Leaching
(3) Mineralisation
(4) Fragmentation.

129. Intestinal perforation may occur in severe cases of

(1) Ringworm
(2) Malaria
(3) Typhoid
(4) Both 1 and 3

130. In agarose gel electrophoresis the DNA fragment which moves farthest from loading place

(1) Largest
(2) smallest
(3) no information for size can be given
(4) medium size

131. The process of translation is

(1) Ribosome synthesis
(2) Protein synthesis
(3) DNA synthesis
(4) RNA synthesis

132. All of the following are part of an operon except

(1) An operator
(2) Structural genes
(3) An enhancer
(4) A promoter

133. Which one of the following is the correct match with reference to biodiversity:

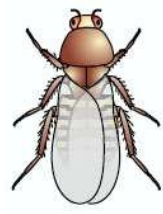
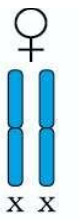
(1) Fishes – 28,000 species
(2) Beetles – 30,000 species
(3) Orchids – 50,000 species
(4) Ants – 12,000 species

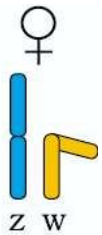
134. Which one of the following is the incorrect match:

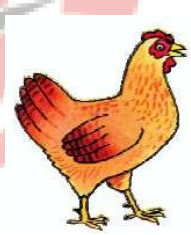
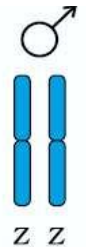
(1) DNA – Hydrophilic molecule
(2) Tumor Preventing Plasmid – *Agrobacterium*
(3) Retrovirus – Vector
(4) Insertional Inactivations – β – galactosidase

135. In the diagram given below how many are correct match

a.  – 

b.  – 

c.  – 

d.  – 

(1) Three
(2) Four
(3) Two
(4) One

PART-1 (SECTION-B)

This section will have 15 questions. Candidate can choose to attempt any 10 question out of these 15 question. In case if candiate attempts more than 10 question, first 10 attempted question will be considered for marking.

136. Statement -I- In gymnosperm the roots are generally adventitious roots.
Statement-II- Gymnosperm include medium sized trees or tall trees and shrubs.
(1) Both Statement I and Statement II are incorrect
(2) Statement I is correct but Statement II is incorrect
(3) Statement I is incorrect but Statement II is correct
(4) Both Statement I and Statement II are correct

137. How many matching are correct

a.	**Aneuploidy**	**–**	**Down syndrome**
b.	**Polyploidy**	**–**	**Haemophilia**
c.	**Polyploidy**	**–**	**Colour blindness**
d.	**Clotting of blood affected**	**–**	**Haemophilia**

(1) Three (2) Two

(3) Four (4) One

138. Select the incorrect match

(1)	Tap root	–	Wheat
(2)	Tap root	–	Mustard
(3)	Adventitious root	–	Monstera
(4)	Adventitious root	–	Grass

139. Which one of the following are incorrect with reference to antagonistic hormone

(1)	PTH	–	TCT
(2)	Insulin	–	Glucagon
(3)	Renin-Angiotensin mechanism	–	ANF
(4)	None of these		

140. Which of the following are the incorrect match

(1)	Explants	–	Tissue culture
(2)	Micro-propagation	–	Tissue culture
(3)	Somaclones	–	Tissue culture
(4)	GMO	–	Only Bacteria and Fungi

141. Which one of the following are the incorrect match for population growth

(1)	$\frac{dN}{dt} = rN$	–	Exponential growth
(2)	$N_t = N_0 e^{rt}$	–	Exponential growth
(3)	$\frac{dN}{dt} = rN\left(\frac{k-N}{k}\right)$	–	Logistic growth
(4)	b + d	–	Intrinsic rate of Natural increase

142. Which one of the following are the incorrect full form

(1)	GFC	–	Grazing food chain
(2)	DFC	–	Detritus food chain
(3)	PAR	–	Photosynthetically active radiation
(4)	GPP	–	Grazing percentage productivity

143. How many matching are correct

(a) CNS – Spinal cord
(b) PNS – Somatic Neural System
(c) PNS – Visceral Nervous System
(d) Multipolar neuron – Cerebral cortex

(1) Three (2) Four
(3) One (4) Two

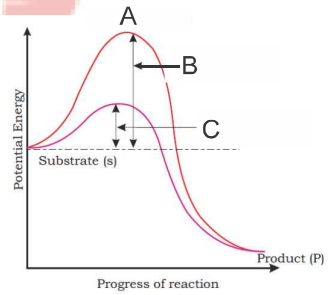
144. Which one of the following is not included in the hind limb bone :

(1) Tarsals
(2) Metatarsals
(3) Femur
(4) Ulna

145. Select the incorrect match

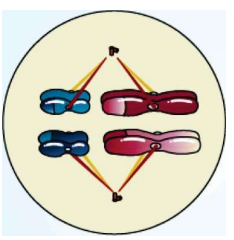
(1) C_4 plant – Sorghum
(2) C_4 plant – RuBiSCO
(3) RuBP – 7 carbon containing compound
(4) PEP, PGA – 3 carbon containing compound

146. Select the correct option for the given diagram



(1) A–Transition state
(2) B–Activation energy without enzyme
(3) C–Activation energy with enzyme
(4) All

147. Select the correct option for the given diagram



(1) Prophase I (2) Metaphase I
(3) Metaphase II (4) Anaphase I

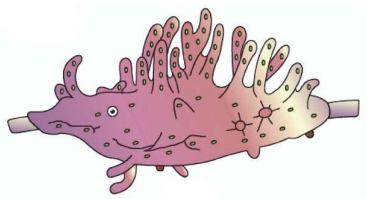
148. Select the correct match

(1) Synaptonemal complex – Prophase II
(2) Crossing over – Prophase II
(3) Separation of homologous chromosome – Anaphase I
(4) Recombination Nodules – Anaphase I

149. A comparison of the volume of the filtrate formed per day (180 litres per day) with that of the urine released (1.5 litres), suggest that nearly 99 percent of the filtrate has to be reabsorbed by the renal tubules this process is called

(1) Glomerular filtration (2) Imbibition
(3) Reabsorption (4) Sedimentation

150. The diagram given below is of



(1) Fresh water sponge → Sycon
(2) Fresh water sponge → Spongilla
(3) Fresh water sponge → Euspongia
(4) Marine sponge → Spongilla

PART-2 (SECTION-A)

Attempt All 35 Questions

151. The given floral formula related to which family :

$$\% \, ♀♂ \, K_{(5)} \, C_{1+2+(2)} \, A_{(9)+1} \, \underline{G}_{1}$$

(1) Brassicaceae (2) Solanaceae
(3) Liliaceae (4) Fabaceae

152. Which scientist had said that evolution of life forms had occured but driven by use and disuse of organs

(1) Lamarck
(2) Hugo de vries
(3) S.L. miller
(4) A.I. oparin

153. 8-16 cell stage of embryo is called

(1) blastocyst
(2) morula
(3) trophoblast
(4) none of these

154. What will be the number of the chromosomes in human in S-phase if the number of chromosomes in G_2-phase is 46 :

(1) 44 (2) 23

(3) 46 (4) 92

155. Match the following

a. Lycopsida	**(i) *Adiantum***
b. Pteropsida	**(ii) *Selaginella***
c. Sphenopsida	**(iii) *Psilotum***
d. Psilopsida	**(iv) *Equisetum***

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

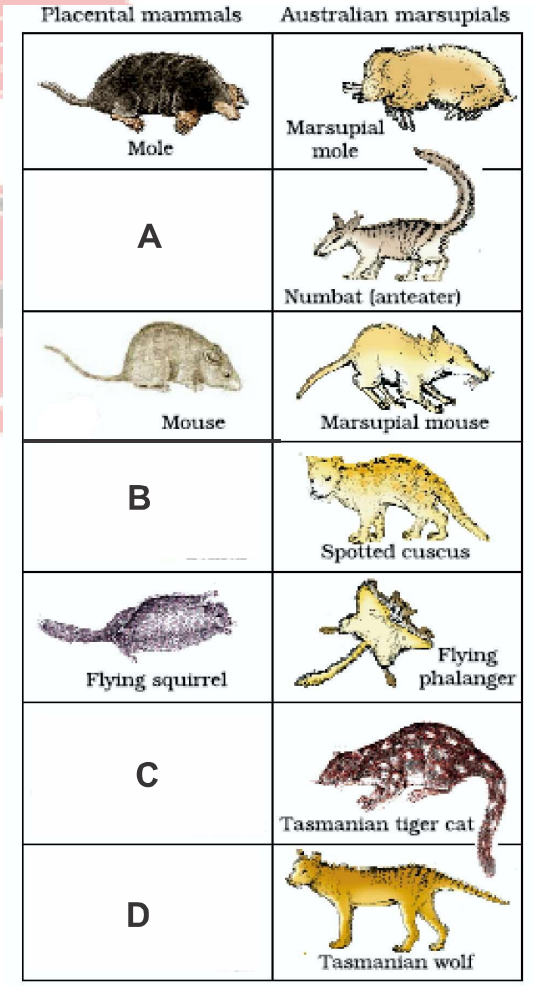
(3) a(ii), b(i), c(iv), d(iii) (4) a(ii), b(iii), c(iv), d(i)

156. Which one of the following factors are known to affect hardy - weinberg equilibrium:

(1) Gene migration (2) Mutation

(3) Natural selection (4) All of these

157. Select the correct option for the given diagram



(1) A–Lemur (2) A–Anteater

(3) C–Wolf (4) D–Bobcat

158. Which one of the following is the incorrect match regarding human blood group

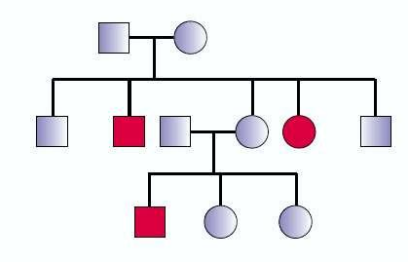
(1) Total type of allele – Three

(2) Total type of genotype possible – Six

(3) Total type of blood group – Four

(4) Total type of phenotype possible – Five

159. Which one of the following disease are related with the given pedigree



(1) Phenylketonuria

(2) Sickel cell anaemia

(3) Thalassemia

(4) All

160. Select the correct statement for the given diagram

a. It is related with mendelian disorder

b. It is related with sickle cell anaemia

c. It is related with haemoglobin

d. It is related with a type of mutation

(1) a, b, c, d

(2) Only a, b

(3) Only c, d

(4) Only a, b, c

161. Which one of the following are correct statement for the cancer

a. In cancer cells the contact inhibition property are lost

b. The chemical carcinogens present in tobacco smoke have been identified as a major cause of lung cancer

c. Cancer causing viruses called oncogenic viruses have genes called viral oncogenes

d. Ionising radiations like X-rays and non-ionising radiation like UV rays, gamma rays cause DNA damage leading to neoplastic transformation

e. Cancer is one of the most dreaded diseases of human beings

(1) a, b, c, e

(2) Only a, b, c

(3) Only a, b, e

(4) a, b, d, e

162. The function of secretion of prostate gland is to :

(1) Inhibit sperm activity

(2) Attract sperms

(3) Stimulate sperm activity

(4) Phagocytosis of sperms

163. Select the correct statement for family Mimosoideae

(1) Marginal placentation present

(2) Flower are hypogynous, pentamerous

(3) Anther are dithecous

(4) All

164. Plants show another interesting phenomenon. The living differentiated cells, that by now have lost the capacity to divide can regain the capacity of division under certain conditions. This phenomenon is termed as

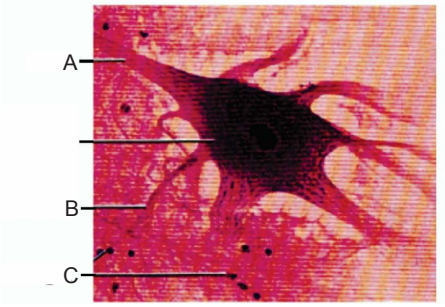
(1) Dedifferentiation

(2) Redifferentiation

(3) Differentiation

(4) Decapitations

165. Select the correct option for the given diagram



(1) A– Axon

(2) B–Dendrite

(3) C–Neuroglea

(4) All

166. The ring arrangement of vascular bundles is a characteristics of

(1) Dicot stem

(2) Dicot leaf

(3) Monocot stem

(4) Monocot leaf

167. Select the correct match

(1) Epiblema – Outermost layer in dicot root

(2) Mesophyll – Parenchyma

(3) Guard cell – Chlorophyll

(4) All

168. Given below are two statements

Statement I:

In a cell the nuclear pore are the passage through which movement of RNA and protein molecules takes place in both directions between the nucleus and the cytoplasm.

Statement II :

Normally there is only one nucleus per cell, variation in the number of nuclei are also frequently observed.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

169. Select the correct match

(1) Palmitic acid – Lipids

(2) Adenylic acid – Lipids

(3) Adenine – Amino acid

(4) Alanine – Nitrogen bases

170. The given below diagram of animal belongs to

(1) Annelida (2) Chordata

(3) Echinodermata (4) Mollusca

171. Statement -I- Reptiles are mostly terrestrial animals and their body is covered by dry and cornified skin, epidermal scales or scutes.

Statement-II- In reptiles heart is usually two chambered, but four chambered in crocodiles.

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

172. Which one of the following is Incorrect statement for artificial hybridisation :

(1) It is one of the major Approaches of crop improvement progammes.

(2) In this process emasculation and bagging techniques are involved

(3) If the female parent produces unisexual flowers there is more need for emasculation

(4) None of these

173. How many matching are correct

a. PPLO – Mitochondria, ER present

b. Mycoplasma – Chromosome present

c. Blue green algae – Centromere present

d. Mycoplasma – 70S ribosome present

(1) Four

(2) Three

(3) Two

(4) One

174. Which one of the following is odd for female reproductive structure in flowering plant

(1) Ovary

(2) Style

(3) Stigma

(4) Anther

175. How many statements are correct for double fertilisation :

a. The central cell after syngamy becomes the PEC and develops into the endosperm

b. The two process syngamy and triple fusion takes place in embryo sac

c. Two male gamete are involved

d. Filiform apparatus play important role

(1) Four

(2) Three

(3) One

(4) Two

176. Spermatids $\xrightarrow{x}$ spermatozoa

In the given process what is x :

(1) Second meiotic division

(2) Differentiation

(3) Mitosis

(4) Fragmentation

177. The maximum photosynthesis takes place in which region of the spectrum

(1) Blue and Red

(2) Blue and Green

(3) Green and Red

(4) Yellow and Green

178. If in a pond there were 50 water Hyacinth plant last year and through reproduction 10 new plants are added, taking the current population to 60. What is the birth rate for this plant :

(1) 0.4 offspring per plant per year

(2) 0.2 offspring per plant per year

(3) 0.5 offspring per plant per year

(4) 0.167 offspring per plant per year

179. Match the column - I with column - II and select the correct option from the codes given below :

	Column - I		Column - II
A.	Tidal volume	(i)	2500 - 3000 mL of air
B.	Inspiratory reserve volume	(ii)	1000 mL of air
C.	Expiratory reserve volume	(iii)	500 mL of air
D.	Residual volume	(iv)	4000 - 4600 mL of air
E.	Vital capacity	(v)	1100 - 1200 mL – of air

(1) A-(iii), B-(iv), C-(ii), D-(i), E-(v)

(2) A-(iii), B-(i), C-(ii), D-(v), E-(iv)

(3) A-(iii), B-(i), C-(iv), D-(v), E-(ii)

(4) A-(v), B-(i), C-(ii), D-(iii), E-(iv)

180. Match the Column 'A' with Column 'B' and select the answer from the options given below:

Column A		Column B
A. Lymphatic System	i.	Carries oxygenated blood
B. Pulmonary vein	ii.	Immune Response
C. Thrombocytes	iii.	To drain back the tissue fluid to the Blood circulatory system
D. Lymphocytes	iv.	Coagulation of blood

(1) A-ii, B-i, C-iii, D-iv

(2) A-iii, B-i, C-iv, D-ii

(3) A-iii, B-i, C-iii, D-iv

(4) A-ii, B-iv, C-iii, D-i

181. Match the following Columns :

	Column I	Column II
a.	Adenine derivative	i. Ethylene
b.	Terpenes derivatives	ii. Gibberellic acid
c.	Gaseous hormone	iii. Kinetin
d.	Carotenoid derivative	iv. Abscisic acid

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

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

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

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

182. Which one of the following is correct match

(1) crylAc - Cotton bollworm

(2) crylAb - Cotton bollworm

(3) crylIAb - Corn borer

(4) RNAi - Takes place only in prokaryotes

183. Given below are two statements

Statement I:

A bioreactor provides the optimal conditions for achieving the desired product by providing optimum growth conditions.

Statement II :

The most commonly used bioreactors are of stirring type.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

184. Which is a wrong statement :

(a) Endocrine glands have well developed ducts

(b) Goblet cells are exocrine gland

(c) Digestive enzymes are the endocrine secretion

(d) Cuboidal or columnar epithelium act as gland

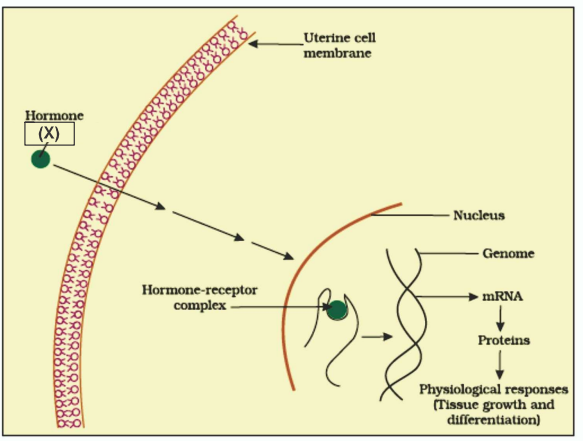
(1) a & b

(2) b & c

(3) a & c

(4) c & d

185. In the given diagram 'X' may be



(1) X–ANF

(2) X–TCT

(3) X–Insulin

(4) X–Estrogen

PART-2 (SECTION-B)

This section will have 15 questions. Candidate can choose to attempt any 10 question out of these 15 question. In case if candiate attempts more than 10 question, first 10 attempted question will be considered for marking.

186. **Statement -I-** Cyclostomes have a sucking and circular mouth without jaws.

Statement-II- Cyclostomes are terrestrial but migrate for spawning to fresh water

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

187. **How many of the following fungus known as imperfect fungi :**

***Rhizopus*, *Penicillium*, Yeast, *Mucor*, *Agaricus*, *Puccinia*, *Albugo*, *Claviceps*, *Neurospora*, *Alternaria*, *Trichoderma*, *Aspergillus*, *Ustilago*, Morels, Truffles, *Colletotrichum* :**

(1) 5

(2) 7

(3) 2

(4) 3

188. **Ectopic pregnancies are referred to as :**

(1) Implantation of defective embryo in the uterus

(2) Pregnancies terminated due to hormonal imbalance

(3) Pregnancies with genetic abnormality

(4) Implantation of embryo at site other than uterus

189. **Statement -I- Early greek thinkers thought units of life called spores were transferred to different planets including earth.**

Statement-II-For a long time it was also believed that life comes out of decaying and rotting matter like straw, mud etc. this was the theory of spontaneous generation.

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

190. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A):

Consciousness is a defining property of living beings.

Reason (R) :

Consciousness is present in all organism and totally absent in non livings

In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(2) (A) is correct but (R) is not correct

(3) (A) is not correct but (R) is correct

(4) Both (A) and (R) are correct and (R) is the correct explanation of (A)

191. Select the correct match

(A) Euglena	I. Photosynthetic protist
(B) Entamoeba	II. Parasitic protist
(C) Trypanosoma	III. Flagellated organism
(D) Mycoplasma	IV. Unicellular prokaryotic organism

(1) A-I, B-II, C-III, D-IV

(2) A-IV, B-II, C-III, D-I

(3) A-I, B-IV, C-III, D-II

(4) A-I, B-II, C-IV, D-III

192. Select the incorrect match

(1) Dicot stem	–	Open vascular bundles
(2) Monocot stem	–	Closed vascular bundles
(3) Root	–	Radial vascular bundle
(4) Only stem	–	Conjoint type of vascular bundles

193. Select the incorrect match

(1) Cartilage cell	–	Chondrocyte
(2) Mast cell	–	Areolar tissue
(3) Goblet cell	–	Alimentary canal
(4) Blood	–	Collagen fibre are present in rows

194. Which one of the following are Ex-situ conservation:

(1) Zoological parks

(2) Wild life safari parks

(3) Botanical garden

(4) All

195. Select the correct statement for the given diagram

(1) Chilled acetic acid used

(2) Very hot acetone used

(3) Chilled ethanol used

(4) Lactic acid used

196. How many matching are correct

a.	*Ascaris*	– Monogenetic life cycle
b.	*Wuchereria*	– Digenetic life cycle
c.	*Plasmodium*	– Digenetic life cycle
d.	Chikungunya	– Joint pain

(1) Three (2) Four

(3) Two (4) One

197. How many matching are correct

	Disease	**Symptom**
(a)	Typhoid	Stomach pain, constipation
(b)	Pneumonia	Fever, chills
(c)	Common cold	Nasal congestion, sore throat
(d)	Ascariasis	Blockage of the intestinal passage

(1) Three (2) Four

(3) One (4) Five

198. Given below are two statements

Statement I:

Biofertilisers are organisms that enrich the nutrient quality of the soil. The main sources of biofertilisers are bacteria, fungi and cyanobacteria.

Statement II :

The organic farmer holds the view that the eradication of the creatures that are often described as pests is not only possible, but also undesirable, for without them the beneficial predatory and parasitic insects which depend upon them as food or hosts would not be able to survive.

Choose the correct answer from the option given below:

(1) Both Statement I and Statement II are incorrect

(2) Statement I is correct but Statement II is incorrect

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

(4) Both Statement I and Statement II are correct

199. A characteristics mushroom shaped gland is present in the _____which functions as an Accessory reproductive gland :

Fill in the blank in the sentence :

(1) 6^{th} – 7^{th} abdominal segments

(2) 6^{th} – 7^{th} thoracic segments

(3) 16^{th} – 17^{th} abdominal segments

(4) 12^{th} – 15^{th} abdominal segments

200. Which of the following is/are effect of adrenaline

(1) Pupilary dilation

(2) Piloerection

(3) Sweating

(4) All

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