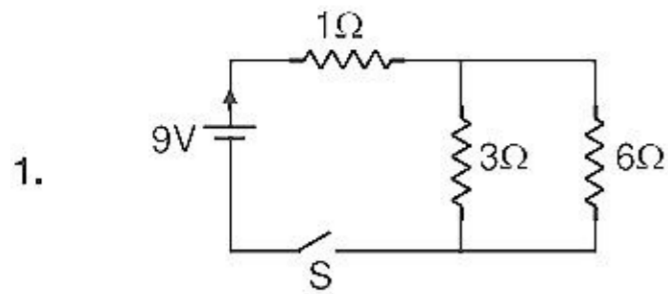


PART - A (PHYSICS)

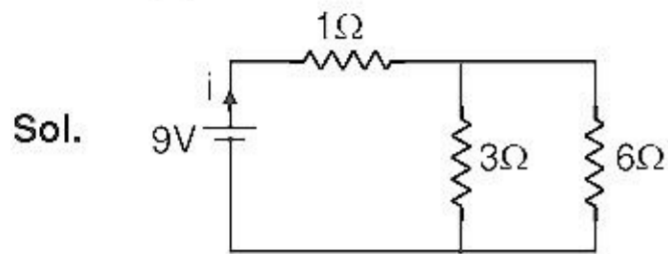
Total Number of Questions (33)



After switch is closed, current drawn from the battery is:

- (1) 6A (2) 1.5A (3) 3A (4) 4A

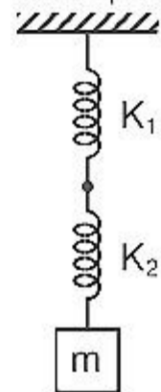
Ans. (3)



$$R_{eq} = 1\Omega + \frac{6 \times 3}{6 + 3} \Omega = 3\Omega$$

$$i = \frac{V}{R_{eq}} = \frac{9V}{3\Omega} = 3A$$

2. Time period of oscillation for given combination will be:



- (1) $2\pi \sqrt{\frac{m(K_1 + K_2)}{K_1 K_2}}$ (2) $2\pi \sqrt{\frac{m}{K_1 + K_2}}$ (3) $2\pi \sqrt{\frac{m K_1 K_2}{K_1 + K_2}}$ (4) $2\pi \sqrt{\frac{m K_1}{K_2}}$

Ans. (1)

Sol. For series combination

$$K_{eq} = \frac{K_1 K_2}{K_1 + K_2}$$

$$T = 2\pi \sqrt{\frac{m}{K_{eq}}} = 2\pi \sqrt{\frac{m(K_1 + K_2)}{K_1 K_2}}$$

3. For a wire $\frac{R}{\ell} = \frac{1}{2}$ and length of wire is $\ell = 5$ cm. If potential difference of 1 V is applied across it, current through wire will be: (R = Resistance)

- (1) 40A (2) 4A (3) 25A (4) 2.5A

Ans. (1)

Sol. $R = \frac{\ell}{2} \Omega = \frac{5 \times 10^{-2}}{2} \Omega$

$$i = \frac{V}{R} = \frac{1}{5 \times 10^{-2}} \times 2 = 40A$$

4. If modulation index $\mu = \frac{1}{2}$ and $V_M = 2$ then $V_C = ?$

- (1) 4 (2) 2 (3) 6 (4) 8

Ans. (1)

Sol. Modulation index = $\frac{V_M}{V_C} = \frac{1}{2}$

$$V_C = 2V_M$$

$$V_C = 2 \times 2 = 4$$

5. A body of mass 5×10^3 kg moving with speed 2 m/s collides with a body of mass 15×10^3 kg inelastically & sticks to it. Then loss in K.E. of the system will be:

- (1) 7.5 kJ (2) 15 kJ (3) 10 kJ (4) 5 kJ

Ans. (1)

Sol. Loss in K.E. = $\frac{1}{2} \frac{M_1 M_2}{M_1 + M_2} V^2 (1 - e^2)$

$$= \frac{1}{2} \times \frac{5 \times 10^3 \times 15 \times 10^3}{20 \times 10^3} \times (2)^2 \cdot (1 - (0)^2)$$

$$= \frac{1}{2} \times \frac{75 \times 10^3}{20} \times 4$$

$$= 7.5 \text{ kJ}$$

6. A disc of radius 5 m is rotating with angular frequency 10 rad/sec. A block of mass 2 kg is to be put on the disc friction coefficient between disc and block is $\mu_k = 0.4$, then find the maximum distance from axis where the block can be placed without sliding:

- (1) 2 cm (2) 3 cm (3) 4 cm (4) 6 cm

Ans. (3)

Sol. $\mu_k \cdot g = \omega^2 x$

$$0.4 \times 10 = (10)^2 \cdot x$$

$$x = \frac{4}{100} \text{ m} = 4 \text{ cm}$$

7. Angular magnification of telescope if focal length of objective and eye lenses are 10 cm and 10 mm respectively and tube length is 11 cm:

- (1) 10 (2) 5 (3) 100 (4) 50

Ans. (1)

Sol. Angular magnification = $\frac{f_o}{f_e} = \frac{10}{1} = 10$

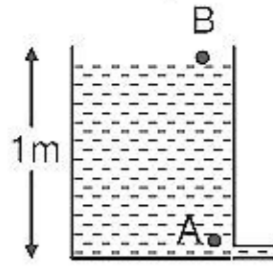
8. An electron is moving in a circle of radius 2m with speed 4 m/s. Find the acceleration of the electron:

- (1) 8 m/s^2 (2) 4 m/s^2 (3) 16 m/s^2 (4) 10 m/s^2

Ans. (1)

Sol. Acceleration of electron = $\frac{V^2}{R} = \frac{(4)^2}{2} = 8 \text{ m/s}^2$

9. A container of height 10 cm is filled with water. There is a hole at bottom. Find the pressure difference between points A & B:



- (1) 1000 Pa (2) zero (3) 1 Pa (4) 100 Pa

Ans. (1)

Sol. $P_A - P_B = \rho gh$
 $= 10^3 \times 10 \times 10 \times 10^{-2} \text{ Pa}$
 $= 1000 \text{ Pa}$

10. A coil is placed in y-z plane making an angle of 30° with x-axis. The current through coil is I, and number of turns are N. If a magnetic field of strength 'B' is applied in positive x-direction, then find the torque experienced by the coil: (Radius of coil is R)

($N = 100, I = 1\text{A}, R = 2\text{m}, B = \frac{1}{\pi} \text{T}$)

- (1) 100 N-m (2) 50 N-m (3) 200 N-m (4) 150 N-m

Ans. (3)

Sol. $NI(\vec{A} \times \vec{B})$
 $(\vec{\tau}) = NIAB\sin\theta$ ($\theta = 30^\circ$)
 $= NI \cdot \pi R^2 \cdot B \cdot \sin 30^\circ$
 $= \frac{\pi NIR^2 B}{2} \text{ N-m}$
 $= \frac{\pi \times 100 \times 1 \times (2)^2 \cdot \frac{1}{\pi}}{2}$
 $= 200 \text{ N-m}$

11. In YDSE $a = 2\text{mm}, D = 2\text{m}, \lambda = 500 \text{ nm}$. Find distance of point on screen from central maxima where intensity becomes 50% of central maxima

- (1) 1000 μm (2) 500 μm (3) 250 μm (4) 125 μm

Ans. (4)

Sol. $I = I_0 \cos^2 \frac{\phi}{2} = \frac{I_0}{2}$
 $\cos \frac{\phi}{2} = \frac{1}{\sqrt{2}}$
 $\frac{\phi}{2} = \frac{\pi}{4}$
 $\phi = \frac{\pi}{2}$
 $\Delta x = \frac{\lambda}{4}$
 $y = \frac{\beta}{4} = \frac{\lambda D}{4d} = \frac{500 \times 10^{-9} \times 2}{4 \times 2 \times 10^{-3}} = 125 \times 10^{-6} \text{ m}$
 $y = 125 \mu\text{m}$

12. A sample which has half life of 10^{33} year. If initial number of nuclei of the sample is 26×10^{24} . Then find out the number of nuclei decayed in 1 year.

- (1) 1.82×10^{-7} (2) 182×10^{-7} (3) 18.2×10^{-7} (4) 1820×10^{-7}

Ans. (3)

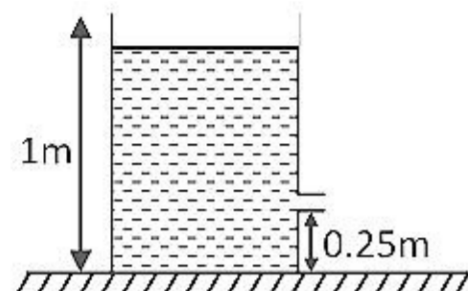
Sol. $-\frac{dN}{dt} = \lambda N$

$$-dN = \frac{\ln 2}{T} \times N \times dt$$

$$= \frac{0.7}{10^{33}} \times 26 \times 10^{24} \times 1$$

$$-dN = 0.7 \times 26 \times 10^{-7} = 18.2 \times 10^{-7}$$

13. If a small orifice is made at a height of 0.25 m from the ground, the horizontal range of water stream will be :-



- (1) 46.5 cm (2) 56.6 cm (3) 76.6 cm (4) 86.6 cm

Ans. (4)

Sol. $V = \sqrt{2gh} = \sqrt{2 \times 10 \times 0.75} = \sqrt{15}$

$$\text{Horizontal range} = V \sqrt{\frac{2H}{g}} = \sqrt{15} \sqrt{\frac{2 \times 0.25}{10}} = \sqrt{\frac{15}{20}} = \sqrt{\frac{3}{4}}$$

$$= \frac{1.732}{2} = 0.866\text{m}$$

14. A capacitor is connected to a battery of voltage V. Now a di-electric slab of di-electric constant k is completely inserted between the plates, then the final charge on the capacitor will be: (If initial charge is q_0)

- (1) $\frac{\epsilon_0 A}{d} V$ (2) $\frac{k\epsilon_0 A}{d} V$ (3) $\frac{\epsilon_0 A}{kd} V$ (4) zero

Ans. (2)

Sol. $q = C_1 V = \left(\frac{k\epsilon_0 A}{d} \right) V = Kq_0$

15. Unit of magnetic flux is :

- (1) Tesla (2) Gauss (3) Weber (4) Weber/m²

Ans. (3)

16. Calculate the mean % error in five observations :

80.0, 80.5, 81.0, 81.5, 82

- (1) 0.74% (2) 1.74% (3) 0.38% (4) 1.38%

Ans. (1)

Sol. Mean of the errors = $\frac{80 + 80.5 + 81 + 81.5 + 82}{5} = 81$

$$|80 - 81| = 1$$

$$|80.5 - 81| = 0.5$$

$$|81 - 81| = 0$$

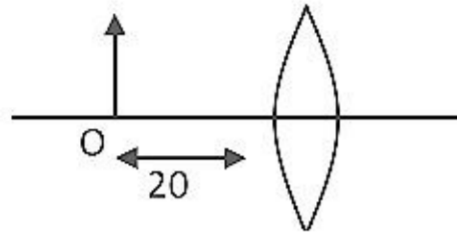
$$|81.5 - 81| = 0.5$$

$$|82 - 81| = 1$$

$$\text{Mean error} = \frac{1 + 0.5 + 0 + 0.5 + 1}{5} = 0.6$$

$$\% \text{ errors} = \frac{0.6}{81} \times 100 = 0.74\%$$

17. Calculate focal length of given lens if the magnification is -0.5 .



- Ans. (1) 6.66 cm (2) 5.44 cm (3) 3.88 cm (4) 1.38 cm

Sol. Magnification for lens = $\frac{f}{u+f} \Rightarrow -\frac{1}{2} = \frac{f}{-20+f}$

$$-20 + f = -2f$$

$$-20 = -3f$$

$$f = 20/3$$

$$= 6.66 \text{ cm}$$

18. Transformer \rightarrow ideal $\rightarrow E_p = 1000\text{V}, I_p = 50\text{A}$
 $220\text{V} \rightarrow 80$ houses

Resistance of secondary coil will be:

- Ans. (1) 2Ω (2) 3Ω (3) 1Ω (4) 4Ω

Sol. $P_{in} = P_{out}$

$$E_p I_p = \frac{V_s^2}{R_s}$$

$$1000 \times 50 = \frac{220^2}{R_s}$$

$$R_s = \frac{22^2}{10 \times 50} = 0.968 \Omega \approx 1 \Omega \text{ Ans.}$$

19. Dimension of magnetic flux.

- Ans. (1) $MT^{-1}L^2Q^{-1}$ (2) $MT^{-2}L^3Q^{-1}$ (3) $MT^{-1}L^{-1}Q$ (4) MTL^2Q

Sol. $\phi = BA = \frac{F}{qv} \times A = \frac{ML^{-2}T \times L^2}{Q \times LT^{-1}} = MT^{-1}L^2Q^{-1}$

20. At which excited state of Be^{3-} radius of e^- will be same as H atoms and electron in ground state.

- Ans. (1) 1 (2) 2 (3) 3 (4) 4

Sol. $z = 84$ $r = r_0 \times \frac{n^2}{z}$

$$N = ? \quad n^2 = z$$

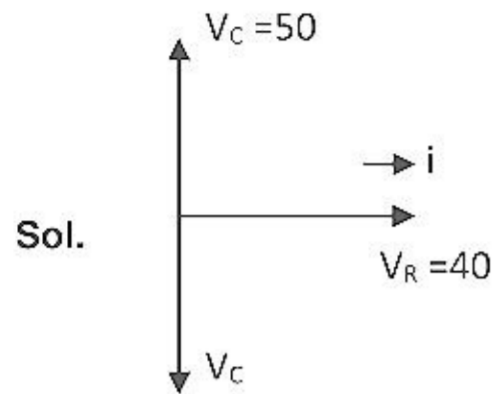
$$N = 2$$

So first excited state

21. In LCR series circuit source voltage is 120 volt and voltage in inductor 50 volt and resistance is 40 volt, then determine voltage in capacitor.

(1) $V_C = 10(5 - 8\sqrt{2})$ (2) $V_C = 10(5 + 8\sqrt{2})$ (3) $V_C = 20(5 + 8\sqrt{2})$ (4) $V_C = 10(5 + 7\sqrt{2})$

Ans. (2)



$$120^2 = 40^2 + (V_C - 50)^2$$

$$10^2 (9 - 1) = (V_C - 50)^2$$

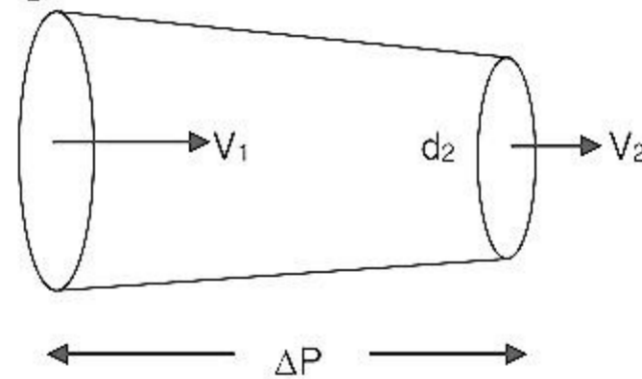
$$V_C = 40\sqrt{8} + 50$$

$$V_C = 10(5 + 8\sqrt{2})$$

22. Determine the pressure difference in tube of non-uniform cross sectional area as shown in figure.

$$\Delta P = ?$$

$$d_1 = 5 \text{ cm}, V_1 = 4, d_2 = 2 \text{ cm}, V_2 = ?$$



(1) 304200 Pa

(2) 304500 Pa

(3) 302500 Pa

(4) 303500 Pa

Ans. (2)

Sol. $A_1 V_1 = A_2 V_2$

$$5^2 \times 4 = 2^2 \times V_2$$

$$V_2 = 25$$

$$P_1 + \frac{1}{2} \rho V_1^2 = P_2 + \frac{1}{2} \rho V_2^2$$

$$P_1 - P_2 = \frac{1}{2} \rho (V_2^2 - V_1^2)$$

$$= \frac{1}{2} \times 10^3 (25^2 - 4^2)$$

$$= 500 (625 - 16)$$

$$P_1 - P_2 = 500 \times 609 = 304500 \text{ Pa}$$

23. $mx^2 - bx + k = 0$
Find time after which to the energy will become half of initial maximum value in damped forced oscillation.

(1) $t = \frac{m}{b} + \frac{1}{2} \ln 2$ (2) $t = \frac{m}{b} \times \frac{2}{3} \ln 2$ (3) $t = \frac{m}{b} - \frac{1}{2} \ln 2$ (4) $t = \frac{m}{b} \times \frac{1}{2} \ln 2$

Ans. (4)

Sol. $\frac{1}{\sqrt{2}} = e^{-bt/m}$
 $\ln \sqrt{2} = \frac{bt}{m}$
 $t = \frac{m}{b} \times \frac{1}{2} \ln 2$

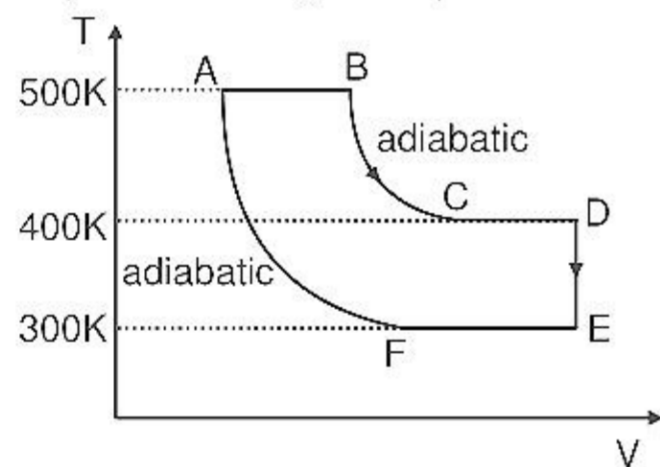
24. α particle is revolving in radius r with frequency f then find value of magnetic dipole moment.

(1) $2evr$ (2) evr (3) $3evr$ (4) $4evr$

Ans. (2)

Sol. $M = i \times \pi r^2$
 $= \frac{2e}{2\pi r} \times V \times \pi r^2$
 $= \frac{2evr}{2}$
 $= evr$

25. In given thermodynamic process determine efficiency of cycle.



AB, EF, CD → isothermal

$$\eta = \frac{Q_1 - Q_2}{Q_1} = ?$$

Sol. Determine efficiency of given cyclic process.

$$Q_{DE} = \Delta U = \frac{f}{2} nR(-100)$$

$$Q_{AB} = nR \times 500 \ln \frac{V_B}{V_A}$$

$$Q_{CD} = nR \times 400 \ln \frac{V_D}{V_C}$$

$$Q_{EF} = nR \times 300 \ln \frac{V_F}{V_E}$$

$$Q_1 = nR \times 500 \ln \frac{V_B}{V_A} + nR \times 400 \ln \frac{V_D}{V_C}$$

$$Q_2 = \frac{f}{2} AR \times 100 + nR \times 300 \ln \frac{V_E}{V_F}$$

$$\frac{V_B}{V_C} = \left(\frac{T_C}{T_B} \right)^{\gamma-1} = \left(\frac{400}{500} \right)^{\gamma-1}, \frac{V_A}{V_F} = \left(\frac{300}{500} \right)^{\gamma-1}$$

$$\eta = \frac{Q_1 - Q_2}{Q_1}$$

26. Determine coefficient of performance of given temperature limit.

$T_1 = 27^\circ\text{C}$ [outside fridge]

$T_2 = -23^\circ\text{C}$ [inside fridge]

(1) 4

(2) 5

(3) 6

(4) 7

Ans. (2)

Sol. COP = ?

$T_1 = 300 \text{ K}$

$T_2 = 250 \text{ K}$

$$\text{COP} = \frac{Q_2}{Q_1 - Q_2}$$

$$= \frac{T_2}{T_1 - T_2}$$

$$= \frac{250}{50}$$

$$\text{COP} = 5$$

27. **Assertion** : A charge particle is released from rest in magnetic field then it will move in circular path.

Reason : Work done by magnetic field is non zero.

Ans. (4)

28. **Assertion** : Water drop stick to glass surface.

Reason : Water have properties of surface tension.

Ans. (2)

29. **Assertion** : Photodiode current work in reverse bias.

Reason : Change in diode increases with increase in intensity.

Ans. (2)

30. **Assertion**: Coefficient of performance in refrigerator may be greater than one.

Reason: Heat extracted from lower temperature reservoir.

Ans. (2)

31. **Assertion**: Binding energy increase with increases atomic mass number.

Reason: Density of nucleus increase with increases in atomic mass number.

Ans. (3)

32. **Assertion**: When electron and holes combine then this reaction is exothermic.

Reason: Hole electron can not combine.

Ans. (3)

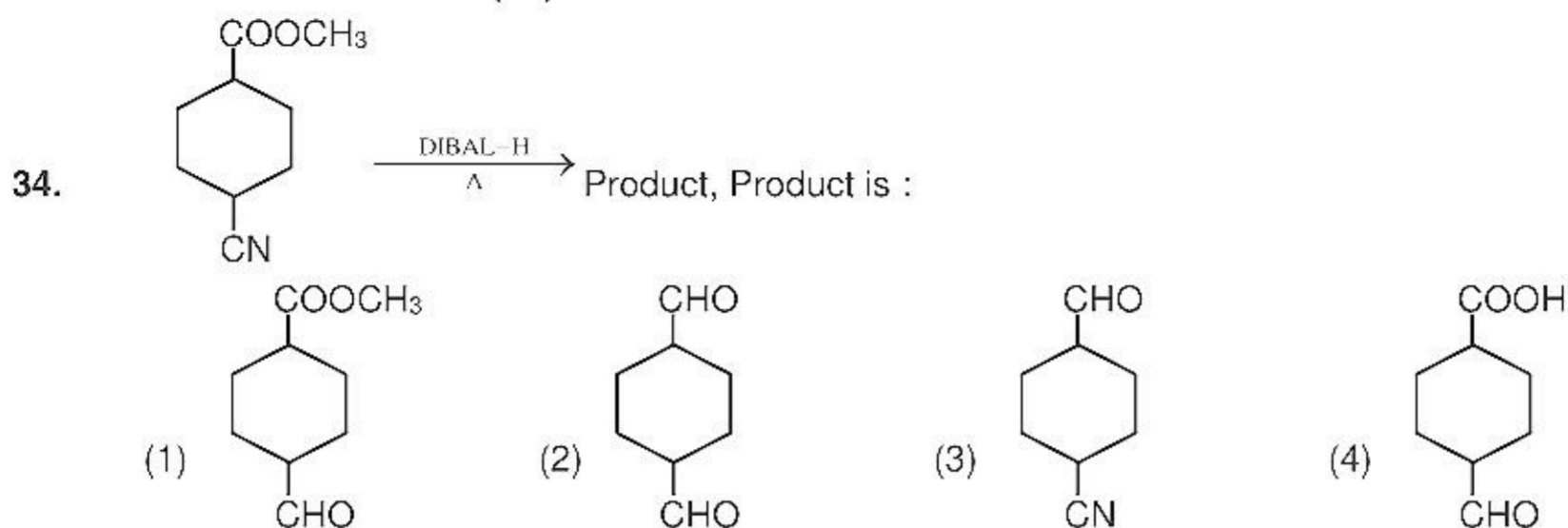
33. **Assertion** : Binding energy per unit nucleon increases with increase in atomic mass number.

Reason : Density of nucleus increases with increase in mass number.

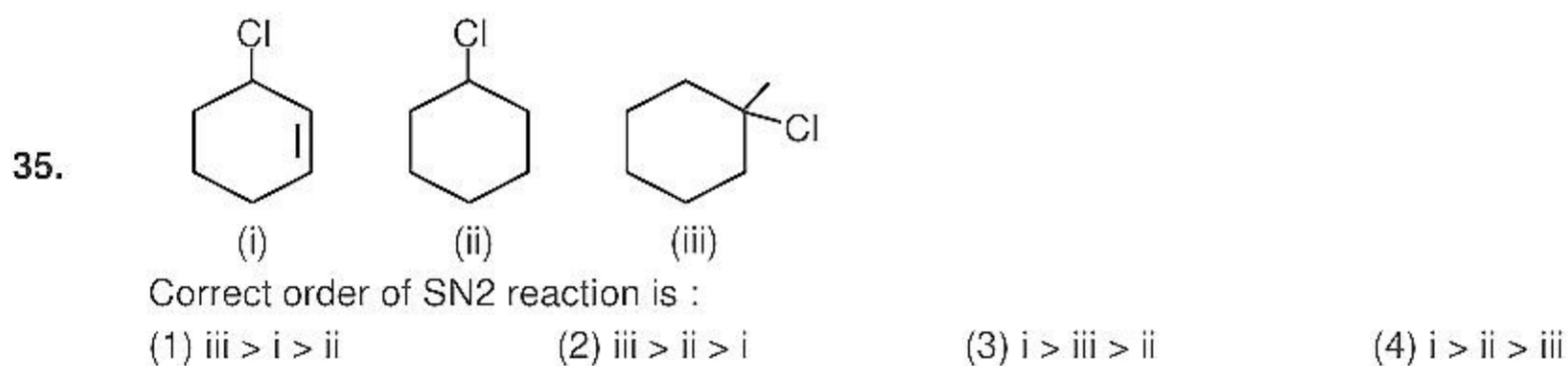
Ans. (4)

PART - B (CHEMISTRY)

Total Number of Questions (37)



Ans. (2)



Ans. (4)

36. **Assertion :** Phenol is more acidic than m-methoxy phenol
Reason : -OCH₃ shows +I effect

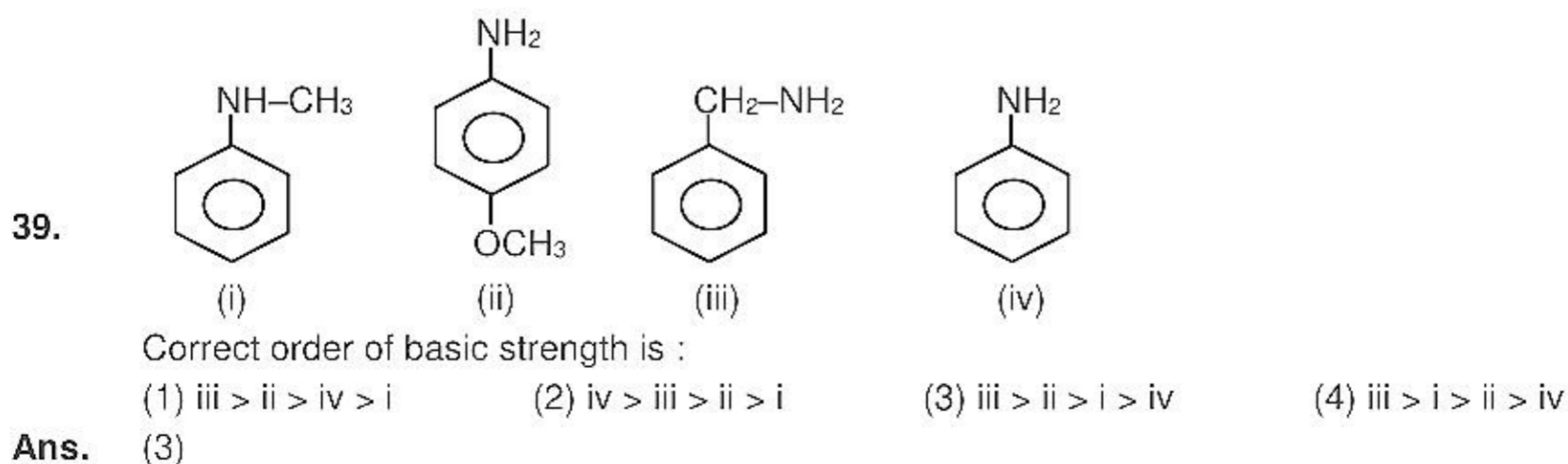
Ans. (4)

37. **Assertion :** Glyceraldehyde reacts with Br₂/H₂O to form achiral compound
Reason : -CHO and -CH₂OH both are oxidized

Ans. (3)

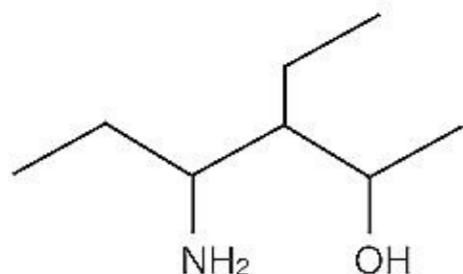
38. **Assertion :** Propene reacts with HI in presence of peroxide give 1-iodopropane.
Reason : 1^o free radical is less stable than 2^o free radical

Ans. (4)



Ans. (3)

40.



IUPAC name of give compound :

(1) 3-Ethyl-4-Amino-hexan-2-ol

(2) 3-Amino-4-Ethyl-hexan-5-ol

(3) 2-hydroxy-4-Amino hexane

(4) 4-Amino-3-ethyl hexan-2-ol

Ans. (4)

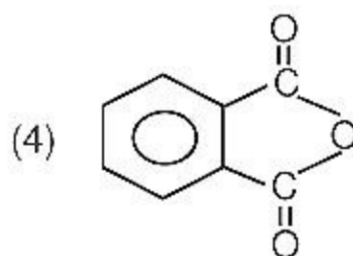
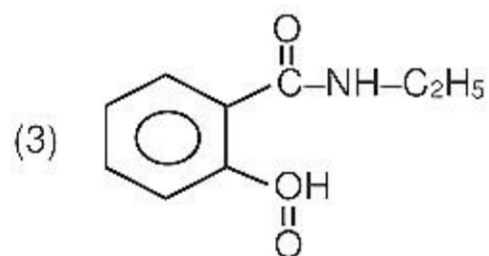
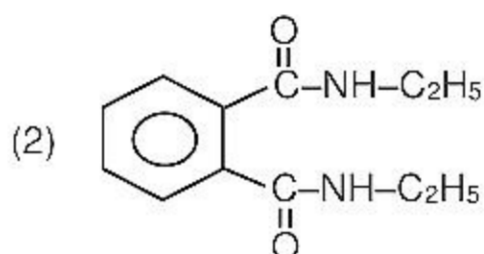
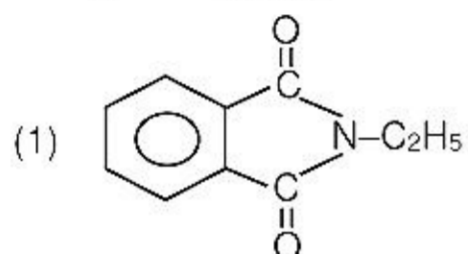
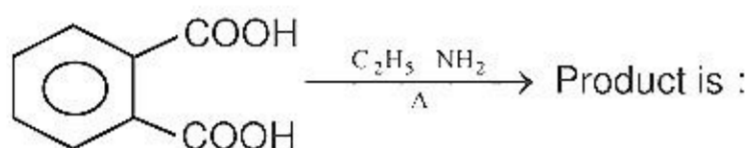
41. **Assertion :** Anhydrides are more reactive than ester for nucleophilic substitution**Reason :** R.COO⁻ is better leaving group than R-O⁻

Ans. (1)

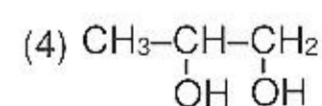
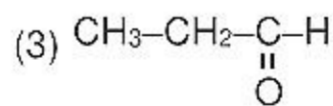
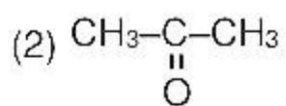
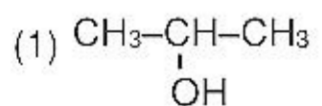
42. **Assertion :** m-Bromo toluene can be prepared by m-toluidene**Reason :** Amino group is meta directing

Ans. (3)

43.



Ans. (1)

44. $\text{CH}_3\text{-C}\equiv\text{CH} \xrightarrow{2\text{HBr}} \xrightarrow{\text{H}_2\text{O}}$ Product, Product is :

Ans. (2)

45. Which is the chemical test for polysaccharide

(1) Iodine solution

(2) Ninhydrine test

(3) Tollen's test

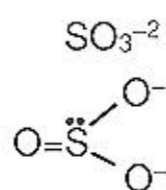
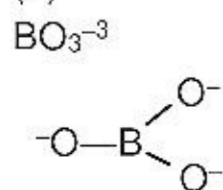
(4) Banedict solution

Ans. (1)

46. **Assertion :** BO_3^{-3} and SO_3^{-2} are not isostructural**Reason :** In SO_3^{2-} sulphur has one lone pair of electron

Ans. (1)

Sol.



bp = 3
 lp = 0
 total = 3
 sp²
 Trigonal planar

bp = 3
 lp = 1
 total = 4
 sp³
 pyramidal

47. **Assertion :** Vapour pressure of solvent increases when solvent B is added.
Reason : B is more volatile therefore vapour pressure of B is greater than of A.

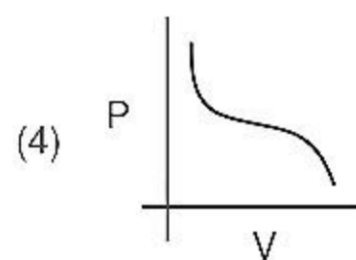
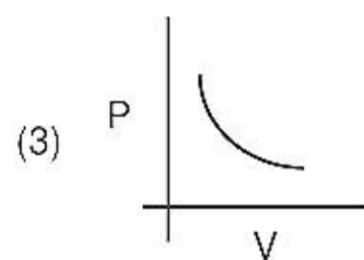
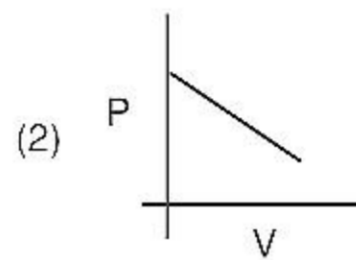
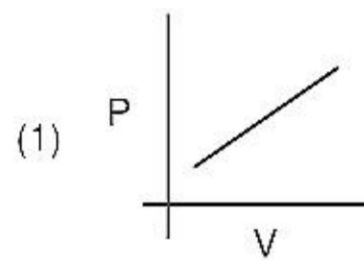
Ans. (1)

48. H₂O₂ is obtained by which of the following
 (1) BaO₂ (2) MnO₂ (3) SeO₂ (4) TeO₂

Ans. (1)

Sol. BaO₂·8H₂O(s) + H₂SO₄(aq) → BaSO₄(s) + H₂O₂(aq) + 8H₂O(l)

49. Graph between P & V below critical temperature is :



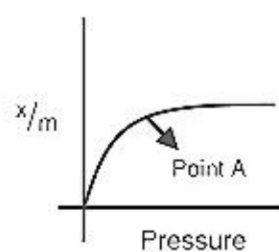
Ans. (4)

50. At what temperature rate becomes double than at 300 K ? Given $\ln k = 10 - \frac{69(\text{KJ})}{RT}$

(1) 329 (2) 307.7
 (3) 292.03 (4) 323.5

Ans. (2)

51. a graph plot between $\frac{x}{m}$ and pressure



The value of n at point A is

(1) 2 (2) 1 (3) $\frac{1}{2}$ (4) 3

Ans. (1)

52. **Assertion :** U is state function
Reason : T is an intensive property

Ans. (2)

53. **Assertion :** In a process, if work = 0 then $\Delta U = q$
Reason : q is difference between initial state and final state of a system.

Ans. ()

54. Which alkali metal during flame test will show colour corresponding to maximum wavelength?

- (1) Li
- (2) Na
- (3) K
- (4) Cs

Ans. (1)

Sol. Li – Crimson Red (Maximum λ)

Na – Golden Yellow

K – Violet

Cs – Blue

55. Which pair of elements has maximum electronegativity difference?

- (1) Li & F
- (2) Na & F
- (3) Na & Br
- (4) Na & Cl

Ans. (2)

Sol. Among Li & Na, Na is more electropositive

Among F, Cl & Br, F is most electronegative.

So, Na & F will have maximum electronegativity difference.

EN value =	F	Cl	Br	I	Li	Na
	4	3	2.8	2.5	1	0.9

56. Which of the following complexes has maximum CFSE?

- (1) $K_3[Fe(CN)_6]$
- (2) $K_3[Co(Ox)_3]$
- (3) $K_3[CoF_6]$
- (4) $K_3[Co(CN)_6]$

Ans. (1)

57. NH_3 reacts with bleaching powder to give :

- (1) N_2
- (2) $Ca(OH)_2$
- (3) NCl_3
- (4) O_2

Ans. (1)

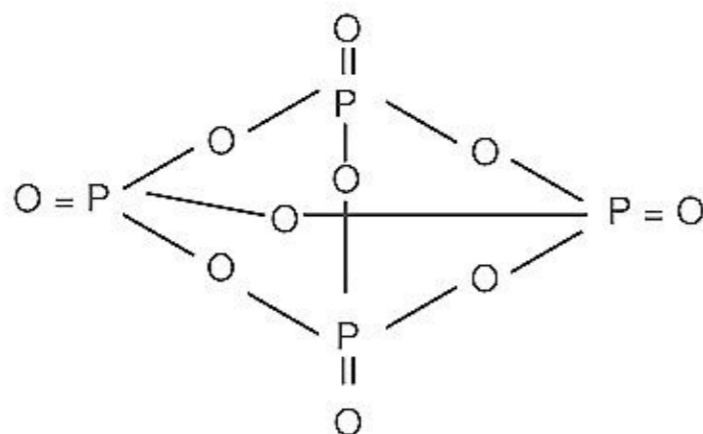
Sol. $3CaOCl_2 + 2NH_3 \longrightarrow 3CaCl_2 + N_2 + 3H_2O$

58. In dimer of phosphorus pentoxide, in what order number of P–P, P=O & P–O–P bonds are there?

- (1) P–O–P > P=O > P–P
- (2) P=O > P–O–P > P–P
- (3) P–O–P > P–P > P=O
- (4) P=O > P–P > P–O–P

Ans. (1)

Sol.



Total P–O–P bond = 6

Total P=O bonds = 4

Total P–P bonds = 0

59. For the reaction : $A + 2B \longrightarrow C + D$, the expression of rate of reaction will be :

(1) $\frac{-1}{1} \frac{d[A]}{dt} = \frac{-1}{2} \frac{d[B]}{dt}$ (2) $\frac{1}{1} \frac{d[A]}{dt} = \frac{-1}{2} \frac{d[B]}{dt}$

(3) $\frac{-1}{1} \frac{d[A]}{dt} = \frac{1}{2} \frac{d[B]}{dt}$ (4) $\frac{1}{1} \frac{d[A]}{dt} = \frac{-1}{2} \frac{d[B]}{dt}$

60. In FCC, distance between nearest tetrahedral voids is :

(1) $\frac{a}{2}$ (2) a (3) $\frac{\sqrt{3}a}{2}$ (4) $\frac{\sqrt{3}a}{4}$

Ans. (1)

61. For the endothermic reaction $A_2 \longrightarrow 2A$, which of the following will increase yield of monomer?

- (1) Increase in both temperature and concentration of reactant.
(2) Increase in temperature and decrease in concentration of reactant.
(3) Decrease in temperature and increase in concentration of reactant.
(4) Decrease in both temperature and concentration of reactant.

Ans. (1)

62. Difference in ionization energy & ionisation enthalpy is :

(1) Zero (2) $\frac{5}{2}RT$ (3) $\frac{3}{2}RT$ (4) None

Ans. (2)

63. In $Fe(CO)_5$ $Cr(CO)_6$, how many CO ligands can be replaced by NO?

(1) 3, 3 (2) 3, 6 (3) 6, 3 (4) 2, 4

Ans. (4)

64. Which of the following has maximum iron content?

(1) Cast Iron (2) Wrought Iron (3) Pig Iron (4) Stainless steel

Ans. (2)

65. Calculate Molarity of a 63% W/W HNO_3 solution if density is 5.4 g/mL :

(1) 14 M (2) 12 M (3) 10 M (4) 8 M

Ans. (1)

Sol. $M = \frac{\%w.w \times d \times 10}{M_{solute}} = \frac{63 \times 1.4 \times 10}{63} = 6.5$

66. pH of a salt solution of weak acid ($pK_a = 4$) & weak base ($pK_b = 5$) at 25°C is :
 (1) 6.5 (2) 6 (3) 7 (4) 7.5

Ans. (1)

Sol.
$$\text{pH} = \frac{1}{2} (\text{pK}_w + \text{pK}_a - \text{pK}_b) = \frac{1}{2} (14 + 4 - 5) = 6.5$$

67. Radius of 1st orbit of H & some orbit of Be^{3+} is same. Energy of their orbit of Be^{3+} is :
 (1) -54.4 eV (2) -13.6 eV (3) -108.8 eV (4) -27.2 eV

Ans. (1)

Sol. $(r_1)_\text{H} = (r_n)_{\text{Be}^{3+}}$

$$\frac{1^2}{1} = \frac{n^2}{4} \therefore n = 2$$

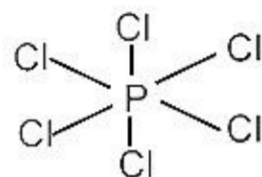
$$(E_2)_{\text{Be}^{3+}} = -13.6 \left(\frac{Z^2}{n^2} \right) = -13.6 \left(\frac{4^2}{2^2} \right) = -54.4 \text{ eV}$$

68. Select the correct statement regarding shapes of PCl_5 , BrF_5 & IF_7 :

- (1) All are square pyramidal (2) All are trigonal bipyramidal
 (3) One of the following is square pyramidal (4) one of the following is tetrahedral

Ans. (3)

Sol. **PCl_5**



bp = 5

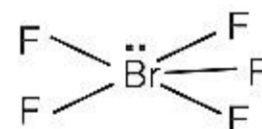
lp = 0

Total = 5

sp^3d

Trigonal bipyramidal

BrF_5



bp = 5

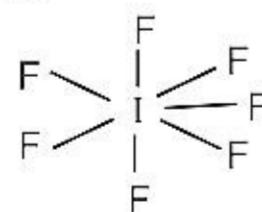
lp = 1

Total = 6

sp^3d^2

square pyramidal

IF_7



bp = 7

lp = 0

total = 7

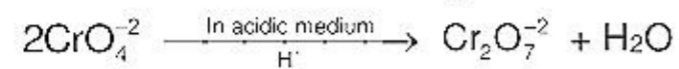
sp^3d^3

pentagonal bipyramidal.

69. Which of the following is incorrect about $K_2Cr_2O_7$?
- (1) It can be prepared from K_2CrO_4 . (2) It is used in redox titrations.
(3) It is stable in both acid & base. (4) It is orange in colour

Ans. (3)

Sol. Colour of $K_2Cr_2O_7$ is orange



(chromate ion) (Dichromate ion)

$K_2Cr_2O_7$ is used in redox titrations.

70. The conductivity of a 0.05 M solution of a weak monobasic acid is $10^{-3} \text{ } 5\text{cm}^{-1}$. If λ_m^∞ for weak acid is $500 \text{ } 5\text{cm}^2 \text{ mol}^{-1}$, calculate K_a of weak monobasic acid :

- (1) 8×10^{-5} (2) 4×10^{-6} (3) 16×10^{-7} (4) 14×10^{-8}

Ans. (1)

AIIMS-2019 BIOLOGY (26-05-19) 2nd SHIFT

PART - C (BIOLOGY)

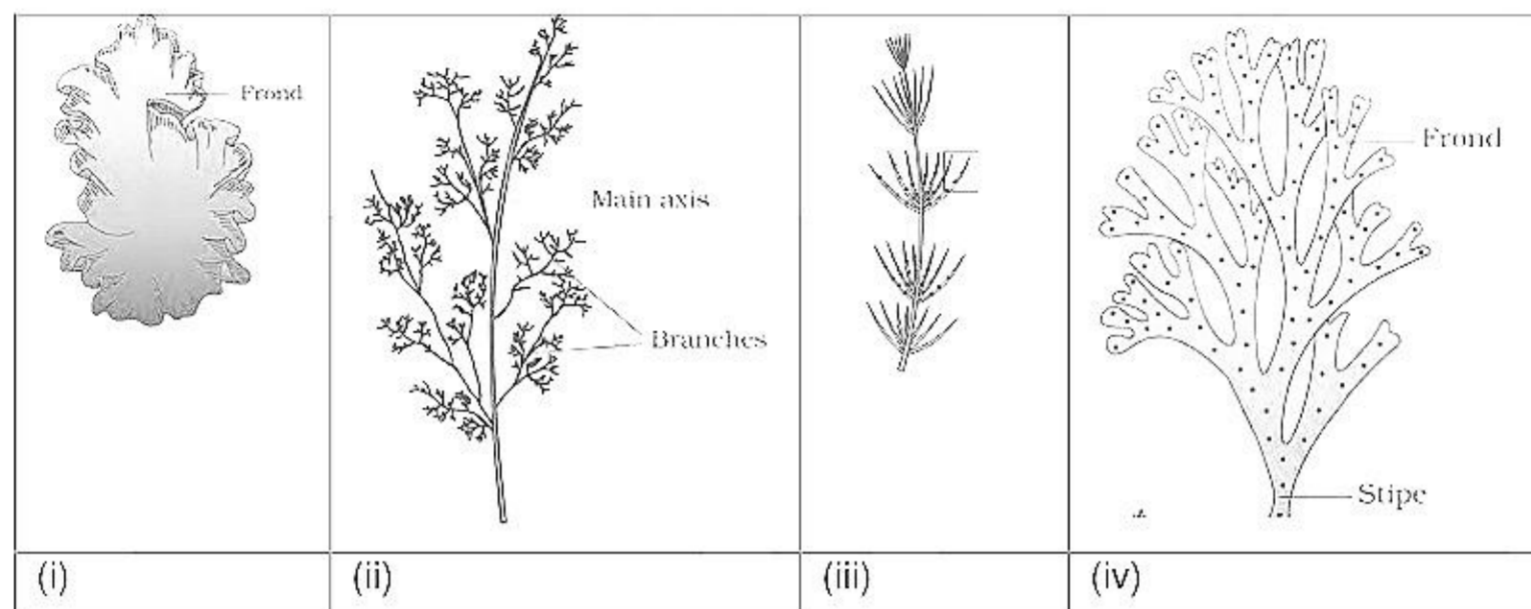
Total Number of Questions (46)

71. Gene library or DNA library has collection of

- (1) DNA and RNA (2) Any one type of gene of Organism
 (3) c DNA only (4) All possible genes of all organisms

Ans (3)

72. Identify the diagrams



- (1) (i) - Porphyra, (ii) - Polysiphonia, (iii) - Chara, (iv) - Dictyota
 (2) (i) - Polysiphonia, (ii) - Porphyra, (iii) - Chara, (iv) - Ectocarpus
 (3) (i) -Laminaria, (ii) - Polysiphonia, (iii) - chlamidomonas, (iv) - Fucus
 (4) (i) - Dictyota, (ii) - Polysiphonia, (iii) - Chara, (iv) - Porphyra

Ans. (1)

73. Which hormone inhibit morphogenesis

- (1) ABA (2) 2,4-D (3) Jasmonic acid (4) IBA

Ans. (1)

74. Which increase shoot growth in callus culture?

- (1) Cytokinin (2) Auxin (3) Gibberellin (4) ABA

Ans. (1)

75. Match the following

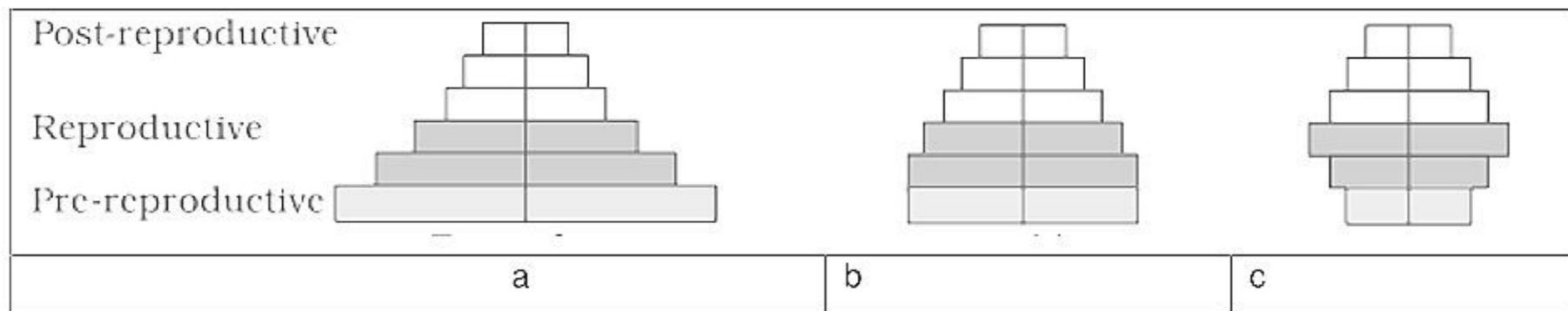
	Column-I		Column-II
(i)	Tap root	(a)	Sweet potato
(ii)	Adventitious root	(b)	Turnip
(iii)	Stem	(c)	Wheat
(iv)	Fibrous root	(d)	Potato

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

Ans. (3)

76. Which gas is present predominantly in biogas
 (1) Methane (2) Ethane (3) Butane (4) Propane
Ans. (1)
77. Which is similar term to Hybrid vigour?
 (1) Heterosis (2) Homozygosity (3) Heterozygosity (4) Homosis
Ans. (1)
78. Which of the following switch off lac operon
 (1) Structural gene (2) Regulator gene (3) Operator gene (4) Promoter gene
Ans. (2)
79. Which of the following is incorrect
 (1) Mango and coconut are drupe fruit
 (2) According to Euro norm IV sulphur content for petrol is 50 ppm
 (3) CO₂ and other poisonous gases cause pollution
 (4) Apple is a true fruit
Ans. (4)
80. Which gases are responsible for increasing the temperature of atmosphere?
 (1) CO, NO₂, H₂S (2) CO₂, CO, NO (3) CH₄, CO₂, N₂O (4) NO₂, H₂S, CO₂
Ans. (3)
81. Which statement is correct
 (1) Mycoplasma is smallest and wall less living organism
 (2) Influenza and herpes caused by virus having DNA and RNA
 (3) *Nostoc* and *Anabaena* are important decomposer
 (4) Methanogen are methane producing bacteria in wheat crop.
Ans. (1)
82. Match the column-I and column-II
- | Column-I | Column-II |
|----------------------------|----------------------------|
| (i) <i>Agaricus</i> | (a) Ascomycetes |
| (ii) <i>Colletotrichum</i> | (b) Deuteromycetes |
| (iii) <i>Albugo</i> | (c) Phycomycetes |
| (iv) <i>Neurospora</i> | (d) Basidiomycetes |
| (1) i-b, ii-a, iii-c, iv-d | (2) i-a, ii-b, iii-d, iv-c |
| (3) i-c, ii-b, iii-d, iv-a | (4) i-d, ii-b, iii-c, iv-a |
- Ans. (4)**

83.



Select the correct option w.r.t. Age pyramids.

- (1) a - Expanding, b - stable, c - Declining (2) a - stable, b - Expanding, c - Declining
 (3) a - stable, b - Declining, c - Expanding (4) a - Declining, b - stable, c - Expanding

Ans (1)

84. Select the correct match

(I)	(II)	(III)
(a) +	(i) -	(P) Amensalism
(b) -	(ii) -	(Q) Commensalism
(c) -	(iii) 0	(R) Predation
(d) +	(iv) 0	(S) Competition

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

Ans. (1)

85. Match the column-I and column-II

Column-I

- (i) Viroid
 (ii) Cell
 (iii) Virus
 (iv) Triple helical structure of collagen

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

Column-II

- (a) Ramachandran
 (b) Leewenhoek
 (c) T.O. Diener
 (d) Ivanowsky
 (2) i-a, ii-b, iii-d, iv-c
 (4) i-d, ii-b, iii-c, iv-a

Ans. (3)

86. The genetic codes of arginine are :

- (1) CGU, CGC, CGA (2) CAU, CAC, CAA
 (3) AGU, AGC, AAC (4) GAU, GAC, GAA

Ans. (1)

87. King of spices is :

- (1) *Brassica nigra* (2) *Piper nigrum*
 (3) *Piper longum* (4) *Curcuma longa*

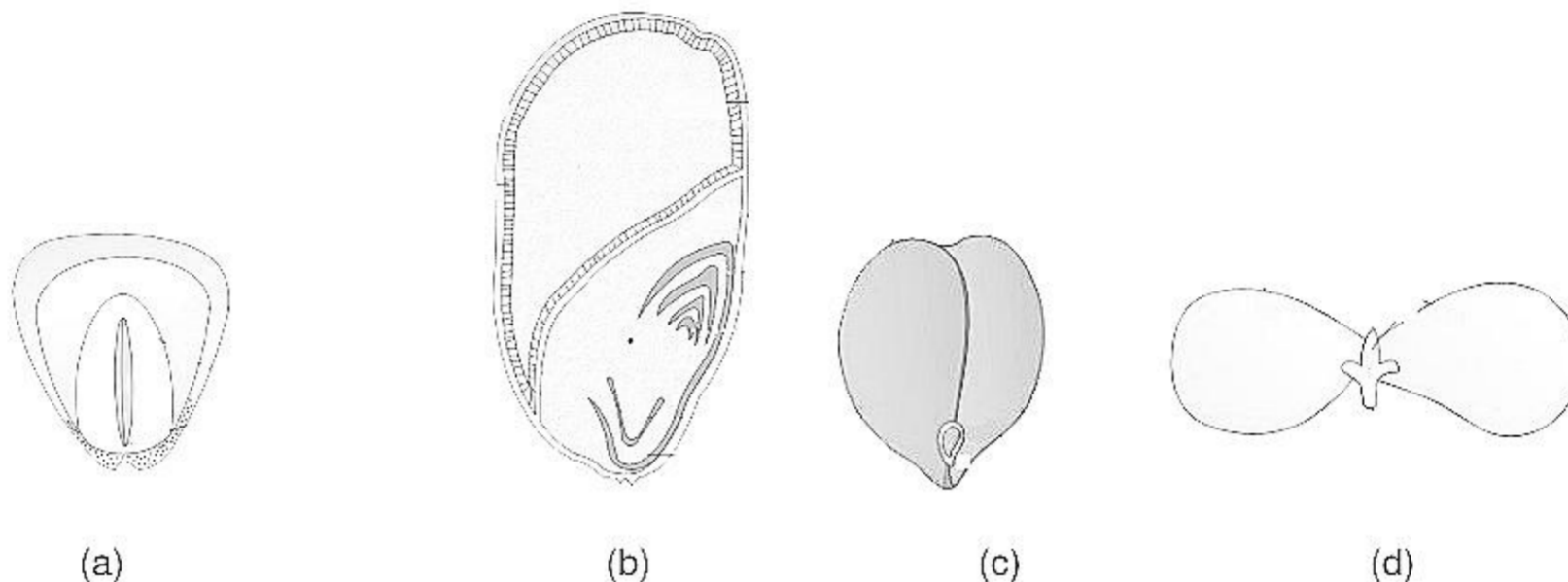
Ans. (2)

88. Which of the following is not found in maize seed :
 (1) Coleorhiza (2) Coleoptile (3) Scutellum (4) Perisperm

Ans. (4)

89. What product is formed when NH_4^+ reacts with α -ketoglutaric acid
 (1) Glutamate (2) Fumarate (3) Pyruvate (4) Glutamine

Ans. (1)



90.

Which of the following is correct for above diagrams :

- (1) a & b represent ex-albuminous seeds (2) c & d represent albuminous seeds
 (3) a & b represent albuminous seeds (4) c & d represent perispermic seeds

Ans. (3)

91. Match the column-I and column-II

	Column-I		Column-II
(i)	Chrysophyta	(a)	Fungi
(ii)	Gonyaulax	(b)	Diatom
(iii)	Penicillium	(c)	Plasmodium
(iv)	Slime mould	(d)	Dinoflagellate

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

Ans. (4)

92. **Assertion** : In C_4 cycle, first stable product has 4 carbon compound

Reason : In C_4 plants, C_3 cycle is absent

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
 (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
 (3) If assertion is true but reason is false.
 (4) If both assertion and reason are false.

Ans. (3)

93. **Assertion** : Mercury vapour emitting out from scrubber pollute environment

Reason : Scrubber cannot trap mercury vapour

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans. (4)

94. **Assertion** : Annual rings are used to calculate the age of tree.

Reason : Secondary growth is not found in Bamboo

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans. (2)

95. **Assertion** : Glomus show symbiotic association with higher plants.

Reason : Azospirillum and Azotobacter are free living nitrogen fixing bacteria.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans. (2)

96. **Assertion** : Sanitary landfill is beneficial for waste disposal

Reason : Bacteria present in sanitary waste decompose it and used as fertilizers

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans. (2)

97. **Assertion** : Glyoxisome, sphaerosome, lysosome are surrounded by single membrane.

Reason : Quantasome present in chloroplast.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans. (2)

98. **Assertion** : Eukaryotes contain membrane bound cell organelles and linear chromosome present in nucleus.

Reason : In prokaryotes nucleus is present.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans. (3)

99. Which cannot be used for direct gene transfer

- (1) Biolistics (gene gun)
- (2) Microinjection
- (3) Electroporation
- (4) *Agrobacterium tumefaciens*

Ans (4)

100. Polysaccharides can be tested by

- (1) Iodine
- (2) HCl
- (3) KCl
- (4) KNO_3

Ans. (1)

101. Which of the following integrates Nervous and endocrine system

- (1) Hypothalamus
- (2) Pineal gland
- (3) Adrenal gland
- (4) Thymus

Ans. (1)

102. Neurotransmitter released by

- (1) Axon terminal
- (2) Dendrite
- (3) Cell body
- (4) Myelin sheath

Ans. (1)

103. Which of the following is correct mode of reproduction

- (1) Budding in Yeast
- (2) Fragmentation in spongilla
- (3) Zoospore in Amoeba
- (4) Binary fission in Hydra

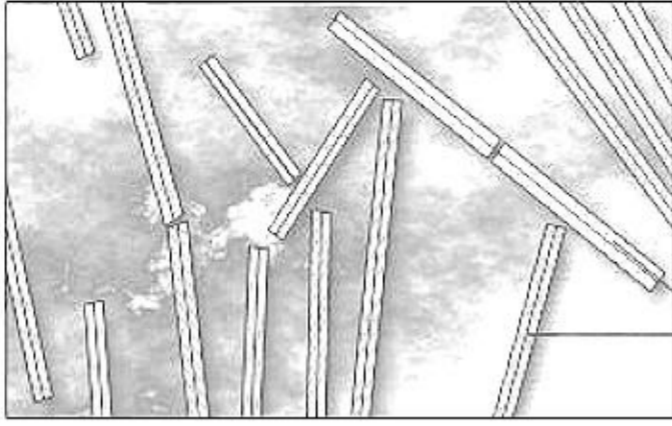
Ans. (1)

104. Characteristics of female cockroach

- (1) Presence of anal style
- (2) Each ovary is made up of '6' ovarioles
- (3) One pair spermatheca present and opens in genital chamber
- (4) Genital pouch is made up of 9th, 10th tergum and 9th sternum

Ans. (3)

105. Identify the diagram



- (1) Bacteria (2) Bacteriophage (3) TMV (4) Adenovirus

Ans. (3)

106. Which of the following are all Nucleotides

- (1) Adenosine, Cytidilic acid, Cytosine (2) Adenylic acid, Cytidilic acid, Guanylic acid
 (3) Cytidine, Adenine, Adenylic acid (4) Uracil, Thymidine, Thymidylic acid

Ans (2)

107. Which cell is found in mucus secreting organs.

- (1) Goblet cells (2) Paneth cells (3) Oxyntic cells (4) Peptic cells

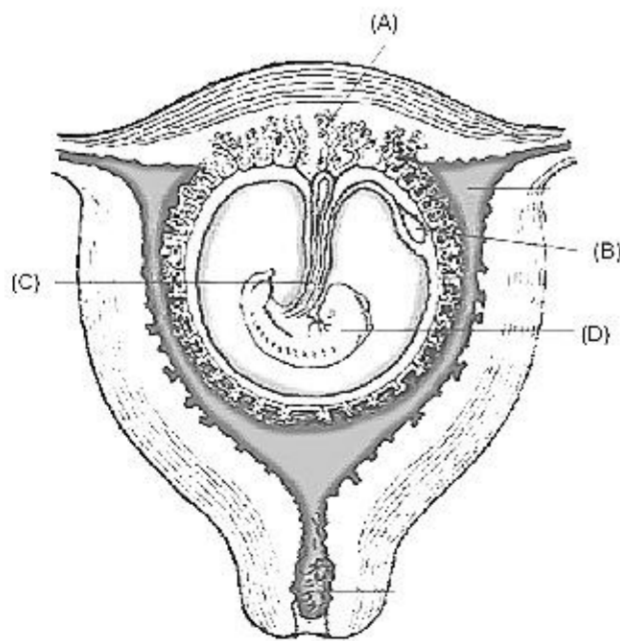
Ans (1)

108. Hairy root disease of dicot plants is caused by-

- (1) *Agrobacterium tumefaciens* (2) *Agrobacterium rhizogene*
 (3) *Bacillum thuriengiensis* (4) *Melodogyne incognita*

Ans (2)

109. Choose the correct one



(1)	A- Chorionic villi	→	forms placenta
(2)	B-Yolk sac	→	Prevents desiccation of embryo
(3)	C- umbilical cord	→	Haemopoiesis
(4)	D- Blastocyst	→	Forms the embryo

Ans (1)

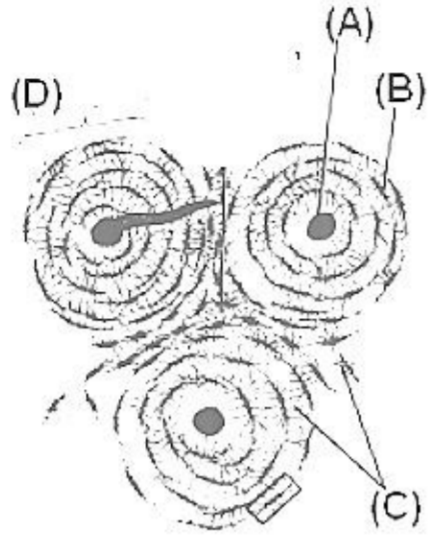
110. Which of the following options have features corresponding to the given animals

Aplysia, Asterias, Antedon, Echinus

- (1) Water vascular system, Calcareous shell (2) Water Canal system, Calcareous shell
(3) Calcareous shell, acoelomate (4) Pseudocoelomate, Water vascular system

Ans (1)

111. Choose the correct option for the labelling in the given diagram (A, B, C, D)



- (1) Haversian canal, lacuna, Lamellae, Haversian system
(2) Haversian canal, Volkmann's canal, Endosteum, Lamellae
(3) Volkmann's canal, Lamellae, Osteocytes, Haversian canal
(4) Haversian canal, Osteocytes, Lamellae, Endosteum

Ans (1)

112. Which statement is incorrect for earthworm

- (1) Two pair of testis present in 10th and 11th segment
(2) One pair of ovaries in attached at the inter-segmental septum of the 12th and 13th segment
(3) It is hermaphrodite
(4) Male genital pore in present in 14th segment

Ans (4)

113. Immunity tolerance developed by

- (1) Interaction with the antigen (2) By giving antibodies
(3) Present by birth (4) By giving antibiotics

Ans (1)

114. **Assertion:** SA node malfunctioning leads to disturbance of Heart rate

Reason: SA node is the pacemaker of heart producing electric impulse for heart contraction

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
(2) If both assertion and reason are true but reason is not the correct explanation of assertion.
(3) If assertion is true but reason is false.
(4) If both assertion and reason are false.

Ans (1)

115. Assertion : There is hyperglycemia in DM type II.

Reason : Insulin injections are essential for treatment.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans (3)

116. Assertion : Cholecystokinin is released by duodenum.

Reason : It activates pepsinogen and bile juice.

- (1) If both assertion and reason are true and reason is the correct explanation of assertion.
- (2) If both assertion and reason are true but reason is not the correct explanation of assertion.
- (3) If assertion is true but reason is false.
- (4) If both assertion and reason are false.

Ans (3)

PART - D (GENERAL KNOWLEDGE) & (APTITUDE & LOGICAL THINKING)

Total Number of Questions (10)

117. Who is the Governor of Reserve Bank of India (RBI)?

Ans. Shaktikanta Das

118. Which agency conducted Anti Satellite missile test recently?

Ans. Defense Research and Development Organisation (DRDO)

119. Find the odd one out with respect to Coastal Line of India.

1. Karnataka 2. Odisha 3. Tamilnadu 4. Andhra Pradesh

Ans. Karnataka

120. R, N, J, ?

Ans. F

121. 3 Fruits Banana, Mango & Orange were available in the ratio 3:4:1. 3 Bananas are removed from the total available fruits & ratio of remaining fruits become 2:4:1. Find the total number of remaining fruits after removing 3 bananas ?

Ans. 21

122. "King of Good Times" is associated with.

Ans. Vijay Mallya

123. Which of the following Van diagram represents relations between Public Transport , Bus , Vehicle

Ans.

124. Akanksha is the Aunt (Chachi) of Saurabh. Chandresh is Saurabh's Father. What is the relation between Akanksha's husband & Chandresh ?

Ans. Brothers

125. The 4 letters in a box have certain relationship then what will replace question mark

G	J
L	H

M	P
R	N

D	I
?	E

Ans. K

126. What was announced regarding the cross checking of Electronic Voting Machine (EVM) with VVPAT during recent General Elections?

Ans. Five percent of VVPATs will be cross checked for each Assembly segment.