S ANSWER KEY & SOLUTION KEY FINAL ROUND - 05 (PCB) Dt.09.04.2024

PHYSICS

SECTION - A (35 Questions)

01. **(3)** Density of mixture

$$= \frac{\text{mass of mixture}}{\text{volume of mixture}} = \frac{m_1 + m_2 + ... + m_n}{\frac{m_1}{\rho_1} + \frac{m_2}{\rho_2} + ... + \frac{m_n}{\rho_n}}$$

$$\frac{\sum_{i=1}^{n} m_i}{\sum_{i=1}^{n} \frac{m_i}{\rho_i}}$$

Hence, the correct answer is option (3)

02. **(1)** If M is mass of rod of length L, its moment of inertia about an axis passing through its centre and perpendicular to length of the rod is

$$I = \frac{ML^2}{12}$$

$$\Delta I = \frac{1}{12} M(2L\Delta L)$$

$$\frac{\Delta I}{I} = \frac{2\Delta L}{L}$$

As $\Delta L = L\alpha\Delta t \quad \therefore \frac{\Delta I}{I} = \frac{2L\alpha\Delta t}{L} = 2\alpha\Delta t.$

03. **(1)**

04. **(1)** $\Delta(W_{cycle}) = (2P - P)(3V - V) = 2PV$

Cycle is anticlockwise on P-V diagram. Hence, work done is –ve. $\Rightarrow$ heat rejected.

$$\Delta Q_{cycle} = \Delta W_{cycle} = 2PV$$

Heat rejected in cycle ABCD = $2PV$.

05. **(3)** The field due to infinite linear charge distribution

$\Rightarrow E \propto \frac{1}{r}$ So hyperbola.

06. **(3)** From energy conservation, $mgh \geq \frac{1}{2}mv^2$ at lowest point ($v_{min} = \sqrt{5gr}$ to complete vertical circular motion)

$$h \geq \frac{(\sqrt{5gr})^2}{2g} \Rightarrow h \geq \frac{5r}{2}$$

07. **(4)** $F_{avg} = \frac{\Delta p}{\Delta t} = \frac{0.12 \times 25}{0.1} = 30$

08. **(4)** Relative velocity of the scooter with respect to the bus $(v_s - 10)$

$$\therefore \frac{1000}{(v_s - 10)} = 100s \Rightarrow v_s = 20 \text{ ms}^{-1}$$

09. **(1)** Magnetic field inside the conductor, $B_{in} \propto r$

and magnetic field outside the conductor, $B_{out} \propto \frac{1}{r}$

(where r is the distance of observation point from axis)

Aliter : The magnetic field at a point outside the straight conductor is given by $B = \frac{\mu_0 i}{2\pi r}$

The magnetic field at a point inside the conductor is

$$B = \frac{\mu_0 i \times r}{2\pi a^2}$$

Magnetic field inside the conductor $B_{in} \propto r$ and magnetic field outside the conductor $B_{out} \propto \frac{1}{r}$

(where r is the distance of observation point from axis)

10. **(4)** If the origin of the coordinate system is at the centre of mass then $\vec{R}_{CM} = 0$, which in turn implies that

$$\sum_i m_i\vec{r}_i = 0 \text{ as } R_{CM} = \frac{\sum_i m_i\vec{r}_i}{\sum_i m_i},$$

($m_i\vec{r}_i = 0$ represents the moment of a mass about the origin or the centre of mass.)

11. **(3)** Here, $e=-8V, \frac{dI}{dt}=\frac{4-2}{0.05}=40\text{A/s}, L=?$

As $-e=L\frac{dI}{dt}, L=\frac{-e}{dI/dt}=\frac{8}{40}=0.2H.$

12. **(3)** [X] = [Force] – [Density] = $[MLT^{-2}]\times[ML^{-3}]=[M^2L^{-2}T^{-2}]$

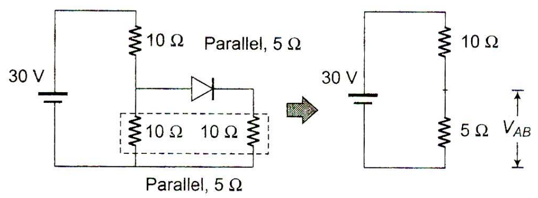
13. **(4)** $I=\frac{V}{X_C}=230\times600\times100\times10^{-12}=13.8\mu A$

14. **(2)** Since, de Broglie wavelength $\lambda=\frac{h}{mv}$

Velocity of electron in Bohr orbit is $v\propto\frac{1}{n}$.

15. **(4)**

16. **(1)** Diode is in forward bias



$V_{AB}=\frac{5}{5+10}\times30=10\text{ V}$

17. **(3)** $M=1+\frac{D}{f}$

$6=1+\frac{25}{f}\Rightarrow5=\frac{25}{f}\Rightarrow f=5\text{ cm}$

18. **(1)** Since, $T^2=kr^3$

Differentiating the above equation

$\Rightarrow2\frac{\Delta T}{T}=3\frac{\Delta r}{r}\Rightarrow\therefore\frac{\Delta T}{T}=\frac{3}{2}\frac{\Delta r}{r}.$

19. **(1)** As medium changes, optical path changes.

Also, $\frac{\Delta x}{\lambda}=\frac{\Delta\phi}{2\pi}$

Hence phase difference changes.

20. **(4)** $\sin\theta=\frac{m\lambda}{a}$

when a increases, θ decreases,

width decreases so intensity will increases.

21. **(4)** Power in primary of transformer is

$P_P=V_p.I_P=220\times0.5=110$ W

But power in secondary of transformer is

Ps = 100 W

$\therefore\ \eta=\frac{100}{110}=0.9=90\%$

22. **(4)** $\sqrt{\frac{3RT}{2}}=\sqrt{\frac{3R(320)}{32}}$

$T=\frac{320}{16}=20K.$

23. **(2)** Area under a-t graph = change in velocity

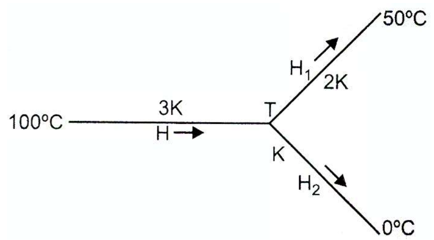
$\frac{1}{2}\times8\times10=v-0$ or $v=40$ m/s

24. **(4)** The last two resistances are out of circuit. Now $8\,\Omega$ is in parallel with $(1+1+4+1)\,\Omega$

$\therefore\ R=8\Omega\,||\,8\Omega=\frac{8}{2}=4\Omega; R_{AB}=4+2+2=8\Omega$

25. **(2)** Transition from higher states to n = 2 lead to emission of radiation with wavelengths 656.3 nm and 365.0 nm. These wavelengths fall in the visible region and constitute the Balmer series.

26. **(1)**



Rate of flow of heat,

$H=H_1+H_2$

$\frac{3K(100-T)A}{l}=\frac{2K(T-50)A}{l}+\frac{K(T-0)A}{l}$

$3(T-100)=2(50-T)+(0-T)$

$3T-300=100-2T-T$

$6T=400$

$T=\frac{400}{6}=\frac{200}{3}\,^\circ C$

27. **(3)** $\phi=\vec{E}\cdot\vec{A}=\left(3\hat{i}+10\hat{j}-2\hat{k}\right)\cdot\left(60\hat{i}\right)$

$=180$

28. **(4)** From $t=0$ to $t=\frac{T}{2}$, $\frac{dI}{dt}$ = positive constant

$e=-L\frac{dI}{dt}$ is negative constant

From $t=\frac{T}{2}$ to $t=T$, $\frac{dI}{dt}$ = negative constant

$\therefore e=-L\frac{dI}{dt}$ is positive constant.

29. **(1)**

30. **(2)** W.D. = $\frac{m}{4}g\cdot\frac{l}{8}=\frac{mgl}{32}$

31. **(1)** $\frac{I}{A}=j$ and $j=\frac{E}{\rho}$

$\therefore j_A > j_B$ and $E_A > E_B$.

32. **(3)** As stress is shown on x-axis and strain on y-axis, so we can say that

$$Y = \cot\theta = \frac{1}{\tan\theta} = \frac{1}{slope}$$

So elasticity of wire P is minimum and of wire R is maximum.

33. **(4)** Retarding torque is constant. Therefore , angular retardation, say, α will also be constant. Applying,

$$\omega^2 = \omega_0^2 - 2\alpha\theta$$

we get,

$$\left(\frac{\omega_0}{2}\right)^2 = \omega_0^2 - 2\alpha\theta_1 \quad ...(i)$$

and $0 = \left(\frac{\omega_0}{2}\right)^2 - 2\alpha\theta_2 \quad ...(ii)$

Solving Eqs. (i) and (ii), we get

$$\theta_2 = \frac{\theta_1}{3}$$

Therefore, the disc will make $\frac{n}{3}$ more rotations before coming to rest.

34. **(4)** The S.I. relation is $B = \mu_0(H + M)$

35. **(3)** We know that, $\vec{L} = I\vec{\omega}$

$$\therefore \frac{dL}{dt} = I\frac{d\vec{\omega}}{dt} = I\vec{\alpha} \Rightarrow \frac{d\vec{L}}{dt} = \vec{\tau} \ (\because \ \vec{\tau} = I\vec{\alpha})$$

If $\vec{\tau} = 0$, then $\frac{d\vec{L}}{dt} = 0$ i.e., $\vec{L} =$ constant vector

SECTION - B (Attempt Any 10 Questions)

36. **(3)** 1st SHM, $y_1 = 8\sin(2\pi t + \pi/2)$;

amplitude $a_1 = 8$ unit

2nd SHM, $y_2 = 2\sin(2\pi t) + 2\sqrt{3}\cos(2\pi t)$

So amplitude $= \sqrt{2^2 + (2\sqrt{3})^2} = 4$

$\therefore$ Amplitude, $a_2 = 4$ unit $\quad \frac{a_1}{a_2} = \frac{8}{4} = \frac{2}{1}$.

37. **(2)** Given, $\upsilon\frac{d\upsilon}{dx} = -\omega^2 x$

Integrating it, within the limits of motion, we have

$$\int_{\upsilon_0}^{\upsilon} \upsilon \, d\upsilon = \int_0^x -\omega^2 x \, dx$$

or $\left(\frac{\upsilon^2}{2}\right)_{\upsilon_0}^{\upsilon} = -\omega^2\left(\frac{x^2}{2}\right)_0^x$

or $\upsilon^2 - \upsilon_0^2 = -\omega^2 x^2$ or $\upsilon = \sqrt{\upsilon_0^2 - \omega^2 x^2}$.

38. **(2)** $y_2 = a_2\cos\left(\omega t - \frac{2\pi x}{\lambda} + \phi\right)$

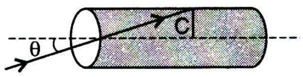
$$= a_2\sin\left[\frac{\pi}{2} + \left(\omega t - \frac{2\pi x}{\lambda} + \phi\right)\right]$$

compare it with $y_2 = a_1\sin\left(\omega t - \frac{2\pi x}{\lambda}\right)$

Phase diff. $= \left(\frac{\pi}{2} + \phi\right)$

$\therefore$ Path diff. $= \frac{\lambda}{2\pi}\left(\frac{\pi}{2} + \phi\right)$

39. **(4)** $\sin C = \frac{\sqrt{3}}{2}$ ....(i)



$$\sin r = \sin(90° - C) = \cos C = \frac{1}{2}$$

$$\frac{\sin\theta}{\sin r} = \frac{\mu_2}{\mu_1}$$

$$\Rightarrow \sin\theta = \frac{2}{\sqrt{3}} \times \frac{1}{2}$$

$$\Rightarrow \theta = \sin^{-1}\frac{1}{\sqrt{3}}.$$

40. **(1)** $\frac{dy}{dx} = \tan\theta = \frac{x}{2} = \mu = \frac{1}{2}$

$$x = 1, y = \frac{1}{4}$$

41. **(1)** For first diagram, $Y = \overline{\overline{A} \cdot B}$

A	B	$\overline{A}$	$\overline{B}$	$\overline{A}\cdot\overline{B}$	$(\overline{\overline{A}\cdot\overline{B}})$
0	0	1	1	1	0
0	1	1	0	0	1
1	0	0	1	0	1
1	1	0	0	0	1

42. **(2)** Correct diameter of the ball
= MSR + CSR × (Least count) – Zero error
= 0.5 cm + 25× 0.001 – (–0.004)
= 0.5 + 0.025 + 0.004 = 0.529 cm.

43. **(4)** Lets say radius of small droplets is r and that of big drop is R

$$\frac{4}{3}\pi R^3 = 1000\frac{4}{3}\pi r^3 \Rightarrow \text{R} = 10\text{r}$$

$$U_i = 1000(4\pi r^2 S)$$

$$U_f = 4\pi R^2 S \quad \Rightarrow \quad = 100(4\pi r^2 S)$$

$$U_f = \frac{1}{10}U_i$$

44. (2) $u = \epsilon_0 (E_{rms})^2 = \frac{1}{2}\epsilon_0 E_0^2$

$$= \frac{1}{2}(8.85\times10^{-12})(100)^2$$

$= 4.425 \times 10^{-8}$ J m^{-3}

45. **(3)** the particles will not collide if

$$d > 2(r_1 + r_2)$$

or $d > 2\left(\frac{mv_1}{Bq} + \frac{mv_2}{Bq}\right)$

or $d > \frac{2m}{Bq}(v_1 + v_2)$

46. **(1)** For emission, the wave number of the radiation is given as

$$\frac{1}{\lambda} = Rz^2\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

R = Rydberg constant, Z = atomic number

$$= R\left(\frac{1}{1^2} - \frac{1}{5^2}\right) = R\left(1 - \frac{1}{25}\right) \Rightarrow \frac{1}{\lambda} = R\frac{24}{25}$$

linear momentum

$$P = \frac{h}{\lambda} = h \times R \times \frac{24}{25} \text{ (de-Broglie hypothesis)}$$

$$\Rightarrow mv = \frac{24hR}{25} \Rightarrow v = \frac{24hR}{25m}.$$

47. **(3)** The speed of sound (v) in air by resonance tube method is given by,

$$v = 2f(l_2 - l_1)$$

$$v = 2 \times 480 \times (70 - 30) \times 10^{-2}$$

$$v = 38400 \times 10^{-2} m/s \Rightarrow v = 384 \text{ m/s}$$

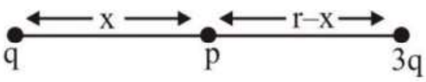
48. **(4)** $\Delta\lambda = \lambda_{K_\alpha} - \lambda_{\min.}$

When V is halved, $\lambda_{\min.}$ becomes two times but λ_{K_α} remains the same

$$\therefore \Delta\lambda' = \lambda_{K_\alpha} - 2\lambda_{\min.} = 2(\Delta\lambda) - \lambda_{K_\alpha}$$

$$\therefore \Delta\lambda' < 2(\Delta\lambda).$$

49. **(3)**

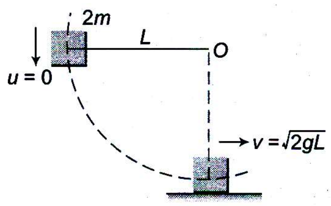


$$\left(\vec{E}_{\text{net}}\right)_P = 0$$

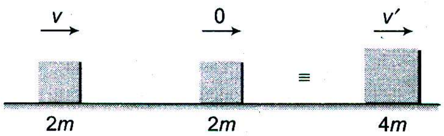
$$\frac{kq}{x^2} = \frac{k\cdot 3q}{(r-x)^2} \Rightarrow (r-x)^2 = 3x^2$$

$$r - x = \sqrt{3}x \Rightarrow x = \frac{r}{\sqrt{3}+1}$$

50. **(2)**

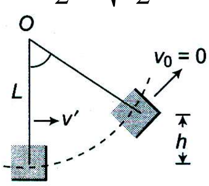


$$v^2 = 2gL \Rightarrow v = \sqrt{2gL}$$



$$2mv = (2m + 2m)v'$$

$$v' = \frac{v}{2} = \sqrt{\frac{gL}{2}} < \sqrt{2gL}$$



$$0 = v'^2 - 2gh \Rightarrow \frac{gL}{2} = 2gh$$

$$h = \frac{L}{4} = \frac{5}{4} = 1.25 \text{ m.}$$

CHEMISTRY

SECTION - A (35 Questions)

51. **(4)** $pK_w = pH + pOH$
As $[H^+] = [OH^-]$
$\therefore$ $pK_w = 2 \times pH$
$\therefore$ $pH = 13.26/2 = 6.63$

52. **(4)** $Li = 1s^2\, 2s^1$, $Be = 1s^2, 2s^2$, $B = 1s^2, 2s^2, 2p^1$. $C = 1s^2, 2s^2\, 2p^2$.
Be is highly stable due to filled s-orbitals, therefore $Be^{\ominus}$ is highly unstable.

53. **(3)** If assertion is true but reason is false

54. **(2)** Ketones does not react with tollen's reagent

55. **(4)** Stability $\rightarrow$ Aromatic > non aromatic > antiaromatic

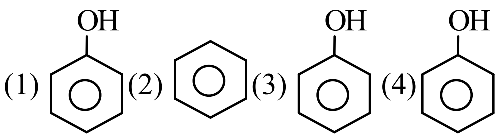
56. **(1)** (A), (B), (C)

57. **(3)** Colloidal solution in which the dispersed phase has very little affinity for the dispersion phase are termed as lyophobic. Lyophobic sols are less stable. On evaporation of solvent, the residue cannot be easily transformed back into colloidal state by ordinary means. therefore, they are also called as irreversible colloids.

58. **(4)** $Fe^{+3} = d^5 = t_{2g}^3 e_g^2$, CFSE = 0.

59. **(3)** Fe is present in the form of complex ion, i.e., $[Fe(CN)_6]^{3-}$ which does not et ionised to give Fe^{3+} and CN^-.

60. **(2)** Benzene is formed in second reaction.



61. **(4)** (1)-(iii); (2)-(iv); (3)-(ii); (4)-(i)

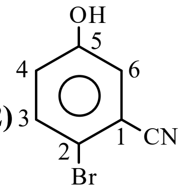
62. **(2)** $q + w = \Delta U$
$V = \text{constant} \Rightarrow w = -pdv = 0$
$\Rightarrow q = \Delta U$

63. **(2)** Not expected to absorb visible light unpaired electron is zero.
i.e., $[Ni(CN)_4]^{-2}$

64. **(2)** Moving phase is liquid and stationary phase is liquid

65. **(3)** Rate of reaction can increase with concentration of reactant in the case of positive order and the same can decrease in the case of negative order.

66. **(2)**



Cyano group has the highest priority therefore, parent name must be benzonitrile. Br occurs at 2-position, and hydroxyl at 3-position, hence the IUPAC name is 2-bromo-5-hydroxy benzonitrile.

67. **(4)** We know that lanthanides La, Gd shows +3, oxidation state, while Eu shows oxidation state of +2 and +3. Am shows + 3, +4, +5 and +6 oxidation states, Therefore Americium (Am) has maximum number of oxidation states.

68. **(2)** $\pi = iCRT$ $\quad C = \frac{N}{n}$

$(i)_{KCl} = 2C_{kCl} = 1$

$(i)_{K_2SO_4} = 3 \qquad C_{K_2SO_4} = \frac{1}{2}$

$(i)_{K_3PO_4} = 4 \qquad C_{K_3PO_4} = \frac{1}{3}$

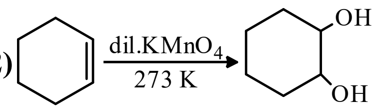
$\pi \propto iC$

$\pi_{KCl} : \pi_{K_2so_4} : \pi_{K_3PO_4}$

$= 2 : \frac{3}{2} : \frac{4}{3}$

$= 12 : 9 : 8$

69. **(2)**



70. **(3)** In H_5IO_6 OS of I is +7 i.e. in it's maximum us hence can only undergo reduction.

71. **(4)** All are correct

72. **(1)** Both the statements (I) and (II) are true

73. **(1)** 1 mL of CS_2 weighs 2.63 g.
10 mL of CS_2 will weigh 26.3 g.

$$\underset{\substack{12+(2\times 32)\\76\text{ g}}}{CS_2} + 3O_2 \rightarrow \underbrace{\underset{22.4\text{ L}}{CO_2} + \underset{44.8\text{ L}}{2SO_2}}_{67.2\text{ L}}$$

$\therefore$ 76 g of CS_2 will yield 67.2 L of a mixture of CO_2 and SO_2 and SO_2 at STP.
$\therefore$ 26.3 g of CS_2 would yield

$$\frac{67.2}{76} \times 26.3 = 23.25 \text{ L}.$$

74. **(4)** $\underset{2mol}{2X}+\underset{\underset{LR}{2mol}}{3Y}\longrightarrow 3Z$

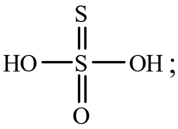
Y is limiting reagent and hence will get completely consumed.

$\Rightarrow$ Theoretical yield = 2 moles

Actual yield = 1.75 moles

$$\%\text{ yield}=\frac{(\text{yield})_{act}}{(\text{yield})_{th}}=\times 100$$

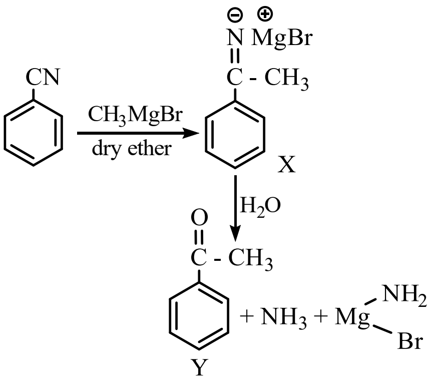
$$=\frac{1.75}{2}\times 100=87.5\ \%$$

75. **(3)** 

; $H_2S_2O_3$, two sulphur atoms are in –2 and +6 oxidation state.

76. **(4)** ClF_3 is used for preparation of UF_6 in the enrichement of $^{235}_{92}U$.

77. **(2)** Second Reaction is not possible due to partial double bond character between benzene and bromine.

78. **(2)** 

79. **(3)** Overall reaction ;

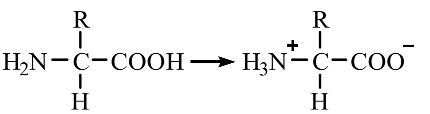
$$2H_2(g)+O_2(g)\longrightarrow 2H_2O(l)$$

(Hydrogen -Oxygen fuel cell)

80. **(1)** $\Rightarrow$ no. of O atoms = 10 moles = 10 g atoms

81. **(1)** Conceptual fact.

82. **(2)** $\overset{\oplus}{N}H_4>NH_3>\overset{\ominus}{N}H_2$

83. **(2)** 

Amino acid — A zwitterion form

A zwitter ion is formed by transfer of a proton from a –COOH groups to an $-NH_2$ group.

84. **(3)** Cannizzaro reaction takes place in basic medium

85. **(1)** Those compound which accept H^+ are called bronsted base, here NO_3^- accept H^+ and forms HNO_3. So it is a bronsted base.

SECTION - B (Attempt Any 10 Questions)

86. **(2)** $CH_3CHOHCH_2CH_3\xrightarrow{\text{Oxidation}}CH_3COCH_2CH_3\xrightarrow{NH_2OH}\text{oxime}$

↓ Gives positive haloform

87. **(2)** $kt=2.303\log\frac{Ro}{Rt}$

$$\Rightarrow\frac{1.15\times 10^{-5}\times 3600}{2.303}=\log\frac{Ro}{Rt}$$

$$\Rightarrow\log\frac{R_o}{R_T}=0.018$$

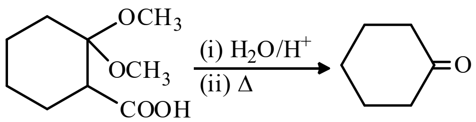
$$\frac{R_o}{R_T}=1.042$$

$$\frac{R_T}{R_o}=0.9596$$

Percentage of remaining reactant $=\frac{R_T}{R_o}\times 100$

= 95.96 %

88. **(4)** A-(iv); B-(i); C-(ii), D-(iii)

89. **(4)** 

90. **(2)** $\alpha=\frac{\Lambda_m}{\Lambda_m^o}=\frac{7.8}{390}=0.02$

$$(K_a)_{CH_3COOH}=\frac{c\alpha.c\alpha}{c-c\alpha}$$

$$=\frac{c\alpha^2}{1-\alpha}=\frac{0.04\times(0.02)^2}{1-0.02}\approx 1.6\times 10^{-5}$$

Use: $pK_a+pK_b=pK_w=14$

$\Rightarrow pK_b=14-pK_a=14-4.8=9.2$

91. **(3)** All Al-Cl (terminal) bonds are shorter than all Al-Cl (bridged) bonds

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

93. **(1)** $[N_2]$ and $[H_2]$ start from non-zero value, decrease & then become constant.

$[NH_3]$ start from zero, increase & then become constant.

94. **(4)** The overlap of a lone pair on the C atom with the empty hybrid metal orbital forms a metal-to-carbon σ-bond. The transition metal atom in a

metal carbonyl has filled non-bonding d-orbitals which are of proper symmetry to overlap with the anti-bonding orbitals of CO. The electronic charge is transferred from the filled non-bonding orbitals of the metal to π^* orbitals of the ligand CO. This reduces the bond order of CO. The π back bonding strengthens the M–C bond order, it weakens the C–O bond order.

95. **(1)** This reaction follows S_N1 mechanism
96. **(2)** Spontaneity of reaction depends on tendency to acquire minimum energy state and maximum randomness. For a spontaneous process in an isolated system the total change in entropy is positive.
97. **(1)** SO_2 readily decolourises pink violet colour of acidified $KMnO_4$ solution.

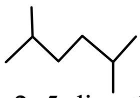
$$\underset{\text{(Pinkviolet)}}{2KMnO_4} + 5SO_2 + 2H_2O \longrightarrow K_2SO_4 + \underset{\text{(Colourless)}}{2MnSO_4} + 2H_2SO_4$$

98. **(1)** A and B
99. **(2)** It is Mn^{2+} having five unpaired electrons so its magnetic moment is:

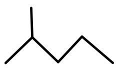
$$\mu = \sqrt{5(5+2)} = 5.9\,\text{B.M.}$$

100. **(3)**

Butane



2, 5-dimethyl hexane



isohexane

BOTANY

Section - A (35 Questions)

101. **(4)** (NCERT XII, Pg 112, Para 2)
102. **(1)** (NCERT XII, Pg 75, 5.2.1 Law of Dominance, 5.2.2 Law of Segregation)
103. **(1)** (11th Para 8.5.5, 8.5.6, 8.5.3.3 Page no.135, 136,137,134)
104. **(3)** (11th Para 10.2.2, Page no.165)
105. **(4)** (NCERT XI added family)
106. **(4)** (NCERT XII, Page 119, Para 2, Line 6)
107. **(4)** (NCERT XII, Page 103, Para 2, Point (iii))
108. **(1)** (11^{th} NCERT Page no.32)
109. **(3)** (11^{th} NCERT PK, Page no.36,3.2.2)
110. **(4)** (11^{th} NCERT Page no.35 conceptual)
111. **(2)** (12^{th} NCERT Page no.247 2^{nd} para)
112. **(2)** (NCERT XI Pg. No. 210, 212, 13.6.1, 213, 2^{nd} paragraph)
113. **(2)** (NCERT 12^{th}, Page no-22, last paragraph, Line no-1)
(NCERT 12^{th}, Page no-23, last paragraph, Line no-1and 2)
(NCERT 12^{th}, Page no-24, first paragraph, Line no-1, 2 and 3)
114. **(2)** (NCERT XI Pg.235, 1^{st} Para, 2^{nd} line)
115. **(4)** [NCERT XI, Page 240, Point 15.1]
116. **(2)** [NCERT XI, Page 250, Point 15.4.3.5]
117. **(4)** [NCERT XI, 249 (Point- 15.4.3.3), 248 (Point 15.4.3.1 First paragraph) and Page 247 (Point 15.4.1)]
118. **(4)** (NCERT 12^{th}, Page no-28, last paragraph, Line no-5-10)
119. **(2)** (NCERT 11^{th}, Page no-23, 1^{st} paragraph, Line no-6,7,8)
120. **(1)** (NCERT Page no- 21, Paragraph- 2.2.4)
121. **(2** [NCERT class XI, Page no. 02 and Class XII, Page no. 02]
122. **(2)** (NCERT XI Page No. 72; Sub-topic 5.5; Page No. 79 Sub-topic 5.9.1 & added family Poaceae)
123. **(3)** (NCERT XI Page No. 78; Sub-topic 5.8)
124. **(1)** (NCERT XII, Pg 106, Para 5, Line 7)
125. **(2)** (NCERT XII, Pg 97, based on DNA structure)
126. **(3)** (11th Para 10.2.2, 10.2.3, Page no.165,166)
127. **(2)** (NCERT XI Pg.233, 2^{nd} Para, 1^{st} line & 3^{st} line)
128. **(1)** (NCERT XII, Genetics Terminology)
129. **(1)** (NCERT XII, Pg 87,Para 1, Line 1)
130. **(1)** (NCERT XII, Pg 86,Para 1, Line 19)
131. **(2)** (11th Para 8.5.9 based conceptual /Page no.138)
132. **(4)** (NCERT XI Pg. No. 220, 13.9, 3^{rd} paragraph)
133. **(3)**(NCERT 11^{th}, Page no-10, paragraph-1.3.4, Line no-9,10)
134. **(2)** (NCERT 12^{th}, Page no-28, 1^{st} and 2^{nd} paragraph, Line no-3,4, 24,25)
135. **(4)** (11th Para 8.5.6, Page no.136)

SECTION - B (Attempt Any 10 Questions)

136. **(4)** [NCERT class XI, Page no. 92 (Line no. 08-09), 93 (First paragraph)]
137. **(3)** (NCERT XI Page No. 75; Sub-topic 5.5.1.4)

138. **(3)** (12th NCERT Page no.242 ,14.1)
139. **(2)** (NCERT 12th, Page no-26, first paragraph, Line no-5,6,7)
140. **(4)** (NCERT 11th, Page no-26, 1st paragraph, Line no-9,10)
141. **(2)** (NCERT 11th, Page no-21, Paragraph-2.2.3, Line no-16,17,18)
142. **(3)** (11th NCERT Page no.33,1st para) (11th NCERT PK. Page no.23 to 24)
143. **(4)** (NCERT 11th, Page no-6, Last paragraph, Line no-31-34)
144. **(1)** (NCERT XI Page No. 217, fig. 13.8)
145. **(1)** (11th Para 8.5.5, Page no.135, 136)
146. **(4)** (NCERT XI Pg.235, 14.6, 2nd Para, 9st line)
147. **(1)** (11th Para 10.2.2, 10.2.3, Page no.165,166)
148. **(3)** (NCERT XII, Pg 102, based on Hershey-Chase experiment)
149. **(3)** (NCERT XII, Pg 106, Para 2, Line 3)
150. **(4)** (NCERT XII, Pg 71, Based on Monohybrid cross)

ZOOLOGY

Section - A (35 Questions)

151. **(1)** (NCERT 11th, Page no-150, 1st paragraph, Figure-9.3c)
152. **(2)** (NCERT XI Page No. 57, Class-amphibia)
153. **(2)** [NCERT P.No.211, gene therapy, 2nd para 4rd Line]
154. **(4)** (NCERT XI Page No. 53, phylum arthropoda)
155. **(2)** (NCERT XI Page No. 298, 3rd paragraph, 3rd line)
156. **(2)** (Page No. 159 Cannabinoids)
157. **(1)** (NCERT 12th, Page no-131, 2nd paragraph, Line no-27-29)
158. **(3)** (NCERT 12th, Page no-137, 2nd paragraph, Line no-19, conceptual)
159. **(4)** (NCERT 12th, Page no-137, paragraph-3, Line no-6 to 8)
160. **(4)** (12th NCERT Page no.230 1st para)
161. **(4)** (NCERT 12th, p.no 42, para1)
162. **(3)** (NCERT 12th, p.no 54, para3,4)
163. **(1)** [NCERT P.No.310 12th Line]
164. **(3)** NCERT P. No.321 Forebrain Last 4 lines]
165. **(3)** (NCERT XI Page No. 294, 2nd line of 2nd paragraph)
166. **(3)** (NCERT XI Page No. 336, 6th line of 3rd paragraph)
167. **(2)** (NCERT 11th, p.no 119, para1, line13)
168. **(3)** (NCERT Pg. No. 268 Respiratory organ)
169. **(1)** (NCERT Pg. No. 284 Cardiac cycle)
170. **(2)** (Page No. 153- Immune System)
171. **(4)** (12th NCERT Page no.261,15.1.2)
172. **(4)** (12th NCERT Page no.267, 2nd para)
173. **(4)** (NCERT 11th, Page no-146, paragraph- 9.3, Line no-10-13)
174. **(2)** (NCERT 11th, Page no-146, Table- 9.3)
175. **(2)** (NCERT 11th, p.no 103, para2)
176. **(2)** (NCERT 12th, p.no 61,62)
177. **(1)** [NCERT P.No.312 Synovial Joints 5th Line]
178. **(2)** [NCERT P.No.310 Last Para]
179. **(4)** (NCERT 12th, p.no 63, STD)
180. **(2)** (12th Para 10.5, Page no.185,186.)
181. **(3)** [NCERT P. No.317 First para Last 4 Lines]
182. **(4)** [NCERT P.No.198, Gel Electrophoresis]
183. **(3)** (NCERT Pg No. 158- Treatement of Cancer)
184. **(2)**(NCERT Pg. 158-159)
185. **(2)** (NCERT 12th, p.no 64, para1)

SECTION - B (Attempt Any 10 Questions)

186. **(2)** (12th NCERT Page no.233 to 234)
187. **(1)** (NCERT 12th, Page no-129, paragraph-7.9, Line no-19, conceptual)
188. **(4)** (NCERT 11th, Page no-144, 2nd paragraph, Line no-16,17)
189. **(1)** (NCERT XI Page No. 55 and 56 class chondrichthyes)
190. **(3)** (NCERT XI Page No. 333, 16th line of 1st paragraph)
191. **(1)** (NCERT 11th, p.no 114, para2, line2)
192. **(3)** [NCERT P.No.306 2nd para last Line]
193. **(3)** (NCERT 12th, p.no 48, para3, line3)
194. **(4)** [NCERT P.No.200, Point 5, 14th Line]
195. **(2)** [NCERT P.No.209, 8th and 9th Line]
196. **(2)** [NCERT P. No.321 7th and 15th Line]
197. **(3)** (12th Para 10.6, Page no.188)
198. **(1)** (NCERT Pg. No.269 Human Respiratory system)
199. **(4)** (Page No. 145 Introduction)
200. **(2)** (NCERT Pg. No.286 - Double circulation)