R ANSWER KEY & SOLUTION KEY FINAL ROUND - 09 (PCB) Dt.18.04.2024

PHYSICS

SECTION - A (35 Questions)

01. **(4)** The average power in the circuit where $\cos\phi$ = power factory

$$< P >= V_{rms} \times I_{rms} \cos\phi$$

$$V_{rms} = \frac{\frac{1}{\sqrt{2}}}{\sqrt{2}} = \frac{1}{2}\text{volt}; I_{rms} = \frac{\frac{1}{\sqrt{2}}}{\sqrt{2}} = \left(\frac{1}{2}\right)A$$

$$< P >= \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{8}W .$$

02. **(2)** Time gap

$$t_2 - t_1 = \sqrt{(t_1 + t_2)^2 - 4t_1t_2} = \sqrt{\left(\frac{2u}{g}\right)^2 - \frac{8h}{g}}$$

$$\Delta t = \sqrt{16 - 12} = 2\text{second} \cdot$$

03. **(2)** 04. **(3)**

05. **(1)** For $0 < t < 4$s, the position- time graph OA is a straight line inclined at an angle from time axis, which is representing uniform motion of the particle, i.e. the particle is moving with a constant speed. Therefore, acceleration and force acting on the particle will be zero.

Impulse at $t = 0$.

Impulse = change in momentum

$= mv - mu = m(v - u)$

Before $t = 0$, particle is at rest, hence $u = 0$

After $t = 0$, particle is moving with a constant velocity.

Velocity of the particle = slope of position-time graph.

$$= \frac{3m}{4s} = 0.75 ms^{-1}$$

$\therefore$ Impulse = Change in momentum = $4(0.75 - 0)$

$= 3$ kg-ms^{-1}

06. **(3)** For same F, $x \propto \frac{1}{k}$

Hence, $U = \frac{1}{2}kx^2, \Rightarrow U \propto \frac{1}{k}$

$$U_1 : U_2 = \frac{1}{k_1} : \frac{1}{k_2} = \frac{1}{1500} : \frac{1}{3000} = 2:1 .$$

07. **(2)** (i) As the current in XY-plane is anti-clockwise, so moment will be along Z-axis by right hand thumb rule.

$M = iA = 5\pi(0.1)^2 \times 100 = 5\pi$ Am

(ii) $\tau = M \times B$

$$|\tau| = |M||B|\sin\theta = \frac{5 \times \pi \times (0.1)^2 \times 100 \times \sqrt{2}}{\sqrt{2}} = 5\pi \text{ Nm}$$

(Here, $\theta = 45°$)

(iii) Net force on a closed loop carrying current in a uniform magnetic field is zero.

Hence, (i) $\rightarrow (q, r)$, (ii) $\rightarrow (q)$, (iii) $\rightarrow (p)$

08. **(4)** Magnetic field at the centre of primary coil

$$B = \frac{\mu_0 I_1}{2R_1}.$$

Considering it to be uniform, magnetic flux passing through secondary coil is

$$\phi_2 = BA = \frac{\mu_0 I_1}{2R_1} \times (\pi R_2^2)$$

Now, $M = \frac{\phi_2}{I_1} = \frac{\mu_0 \pi R_2^2}{2R_1}$ $\therefore M \propto \frac{R_2^2}{R_1}$.

09. **(2)** Centripetal acceleration $a_c = k^2 rt^2$

Hence $\frac{v_t^2}{r} = k^2 rt^2$ $\left[a_c = \frac{v_t^2}{r}\right]$

$v_t^2 = k^2 r^2 t^2$

$v_t = krt$ ...(i)

$a_t = \frac{dv_t}{dt} = kr$

$F_t = ma_t = mkr$ ...(ii)

& power $P = \vec{F}_t \cdot \vec{v}_t$

$P = (mkr) \cdot (krt)\cos 0^0$

$$P = mk^2r^2t \qquad (\because \vec{F}_t \| \vec{v}_t)$$

10. **(2)** As net external force is zero. Momentum is conserved. Thus , velocity of COM remains constant. Initially COM is at rest. So, COM will remain at rest.

11. **(1)** When a body falls through a viscous medium, finally, it attains terminal velocity. At this velocity, viscous force on rain drop balances the weight of the body.

Hence, the correct answer is option (1).

12. **(2)** According to Newton's law of cooling, rate of cooling is given by

$$\left(\frac{-dT}{dt}\right) = \frac{eA\sigma}{mc}(T^4 - T_0^4)$$

where, c is specific heat of material.

13. **(2)** Between plate $E = \frac{\sigma}{2\varepsilon_0} - \left(\frac{-\sigma}{2\varepsilon_0}\right) = \frac{\sigma}{\varepsilon_0}$,

outside plate $\sigma = 0 \;\; \therefore E = 0.$

14. **(2)** Moment of inertia $(= \Sigma mr^2)$ for a given body depends on the axis of rotation, mass, shape and size of the body as well as on the distribution of mass within the body. Further the larger the distance of constituent particles of a body from the axis of rotation, larger will be its moment of inertia. So moment of inertia does not depend on angular velocity.

15. **(2)** Voltage sensitivity =

$$\frac{\text{Current sensitivity}}{R_g} \Rightarrow R_g = \frac{10}{2} \qquad R_g = 5$$

$$I_g = \frac{100}{10} = 10mA$$

V = voltage to be measured = 100 × 0.5 = 50 V

$$R = \frac{v}{I_g} - R_g = \frac{50}{10\times10^{-3}} - 5$$

$$= 5000 - 5 = 4995\,\Omega.$$

16. **(3)** Speed of light of vacuum $c = \frac{1}{\sqrt{\mu_0\varepsilon_0}}$ and in another medium $V = \frac{1}{\sqrt{\mu\varepsilon}}$

$$\therefore \frac{c}{v} = \sqrt{\frac{\mu\varepsilon}{\mu_0\varepsilon_0}} = \sqrt{\mu_r K} \Rightarrow v = \frac{c}{\sqrt{\mu_r K}}$$

17. **(1)**

18. **(2)** For a nucleus

Volume : $V = \frac{4}{3}\pi R^3$

$$R = R_0(A)^{1/3}$$

$$V = \frac{4}{3}\pi R_0^3 A$$

$$\Rightarrow \frac{V_2}{V_1} = \frac{A_2}{A_1} = 4.$$

19. **(3)**

20. **(2)** Velocity of wave on string

$$V = \sqrt{\frac{T}{\mu}} = \sqrt{\frac{8}{5}\times1000} = 40 \text{ m/s}$$

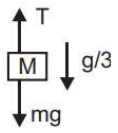
Now, wavelength of wave $\lambda = \frac{v}{n} = \frac{40}{100}m$

Separation b/w successive nodes,

$$\frac{\lambda}{2} = \frac{20}{100}m = 20 \text{ cm}.$$

21. **(3)** $Mg - T = Ma$

$$T = Mg - \frac{Mg}{3}$$



$$T = \frac{2Mg}{3}$$

$$W = \vec{T}\cdot\vec{S} = 2\frac{Mg}{3}\times h(-1) = -\frac{2Mgh}{3}$$

22. **(4)** Here, $I_0 = A^2$, $\theta = 60^0$

From Law of Malus, $I = I_0\cos^2\theta$

$A'^2 = A^2(\cos 60°)^2 = A^2/4$

$A' = A/2.$

23. **(4)** $\Delta L = \frac{WL}{AY} = \frac{\sigma L}{Y}$ $\qquad \frac{\Delta L}{L} = \frac{W}{AY}$

$$\in = \frac{\sigma}{Y}$$

ΔL v/s σ, ΔL v/s W, σ v/s $\in$, all will be linear.

24. **(3)**

25. **(3)** Moment of inertia (I) = mr^2

So $\frac{\Delta l}{l} = \frac{\Delta m}{m} + \frac{2\Delta r}{r}$

$$\% \text{ error} = \frac{\Delta l}{l}\times100\% = \left(\frac{\Delta m}{m} + \frac{2\Delta r}{r}\right)\times100\%$$

$= [1 + (2 \times 2)]\% = 5\ \%.$

26. **(1)** Spacing of fringes, $\beta = \frac{\lambda D}{d}$ = constant. As d is doubled, D must be doubled.

27. **(2)** From the dimensional homogeneity $[x^2] = [B]$

$\therefore [B] = [L^2]$

As well as [U] =

$$\frac{[A][x^{1/2}]}{[x^2]+[B]} \Rightarrow [ML^2T^{-2}] = \frac{[A][L^{1/2}]}{[L^2]}$$

$\therefore [A] = [ML^{7/2}T^{-2}]$

Now $[AB] = [ML^{7/2}T^{-2}] \times [L^2] = [ML^{11/2}T^{-2}]$

28. **(4)** By using $Q = nq \Rightarrow Q = 64q$.

29. **(2)** Force per unit length $= \frac{\mu_0}{4\pi}, \frac{2i_1 i_2}{r} = \frac{\mu_0}{2\pi} \cdot \frac{i^2}{b}$.

30. **(2)** In an inductor voltage leads the current by $\frac{\pi}{2}$

or current lags the voltage by $\frac{\pi}{2}$.

31. **(2)** As ice point on both the scales is 0°.

therefore, $\frac{X-0°}{50-0} = \frac{Y-0°}{150-0}$

$\Rightarrow Y = 3X = 3 \times 15° = 45°$.

32. **(4)** $I_{\text{median line}} = I_A + I_B + I_C + I_D$

$$= 2 \times \frac{Ml^2}{12} + 2M\left(\frac{l}{2}\right)^2 = \frac{Ml^2}{6} + \frac{Ml^2}{2} = \frac{2}{3}Ml^2.$$

33. **(3)**

34. **(2)** Here, $T = \frac{\pi}{2}$ s ; $\upsilon_{max} = 2$m/s ; $x = \frac{r}{2}$; $\upsilon = ?$

$$\upsilon_{max} = r\omega = r\frac{2\pi}{T} \; ; \; 2 = r \times \frac{2\pi}{\pi/2} = 4r \text{ or } r = \frac{1}{2}\text{m}$$

$$\upsilon = \omega\sqrt{r^2 - x^2} = \frac{2\pi}{\pi/2}\sqrt{\left(\frac{1}{2}\right)^2 - \left(\frac{1}{4}\right)^2}$$

$$= 4 \times \frac{\sqrt{3}}{4} = \sqrt{3}\text{m/s}.$$

35. **(1)** de Broglie wavelength, $\lambda = \frac{h}{\sqrt{2mE}}$

Since, E is the same,

hence $\lambda \propto \frac{1}{\sqrt{m}}$

Since $m_{He} > m_p > m_e$

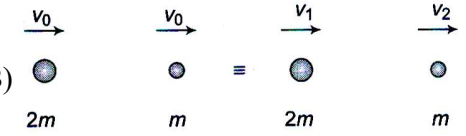
$\therefore \lambda_e > \lambda_p > \lambda_{He}$.

SECTION - B (Attempt Any 10 Questions)

36. **(3)** (A) $mv_0 = mv_1 + 2mv_2 \Rightarrow v_1 + 2v_2 = v_0$ .....(i)

$v_1 + u_1 = v_2 + u_2 \Rightarrow v_1 - v_2 = -v_0$ .....(ii)

Use velocities with sign, i.e. velocities towards right as +ve, velocities towards left as –ve.

(B) 

$2mv_0 - mv_0 = 2mv_1 + mv_2 \Rightarrow 2v_1 + v_2 = v_0$ ....(i)

$v_1 + v_0 = v_2 - v_0 \Rightarrow v_1 - v_2 = -2v_0$ .....(ii).

37. **(1)** When heat Q is supplied at constant volume

$Q = Q_V = \Delta U = nC_V \Delta T$ .....(i)

When heat Q is supplied at constant pressure

$Q = Q_P = \Delta U' + \Delta W = nC_V(\Delta T)' + \Delta W$

$C_V = \frac{1}{n}\frac{Q}{\Delta T}$

$C_P = \frac{1}{n}\frac{Q}{(\Delta T)'}$.

Note : Internal energy of ideal gas Also depend on degree of freedom.

38. **(1)** All the conductors have equal lengths. Area of cross-section of A is $\left\{(\sqrt{3}a)^2 - (\sqrt{2}a)^2\right\} = a^2$

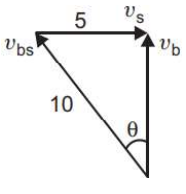
similarly area of cross-section of B = Area of cross-section of C = a^2

Hence according to formula $R = \rho\frac{l}{A}$; resistance of all the conductors are equal i.e. $R_A = R_B = R_C$

39. **(4)** $v_b = \sqrt{10^2 - 5^2}$

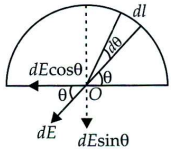
$= 5\sqrt{3}$ km/h

$\theta = \sin^{-1}\left(\frac{5}{10}\right) = 30°$.



40. **(4)** Electric intensity at centre O, due to small element dl of charged ring

$$dE = \frac{\lambda dl}{4\pi\varepsilon_0 a^2} = \frac{\lambda(ad\theta)}{4\pi\varepsilon_0 a^2}$$



As is clear from figure, horizontal components of dE will cancel out in pairs and vertical components will add.

$$\therefore\ E=\int_0^{\pi} dE\sin\theta=\int_0^{\pi}\frac{\lambda}{4\pi\varepsilon_0 a}\sin\theta d\theta=\frac{\lambda}{4\pi\varepsilon_0 a}[-\cos\theta]_0^{\pi}$$

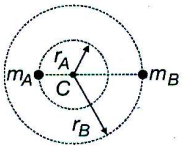
$$E=\frac{\lambda}{4\pi\varepsilon_0 a}(-\cos\pi+\cos 0)=\frac{\lambda}{2\pi\varepsilon_0 a}.$$

41. **(1)**

42. **(4)** $\dfrac{Gm_Am_B}{(r_A+r_B)^2}=m_A\omega_A^2 r_A=m_B\omega_B^2 r_B$

$\because m_Ar_A=m_Br_B$

$\therefore \omega_A=\omega_B$ *or* $T_A=T_B$.



43. **(1)** Time period of stationary pendulum $T=2\pi\sqrt{\dfrac{l}{g}}$

A. In free fall, $a=g$, thus

$$T=2\pi\sqrt{\frac{l}{g-a}}=2\pi\sqrt{\frac{l}{g-g}}=\infty$$

B. In horizontal motion of vehicle with acceleration a

$$T'=2\pi\sqrt{\frac{l}{\sqrt{g^2+a^2}}}\ \ \therefore\frac{T'}{T}=\sqrt{\frac{g}{\sqrt{g^2+a^2}}}$$

C. Lift moving up with acceleration a, then

$$T'=2\pi\sqrt{\frac{l}{g+a}};\ \therefore\frac{T'}{T}=\sqrt{\frac{g}{g+a}}$$

D. Lift moving down with acceleration a, then

$$T'=2\pi\sqrt{\frac{l}{g-a}};\ \therefore\frac{T'}{T}=\sqrt{\frac{g}{g-a}}.$$

44. **(3)** As is known from theory, potential difference between O and A is $V_0-V_A=\dfrac{1}{2}B\omega l^2$, and

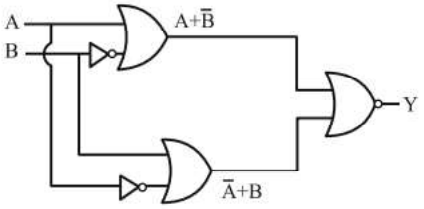
Potential difference between O and B is

$$V_0-V_B=\frac{1}{2}B\omega l^2$$

$$(V_0-V_B)-(V_0-V_A)=\frac{1}{2}B\omega l^2-\frac{1}{2}B\omega l^2$$

or $V_A-V_B=0$.

45. **(3)**



If $A=0;\ \bar{A}=1$

$A=1;\ \bar{A}=0$

$B=0;\ \bar{B}=1$

$B=1;\ \bar{B}=0$

$$Y=\overline{(A+\bar{B})+(\bar{A}+B)}=\overline{(1+1)}=0$$

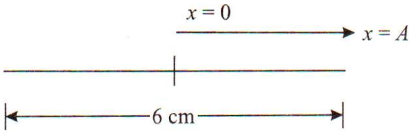
46. **(1)** Resolving the magnetic moments along OP and perpendicular to OP, figure we find that components $\perp$ OP cancel out. Resultant magnetic moment along OP is

$$=\text{M}\cos 45^\circ+\text{M}\cos 45^\circ=2\text{M}\cos 45^\circ=\frac{2M}{\sqrt{2}}=\sqrt{2}M$$

The point P lies on axial line of magnet of moment $=\sqrt{2}M$

$$\therefore\ B=\frac{\mu_0}{4\pi}\frac{2(\sqrt{2}M)}{d^3}.$$

47. **(4)**



$2A=6$ cm

A = 3 cm

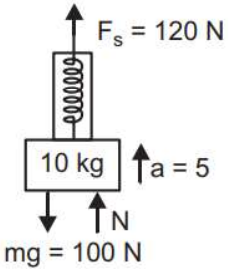
$\omega=2\pi f=2\pi\times 245$ rad/s$=490\pi=1.53\times10^3$

$$K=\frac{\omega}{V}=\frac{1.53\times10^3}{300}\Rightarrow 5.1.$$

48. **(2)**

$$v=\frac{ke^2}{nh},r=\frac{n^2h^2}{mke^2},v=\frac{1}{T}=\frac{v}{2\pi r},E=\frac{me^4}{8\varepsilon_0 n^2h^2}$$

49. **(2)**



$F_S + N - mg = ma$

$120 + N - 100 = 10(5)$

$N = 30$ N.

50. **(2)** $\frac{hc}{\lambda} = hv_o + E$

$\frac{hc}{x} = hv_o + 2E$

$\therefore \quad \frac{hc}{\lambda} - E = hv_o = \frac{hc}{x} - 2E$

Hence, $\therefore \quad x = \frac{hc\lambda}{E\lambda + hc}$.

CHEMISTRY

SECTION - A (35 Questions)

51. **(3)** I, IV
52. **(3)** Oxygen molecule is paramagnetic with two unpaired electrons.
53. **(1)** $H_2O(l) \rightleftharpoons H_2O(g) + Q$

$\Delta H = 40.66$ kJ

$\Delta n_g = 1$

$\Delta E = 37.56$ kJ mol^{-1}

54. **(2)** Given reaction, $2A \rightleftharpoons B + C$

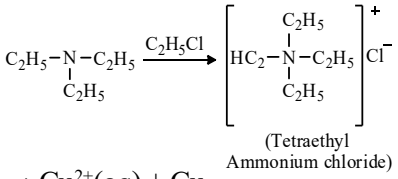
$K_c = \frac{[B][C]}{[A]^2} \qquad K_c = \frac{2\times10^{-3}\times3\times10^{-3}}{(10^{-3})^2} = 6$

55. **(2)** p-Bromophenol
56. **(4)** $\overset{1}{COOH} - \underset{OH}{\overset{2}{CH}} - \overset{3}{CH_2} - OH$

2-amino-3-hydroxy propanoic acid

57. **(1)** Bond order cannot be negative because number of bonding electrons, is always greater than antibonding electrons.
58. **(4)** Although charge density of $Li^{\oplus}$ is maximum, so it is extensively hydrated and its ionic mobility is least and that of $Cs^{\oplus}$ is highest.
59. **(1)** Equilibrium constant is not effected by change in conditions like P and V.
60. **(3)** Lewis concept
61. **(3)** Statement-1 is false, Statement-2 is true
62. **(3)** $C_2H_5Cl \xrightarrow{NH_3} C_2H_5 - NH_2 \xrightarrow{C_2H_5Cl}$

$C_2H_5\text{-}NH\text{-}C_2H_5 \xrightarrow{C_2H_5Cl}$



63. **(1)** $2Cu^+(aq) \rightarrow Cu^{2+}(aq) + Cu$

Hydration energy of Cu^{2+} is higher than that of Cu^+ which compensates second ionisation energy of Cu.

64. **(4)** Terbium is lanthanide as it belongs to 4f-series having configuration $[Xe]4f^96s^2$. However the remaining member belong to 5f-series (actinides)
65. **(4)** OsO_4

Let O.N. of Os be x then $1 \times (x) + 4(-2) = 0$

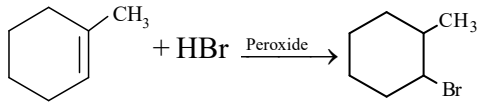
$\therefore \quad x = 8$

66. **(4)**

67. **(3)** In reaction

$2Na(s) + Cl_2(g) \rightarrow Cl_2(g) \rightarrow 2NaCl(s)$ sodium is oxidised by loss of electrons and acts as a reducing agent (donor of electrons).

68. **(1)** He-O_2 mixture is used by deep sea divers in preference to nitrogen-O_2 mixture because helium is much less soluble in blood than nitrogen.
69. **(1)** For an ideal solution $\Delta S_{mix} > 0$
70. **(3)** Solubility increases with decrease in the value of K_H
71. **(4)**



Anti-Markownikoff's addition

72. **(1)** $(eq)_{acid} = (eq)_{KMnO_4}$

$M \times 2 \times 100 = 0.1 \times 5 \times 50$

$M = 0.125$.

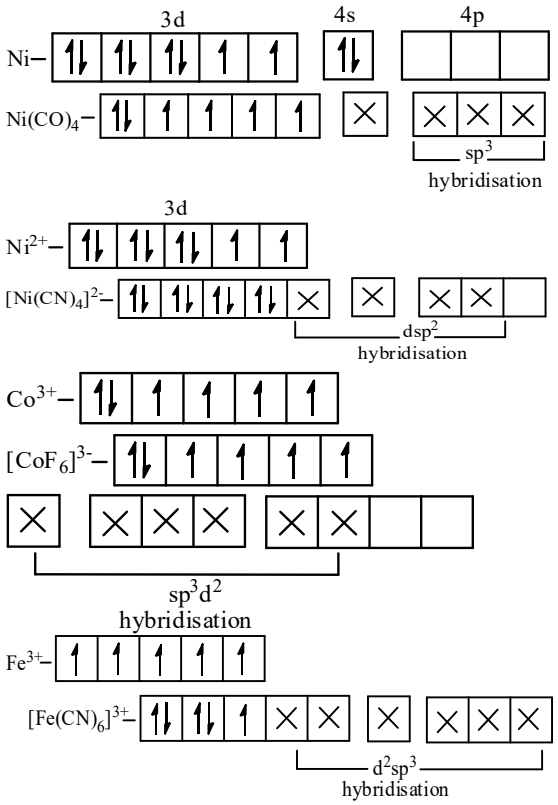
73. **(2)** $HC \equiv CH \xrightarrow[20\%H_2SO_4]{1\%\ HgSO_4} CH_3CHO \xrightarrow[H_2O]{CH_3MgX}$

(a)

$CH_3 - CHOH - CH_3 \xrightarrow{[O]} CH_3COCH_3$

(b)

74. **(4)** $CH_3CH_2CH_2COOCH_3$
75. **(4)** Valence shell electronic configuration of



F^- is a weak field ligand, it cannot cause forcible pairing of electrons within d-subshell and thus forms outer orbital octahedral complexes.

CO and CN^- are strong field ligands, so they can form inner orbital octahedral complexes after forcible pairing of electrons within d subshell.

76. **(1)** Sum of the figures 29.4406, 3.2 and 2.25 is 34.8906. The sum should be reported to the first place of decimal as 3.2 has only one decimal place. After rounding off the sum is 34.9. Hence number of significant figures is three.

77. **(3)** Among all the given options molarity is correct because the term molarity involve volume which increases on increasing temperature.

78. **(2)** 2-methyl but-2-ene and but-2-ene contain 9 alpha H atoms and 6 alpha H atoms respectively. Greater the number of alpha H atoms, greater is delocalisation and greater is the stability.

79. **(1)** a → (p), b → (s), c → (r), d → (q)

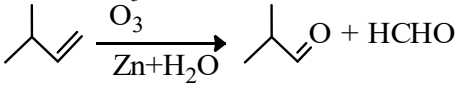
80. **(4)** A-(q); B-(p); C-(s), D-(r)

81. **(4)** A_3N_2

82. **(2)** Nucleons are total number of protons and neutrons. Both of these are collectively known as nucleons.

83. **(1)** Basic definition of quantum numbers

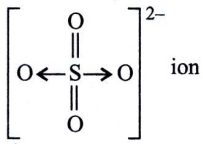
84. **(2)** RMgX gives alkane with acidic hydrogen (Ph—OH, CH_3COOH & HCl)

85. **(3)** 

SECTION - B (Attempt Any 10 Questions)

86. **(2)** If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion

87. **(3)** Ionic bond between Cu^{2+} and SO_4^{2-}, covalent and coordinate in SO_4^{2-};



88. **(3)** For statement (i), T = The other name of Gay-Lussac's law is of definite proportions by volume.

For statement (ii), F = Law of conservation of mass is valid for both physical and chemical change.

For statement (iii), F = Law of definite proportions is valide for each compound individually and not for comparing two different compounds.

For statement (iv), F = Equal volumes of all gases under similar conditions of temperature and pressure contain equal number of molecules.

89. **(3)**Ortho and para - nitrohenol is separated by distillation because p–nitrophenol has higher boiling point than o-nitrophenol due to H-bonding.

90. **(2)** 1 > 2 > 3 > 4

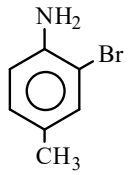
91. **(3)** $ClCH_2COONa + HCl \rightarrow ClCH_2COOH + NaCl$

$\Lambda_{ClCH_2COONa} + \Lambda_{HCl} = \Lambda_{ClCH_2COOH} + \Lambda_{NaCl}$

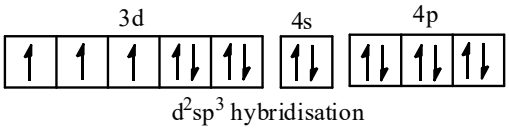
$224 + 203 = \Lambda_{ClCH_2COOH} + 38.2$

$\Lambda_{ClCH_2COOH} = 427 - 38.2$

$= 388.8\ ohm^{-1}\ cm^2\ gm\ eq^{-1}$

92. **(3)** 

93. **(3)** Cr^{3+} having $3d^3$ configuration always have 3 unpaired electrons with strong field as well as weak ligands.



$[Cr(NH_3)_4BrCl]^+ =$

So, $\mu_{BM} = \sqrt{3(3+2)} = \sqrt{15} = 3.83$

94. **(1)** Given $V.P_P = 80$ torr

$V.P_Q = 60$ torr

$P_{total} = V.P_P \times x_p + V.P_q \times x_q$

$$= \left[80 \times \frac{3}{5} + 60 \times \frac{2}{5}\right] = 16 \times 3 + 12 \times 2$$

$P_{total} = 48 + 24 = 72$ torr

95. **(1)** $a \rightarrow (s), b \rightarrow (t), c \rightarrow (p), d \rightarrow (q)$
96. **(2)** Borax, B_2O_3 and borax bead test
97. **(2)** Strongest oxidising agent = $Ag^+/Ag(s)$
Weakest oxidising agent = $Mg^{2+}/Mg(s)$
98. **(2)** Equimolar mixture of D-glucose and D-galactose
99. **(1)** It is potassium ammine dicyano dioxo peroxo-chromate (VI).
100. **(1)** $\Delta G^o = \Delta H^o - T\Delta S^o$

For a spontaneous reaction $\Delta G^o < 0$

$$\text{or } \Delta H^o - T\Delta S^o < 0 \Rightarrow T > \frac{\Delta H^o}{\Delta S^o}$$

$$\Rightarrow T > \frac{179.3 \times 10^3}{160.2} > 1117.9K \approx 1118K$$

BOTANY

Section - A (35 Questions)

101. **(1)** [NCERT class XI, page no. 244 (First paragraph) + NCERT Exemplar, question no. 03 (Very short answer type questions)]
102. **(1)** (NCERT XI Pg.227, 2nd Para, 13th line)
103. **(4)** (NCERT 11th, Paragraph 8.4.1, Concept based Page No. 128)
104. **(3)** (NCERT XII, Pg 83, Para 4, Based on last 4 line 9 Chromosome map)
105. **(2)** (NCERT XII, Pg 77, based on Table 5.2)
106. **(1)** (NCERT XII, Based on Mutation)
107. **(2)** (NCERT XII, Pg 117, Para 2, Line 1,2,3)
108. **(1)** [NCERT XI; Page No. 79 & 80; Sub-topic 5.9.1 & 5.9.2; Newly added family]
109. **(3)** (NCERT 11th, Paragraph 10.4.1, Page No. 169)
110. **(3)** (NCERT XIIth Pg 109, Para 1, Line 7,8,9,10)
111. **(1)** (NCERT XII, Pg 121, Para 3, Line 5)
112. **(3)** (NCERT XII, Pg 110, last line)
113. **(4)** (NCERT 11th, Paragraph 8.4.2, Page No. 129)
114. **(4)** (NCERT 11th, Page no-24, Paragraph no-1, Line no-1 and 2)

(NCERT 11th, Page no-24, Paragraph no-3, Line no-31 and 32)

115. **(4)** [NCERT class XI, Page no. 92 (Figure 6.7) 93 (Point 6.3.1)]
116. **(3)** [NCERT class XI, Page no. 89, Line no. 12-14]
117. **(3)** (NCERT 12th, Page no- 39, 1st Paragraph, Concept based intext question)
118. **(2)** (NCERT 12th, Page no-31, 2nd Paragraph, Line no- 34,35,36)
119. **(1)** (NCERT 12th, Page no- 29, 2nd paragraph, 33,34,35,36)
120. **(4)** (NCERT 11th, Paragraph 8.5.9, Concept based, Page No. 137)
121. **(1)** (NCERT XI page no. 208, 4th paragraph)
122. **(3)** (NCERT 11th, Page no-22-*Sporozoans*)
123. **(3)** (11th NCERT PK Page no.27 table3.1)
124. **(4)** (11Th NCERT PK Conceptual)
125. **(3)** (NCERT XII, Pg 90, based on Figure 5.15)
126. **(3)** (NCERT XI-page no. 208, 2nd paragraph)
127. **(2)** (NCERT 11th, Page no-10, Paragraph- 2, Line no-14)
128. **(3)** (NCERT 11th, Page no-19, Paragraph-3, Line no-20, 21)
129. **(2)** (NCERT XI Pg.237, 2nd line)
130. **(2)** (Page no.35 3rd para just above liverworts)
131. **(1)** (12th NCERT Page no.249, fig.14.4(d))
132. **(2)** [NCERT XI; Page No. 73; Sub-topic 5.5]
133. **(3)** [NCERT XI; Page No. 71; Sub-topic 5.3.4]
134. **(1)** (NCERT 11th, Paragraph 10.1.1, Page 163)
135. **(4)** [NCERT class XI, Page 249, Point 15.4.3.3 (First paragraph)]

SECTION - B (Attempt Any 10 Questions)

136. **(4)** (NCERT 11th, Page no-23, Paragraph no-3, Line no-27 and 28)

(NCERT 11th, Page no-24, Paragraph no-1, Line no-1 and 2)

137. **(3)** (NCERT 11th, Page no- 8, 2nd paragraph, Line no- 17 and 18)
138. **(4)** (NCERT XII, Pg 89, Based on sex linkage (Colour Blidness)
139. **(2)** (NCERT XII, Pg 85, 5.5 PLEIOTROPY)
140. **(2)** (NCERT 12th, Page no-35, Paragraph no-last, Line no-40 and 41)
141. **(2)** (NCERT XII, Pg 80, based on Law of Independent Assortment and product law of probability)

142. **(1)** [NCERT XI, Page 248, point 15.4.3.1 (Last paragraph, conceptual)]
143. **(2)** (NCERT 11th, Paragraph 8.5.1, Page No. 131)
144. **(3)** (NCERT XI Pg.235, 14.6 2nd Para, Last line)
145. **(4)** (NCERT 11th, Paragraph 10.2.5, Page No. 166)
146. **(1)** (NCERT XI page no. 214, 3rd paragraph and page no. 215 1st paragraph)
147. **(3)** (11th NCERT PK Page no.31 to 33 conceptual)
148. **(4)** (NCERT XII, Pg 116, Para 1, 2, Pg 115, Para 4, Pg 114, Para 3,4, Pg 122, para 1)
149. **(2)** [NCERT XI; Newly added family]
150. **(3)** (XIIth NCERT Page No. 248)

ZOOLOGY

Section - A (35 Questions)

151. **(2)** (NCERT Pg. No. 271 - Mechanism of respiration)
152. **(3)** (NCERT Pg. No. 152 - Vaccination)
153. **(3)** (NCERT11th, Page No.111; Paragraph 3, line 1st)
154. **(2)** (NCERT12th, Page No. 57; Paragraph 1)
155. **(2)** (NCERT12th, Page No. 61; Fig. 4.3)
156. **(2)** (NCERT 12th, Page no-137, Paragraph no-2, Line no-19 to 22)
157. **(2)** (NCERT 11th, Page no- 148, Sub chapter 9.5, Line no- 6,7,8)
158. **(1)** (NCERT 11th, Page no- 144, Last paragraph, Line no- 3 and 4)
159. **(1)** (NCERT XI Page No. 57; Class - Amphibia)
160. **(1)** (NCERT XI Page No. 336; 1st paragraph)
161. **(2)** (NCERT XI Page No. 298; 2nd line of last paragraph)
162. **(4)** (NCERT XI NCERT Conceptual)
163. **(2)** (NCERT 12th, Page no-137, Paragraph-2, Line no-19)
164. **(2)** (12th NCERT Page no.236)
165. **(4)** (NCERT XI Page No. 296; 5th line)
166. **(4)** [NCERT P.No.312 Disorders]
167. **(1)** [NCERT P.No.310 Fig.20.7]
168. **(3)** [NCERT P.No.211,Gene Therapy 2nd para]
169. **(3)** [NCERT P.No.209, last para]
170. **(2)** (NCERT Pg. No.152 Immunity section)
171. **(4)** [NCERT P.No.127, 2nd Point]
172. **(4)** [NCERT P.No.321 From Line 18 Onwords]
173. **(2)** [NCERT P.No.201, Last para]
174. **(2)** (NCERT Page No - 153 Immune system)
175. **(2)** (NCERT Pg. No.156-157)
176. **(4)** (12th NCERT Page no. 234 to 235, Conceptual)
177. **(3)** [NCERT P.No.315 second para and p316 first & second Para]
178. **(2)** (NCERT12th, Page No. 59; Paragraph 3, line 1st)
179. **(3)** (NCERT12th, Page No.54; Paragraph 3, line 7)
180. **(3)** (NCERT12th, Page No. 64, Paragraph 2, line 7)
181. **(2)** (NCERT 12th, Paragraph 10.2.2, Page No. 182)
182. **(3)** (NCERT 12th, Page no-129, Paragraph no-1, Line no-9,10,11)
183. **(3)** (12Th NCERT Page no.232 to 235 conceptual)
184. **(3)** (NCERT 12th, Paragraph 10.2.3, Page No. 183)
185. **(2)** (NCERT Pg. No. 284 - Cardiar cycle)

SECTION - B (Attempt Any 10 Questions)

186. **(4)** (NCERT Pg. No. 284 - Conducting system)
187. **(1)** (NCERT Pg. No. 196)
188. **(1)** [NCERT P.No.312 Synovial Joints]
189. **(2)** [NCERT P.No.321, Midbrain para 3rd Line]
190. **(3)** (NCERT XIIth Page No. 197, First para)
191. **(4)** (12th NCERT Page no.266 to 267)
192. **(2)** (NCERT11th, Animal tissue)
193. **(2)** (NCERT12th, Page No. 45; Paragraph 1, line 2)
194. **(2)** (NCERT12th, Page No.43; Paragraph 1, line 10)
195. **(3)** (NCERT Pg. No. 270 - Mechanism of respiration)
196. **(1)** (NCERT 12th, Page no-134, Paragraph-2, Line no- 33 to 39 and Page no-135, Paragraph-2)
197. **(3)** (NCERT XI Page No. 298, 3rd line of 2nd paragraph)
198. **(1)**(NCERT XI Page No. 56; class chondrichthyes)
199. **(4)** (NCERT 11th, Page no- 152, 1st paragraph, Line no- 1 ,2)
200. **(2)** Competitive inhibition of enzyme is responsible for the synthesis of cholesterol.