R ANSWER KEY & SOLUTION KEY FINAL ROUND - 17 (PCB) Dt.27.04.2024

PHYSICS

SECTION - A (35 Questions)

01. **(1)** Current flowing through the conductor.

$$\frac{4}{1}=\frac{nev_{d_1}\pi(1)^2}{nev_{d_2}\pi(2)^2} \text{ or } \frac{v_{d_1}}{v_{d_2}}=\frac{4\times4}{1}=\frac{16}{1}$$

02. **(1)** According to Stefan's law

$E=\sigma T^4$

Heat radiated per unit area in 1 hour (3600s) is

$= 5\times10^{-8}\times(3000)^4\times3600 = 1.5\times10^{10}$]

03. **(4)** Total charge $Q_1+Q_2=Q'_1+Q'_2$

$= 12\mu C - 3\mu C = 9\mu C$

Two isolated conducting spheres S_1 and S_2 are two connected by a conducting wire.

$$\therefore V_1=V_2=\frac{KQ'_1}{2/3R}=\frac{KQ'_2}{R/3}=12-3=9\mu C$$

$$Q'_1=2Q'_2 \Rightarrow 2Q'_2+Q'_2=9\mu C$$

$$\therefore Q'_1=6\mu C \text{ and } Q'_2=3\mu C$$

04. **(1)** When hot water temperature (T) and surrounding temperature (T_0) readings are noted, and log ($T-T_0$) is plotted versus time, we get a straight line having a negative slope; as a proof of newton's law of cooling.

$$\frac{dT}{dt}=-K\Delta T$$

$$\int_{\Delta T_{initial}}^{\Delta T_{final}}\frac{dT}{\Delta T}=-K\int_0^t dt \Rightarrow \ln\left[\frac{T-T_0}{T_i-T_0}\right]=-Kt$$

$$\Rightarrow \ln(T-T_0)=\ln(T_i-T_0)-kt$$

So on comparing $y=-mx+c$

So option (1) is correct.

05. **(1)** Mass of section BC m/L (L – y).

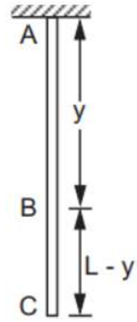
$\therefore$ tension at B = T = m/L (L – y) g.

$\therefore$ elongation of element dy at B

$$=dx=(dy)\frac{T}{AY}=\frac{m}{L}(L-y)g\frac{dy}{AY}$$

Total elongation =

$$\int dx=\frac{mg}{LAY}\int_0^L(L-Y)dy=\frac{mgL}{2YA}$$



06. **(3)** $\vec{M}$ (mag×moment / volume)$=\frac{NiA}{A\ell}$

$$=\frac{Ni}{\ell}=\frac{(500)15}{25\times10^{-2}}=30000\ Am^{-1}$$

07. **(2)** Majority carries in an n-type semiconductor are electrons.

08. **(4)** $F+f=ma$ ...(i)

$$FR-fR=\frac{mR^2}{2}\frac{a}{R} \quad \text{...(ii)}$$

From equation (i) and (ii)

$$2F=\frac{3ma}{2} \text{ or } a=\frac{4F}{3m}$$

$$F+f=\frac{m4F}{3m}$$

$$F=\frac{4}{3}F-F=\frac{F}{3}$$

09. **(4)** Translational KE $=\frac{1}{2}mv^2$

Rotational KE =

$$\frac{1}{2}I\omega^2=\frac{1}{2}mR^2\omega^2\left(\because \text{ For a ring, } I=mR^2\right)$$

$$\therefore K_R=\frac{1}{2}m(\omega R)^2=\frac{1}{2}mv^2$$

So translational KE = rotational KE

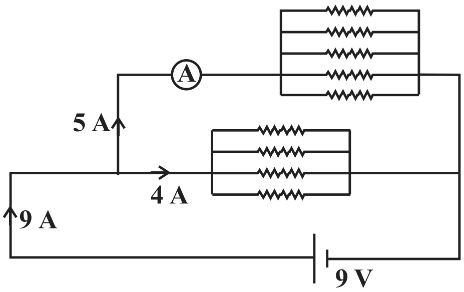
$\therefore \frac{K_T}{K_R} = 1:1$

10. **(4)** n = n to n = 1, number of transition = $\frac{n(n-1)}{2} = 10$

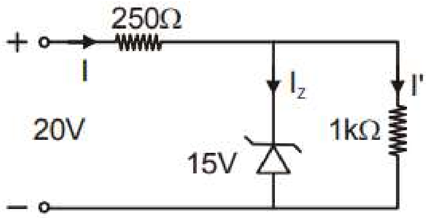
$n^2 - n = 20$

$n = 5$

11. **(2)**



12. **(1)**



The voltage drop across 1 kΩ = V_Z = 15V

The current through 1 kΩ is :

$I' = \frac{15V}{1\times10^3\Omega} = 15\times10^{-3}A = 15mA$

The voltage drop across 250 Ω = 20 V – 15 V = 5V

The current through 250 Ω is

$I = \frac{5V}{250\Omega} = 0.02A = 20mA$

The current through the Zener diode is :

$I_Z = I - I' = (20-15)mA = 5mA$

13. **(1)** Let pressure outside be P_0

$\therefore P_1(\text{ in smaller bubble}) = P_0 + \frac{2T}{r}$

$P_2(\text{ in bigger bubble}) = P_0 + \frac{2T}{R} (R > r)$

$\therefore P_1 > P_2$

Hence air moves from smaller bubble to bigger bubble.

14. **(1)** $G = 15\Omega, i_g = 4mA, i = 6A$

Required shunt,

$S = \left(\frac{i_g}{i-i_g}\right)G = \left(\frac{4\times10^{-3}}{6-4\times10^{-3}}\right)\times15$

$\frac{4\times10^{-3}}{5.996}\times15 = 10m\Omega$ (in parallel)

15. **(1)** Kirchoff's loop rule follows from conservation of energy.

16. **(1)** $\frac{\Delta A}{A} = 2\frac{\Delta r}{r}$ [As A = $4\pi r^2$]

$\frac{\Delta V}{V} = 3\frac{\Delta r}{r}$

$\therefore \frac{\Delta V}{V} = \frac{3}{2}\frac{\Delta A}{A} \Rightarrow \frac{\Delta V}{V} = \frac{3}{2}\alpha$

17. **(3)** $\phi = at + b, \phi + \Delta\phi = a(t+\Delta t) + b$. Subtraction gives $\Delta\phi = a\Delta t$

Average induced emf = $(\Delta\phi/\Delta t) = a$. The average induced current is a/R

18. **(4)** $n_1\beta_1 = n_2\beta_2$

$n_1\left(\frac{D\lambda_1}{d}\right) = n_2\left(\frac{D\lambda_2}{d}\right)$

$n_2 = n_1\left(\frac{\lambda_1}{\lambda_2}\right) \Rightarrow 62\times\frac{5893}{4358} \approx 84$

19. **(3)** $(KE)_{max} = E - \phi$

= 1.8 – 1.2

= 0.6 eV

i.e., $eV_0 = (KE)_{max}$ $= eV_0 = 0.6$ eV

∴ Stopping potential $V_0 = 0.6$ V

20. **(1)** A is false and B is true

21. **(1)** Conceptual

22. **(2)** By Gauss Law, flux is only by inside charges.

23. **(1)** Ideal ammeter has zero resistance

24. **(4)** $U = U_1 + U_2$

$= n_1 C_{v1}T + n_2 C_{v2}T$

$= 3\times\frac{5}{2}RT + 5\times\frac{3}{2}R\times T$

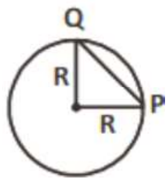
= 15 RT

25. **(4)** Diffraction effect can be observed in both sound as well as light waves

26. **(3)** Magnitude of average velocity is

$|\vec{v}_{av}| = \left|\frac{\text{displacement}}{\text{time}}\right|$

$= \frac{PQ}{t} = \frac{\sqrt{2}R}{t}$



Here t can be found from

$\theta = \frac{1}{2}\alpha t^2$ or $t = \sqrt{\frac{2\theta}{\alpha}}$, where $\theta = \frac{\pi}{2}$

$$= \sqrt{\frac{2 \times \frac{\pi}{2}}{\pi / 4}} = 2s \quad \therefore$$

$$|\vec{v}_{av}| = \frac{\sqrt{2}R}{t} = \frac{\sqrt{2}\cdot\sqrt{2}}{2} = 1 \text{ m/s}$$

27. **(2)** $E = Rhe\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$

E will be maximum for the transition for which $\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$ is

Maximum. Here n_2 is the higher energy level.

Clearly, $\left[\frac{1}{n_1^2} - \frac{1}{n_2^2}\right]$ is maximum for the third transition,

i.e. $2 \to 1$. I transition represents the absorption of energy.

28. **(2)** Induced electric field is non conservative in nature and of circular in shape.

29. **(3)** $\frac{d}{dv}(VP^n) = 0$

$$vnP^{n-1}\frac{dP}{dv} + P^n = 0$$

$$nvP^{n-1}\frac{dP}{dv} = -P^n \quad \frac{dp}{dv} = \frac{-p^n}{nVp^{n-1}} = \frac{-p}{nV}$$

$$\text{Bulk modulus} = \frac{dp}{-dV/V} = -V\frac{dP}{dv} = \frac{P}{n}$$

30. **(3)** Volume of first substance, $V_1 = 1/2$

Volume of second substance, $V_2 = 4/3$

$$\therefore \text{ Relative density} = \frac{1+4}{(1/2)+(4/3)} = \frac{30}{11} = 2.73$$

31. **(3)** $B_1 = \frac{\mu_0 I}{2R}, B_2 = \frac{2\mu_0 I}{2R}$

$$B_R = \sqrt{B_1^2 + B_2^2} = \frac{\mu_0}{2R}\sqrt{I^2 + (2I)^2}$$

$$\frac{\mu_0}{2R} \times \sqrt{5}I = \frac{\sqrt{5}\mu_0 I}{2R}$$

32. **(1)** Given, $\vec{v} = (3\hat{i} + 5\hat{j})$ m/s

$\vec{B} = (6\hat{i} + 4\hat{j})T$

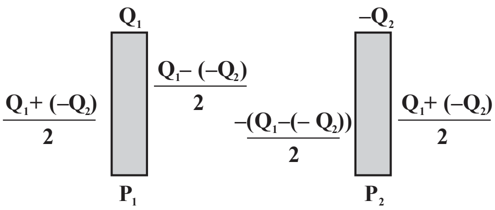
Magnetic force, $\vec{F} = q(\vec{v} \times \vec{B})$

$= -e[(3\hat{i} + 5\hat{j}) \times (6\hat{i} + 4\hat{j})]$

$= -e[(-30\hat{k} + 12\hat{k})] = 18\,e\hat{k}N$

Thus, force is along positive Z-axis.

33. **(1)** We know in case of parallel plates the charges distributed as shown in the figure.



34. **(4)** According to Faraday's law of electro-magnetic induction Induced emf, $e = \frac{Ldi}{dt}$

$$50 = L\left(\frac{5-2}{0.1 \text{ sec}}\right)$$

$$\Rightarrow L = \frac{50 \times 0.1}{3} = \frac{5}{3} = 1.67 \text{ H}$$

35. **(3)** Work function of aluminium is 4.2 eV. The energy of two photons can not be added at the moment photons collide with electron all its energy will be dissipated or wasted as this energy is not sufficient to knock it out. Hence emission of electron is not possible.

SECTION - B (Attempt Any 10 Questions)

36. **(1)** Given T/2 = 0.5 s

$\therefore$ T = 1 s

Frequency, $f = \frac{1}{T} = \frac{1}{1} = 1Hz$

If A is the amplitude, then

2A = 50 cm $\Rightarrow$ A = 25 cm

37. **(3)** Both statement I and II are correct

38. **(2)** $\frac{S_{4th}}{S_{3rd}} = \frac{u + \frac{1}{2}g(2t_1 - 1)}{u + \frac{1}{2}g(2t_2 - 1)}$

$$= \frac{20 + \frac{1}{2} \times 10(2 \times 4 - 1)}{20 + \frac{1}{2} \times 10(2 \times 3 - 1)}$$

$$= \frac{20 + 5(7)}{20 + 5(5)} = \frac{20 + 35}{20 + 25} = \frac{55}{45} \Rightarrow \frac{S_{3rd}}{S_{2nd}} = \frac{11}{9}$$

39. **(1)** $\frac{GmM}{R^n}=\frac{mv^2}{R}\Rightarrow\sqrt{\frac{M}{R^{n-1}}}=V$

$T=\frac{2\pi R}{v}=\frac{2\pi R}{\sqrt{GM}}R^{\left(\frac{n-1}{2}\right)}\Rightarrow T\propto R^{\frac{n+1}{2}}$

40. **(4)** For 16 g of helium, $n_1=\frac{16}{4}=4$

For 16 g of oxygen, $n_2=\frac{16}{32}=\frac{1}{2}$

For mixture of gases,

$C_V=\frac{n_1C_{V_1}+n_2C_{V_2}}{n_1+n_2}$ where $C_V=\frac{f}{2}R$

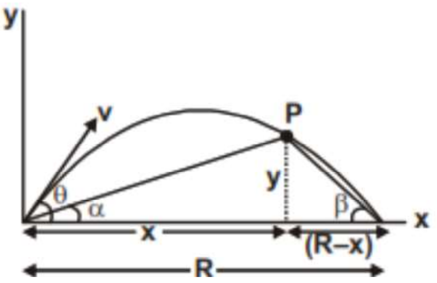
$C_P=\frac{n_1C_{P_1}+n_2C_{P_2}}{n_1+n_2}$ where $C_P=\left(\frac{f}{2}+1\right)R$

For helium, $f=3$, $n_1=4$

For oxygen, $f=5$, $n_2=1/2$

$\therefore\ \frac{C_P}{C_V}=\frac{\left(4\times\frac{5}{2}R\right)+\left(\frac{1}{2}\times\frac{7}{2}R\right)}{\left(4\times\frac{3}{2}R\right)+\left(\frac{1}{2}\times\frac{5}{2}R\right)}=\frac{47}{29}=1.62$

41. **(2)**



We know that $y=x\tan\theta\left(1-\frac{x}{R}\right)$

Now, from figure

$\tan\alpha+\tan\beta=\frac{x\tan\theta\left(1-\frac{x}{R}\right)}{x}+\frac{x\tan\theta\left(1-\frac{x}{R}\right)}{(R-x)}$

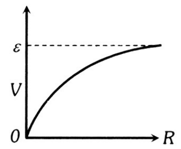
On solving $\tan\alpha+\tan\beta=\tan\theta$

42. **(1)** Conceptual

43. **(3)** $i=\frac{\varepsilon}{r+R}$

$v=iR=\frac{\varepsilon R}{r+R}\Rightarrow v=\frac{\varepsilon}{1+\frac{r}{R}}$

here, r = constant



44. **(2)** Heat given by water,

$Q_1=ms\Delta T=200\times1\times(25-10)=3000$ cal

Heat absorbed by m gm of ice at –14°C to convert into water at 10°C is :

$Q_2=(ms\Delta T)_{\text{ice}}+mL_{\text{ice}}+(ms\Delta T)_{\text{water}}$

$=m(0.5\times14+80+1\times10]=97m$

Hence, 97 m = 3000 or m = 31 gm.

45. **(1)** $d\sin\theta=n\lambda$

for 3rd maxima $n=3$

$\therefore\ \sin\theta=\frac{n\lambda}{d}=\frac{3\times589\times10^{-9}}{0.589}$

or $\theta=\sin^{-1}\left(3\times10^{-6}\right)$

46. **(1)** $\frac{A_1}{A_2}=\frac{\sqrt{\beta}}{1}$,

$\frac{a_{\max}}{a_{\min}}=\frac{A_1+A_2}{A_1-A_2}$

47. **(1)** When interfering sources have same frequency and their phase difference remains constant with time, interference is sustained (stayed for a finite time interval).
If amplitudes are of nearby values then contrast will be more pronounced.

48. **(3)** $Z=\sqrt{R^2+\left(2\pi fL-\frac{1}{2\pi fC}\right)^2}$

From above equation at $f=0\Rightarrow z=\infty$

When $f=\frac{1}{2\pi\sqrt{LC}}$ (resonate frequency)

$\Rightarrow Z=R$

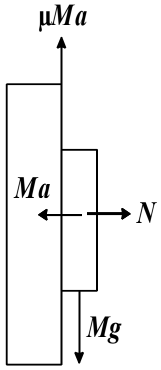
For $f>\frac{1}{2\pi\sqrt{LC}}\Rightarrow Z$ starts increasing.

i.e., for frequency $0-f_r$ *Z decreases*
and for f_r to ∞, Z increases. This is justified by graph (3)

49. **(4)**

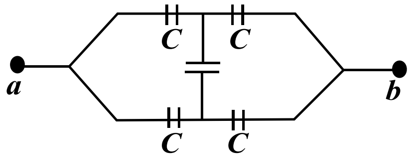
Force of friction will balance the weight.

So $\mu Ma \geq Mg$; $\mu = \frac{g}{a}$



50. **(1)** The equivalent circuit is shown in figure

Thus, $C_{ab} = C = \frac{\varepsilon_0 A}{d}$



CHEMISTRY

SECTION - A (35 Questions)

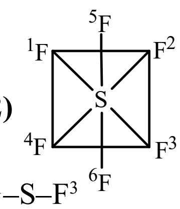
51. **(2)** The ligands with small value of Δ_0 are called weak field ligands whereas those with large value of Δ_0 are called strong field ligands, hence CN^- causes more splitting than H_2O and NH_3.
52. **(1)** In F_2O, fluorine is more electronegative than oxygen and hence given oxidation number of –1.
53. **(1)** Conceptual
54. **(4)** $K_2Cr_2O_7$, $KMnO_4$ and K_2CrO_4 are coloured due to charge transfer.
55. **(1)** $MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$
$Fe(C_2O_4) \rightarrow Fe^{2+} + C_2O_4^{2-}$
$Fe^{2+} \rightarrow Fe^{3+} + e^-$, $C_2O_4^{2-} \rightarrow 2CO_2 + 2e^-$
We can see that one mole of $KMnO_4$ accepts 5 electrons, whereas one mole of $Fe(C_2O_4)$ loses 3 electrons.
$\therefore$ Number of moles of $KMnO_4$ required to oxidise one mole of $Fe(C_2O_4) = 3/5 = 0.6$ mole.
56. **(1)** Conceptual
57. **(1)** Lanthanoids are 14 elements in the VIth period (atomic number = 58 to 71) that are filling the 4f-sublevel.
58. **(1)** Molality, $m = \frac{w_B}{m_B} \times \frac{1000}{w_A}$

$$b = \frac{c}{m_B} \times \frac{1000}{(a-c)} ; \; m_B = \frac{c}{b} \times \frac{1000}{(a-c)}$$

59. **(4)** Rate of Reaction α stability of carbocation.
60. **(2)** Assertion is true but Reason is false. The correct form of Reason is :
In NH_3, bond angle reduces to 107.5° due to repulsion between lone pair on N and bond pairs between N and H.
61. **(3)** The given figure is showing positive deviation from Raoult's law.

$P_A > P_A^o X_A$

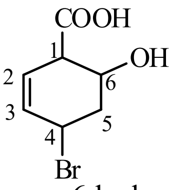
Thus A–B attractive force should be weaker than A–A and B–B attractive forces.
62. **(2)** $CH_3CHO + RMgX \xrightarrow{H_2O} CH_3\text{–}CH(OH)\text{–}R$
63. **(4)** Acetate
64. **(3)** The overall reaction of Daniell cell is
$Zn(s) + Cu^{2+}(aq) \longrightarrow Cu(s) + Zn^{2+}(aq)$
So, its cell representation will be as follows :
$Zn(s)\,|\,Zn^{2+}(aq)\,||\,Cu^{2+}(aq)\,|\,Cu(s)$
65. **(3)** Conceptual
66. **(2)** Mechanism of reaction as well as relative concentration of reactants decides that how many concentration terms affect the rate of reaction i.e., order of reaction.
67. **(2)** O_2^{2-}
68. **(1)** Catalyst catalyse both forward and backward reaction by same extent, without changing ΔG and K_c.
69. **(2)** 'A' is $CH \equiv CH$; 'B' is CH_3CHO; 'C' is $CH_3\text{–}CH_3$; 'D' is CH_3COOH
$CH \equiv CH \xrightarrow[\text{Ni}/150\text{–}300^o]{H_2} CH_3\text{–}CH_3$
$CH_3\text{–}CHO \xrightarrow[H^+]{[Ag(NH_3)2]^+} CH_3COOH$
70. **(4)** Both Assertion and Reason are true and Reason is the correct explanation of Assertion
NaCl dissociates in water and organic acids dimerises in benzene.
71. **(2)** A = B = pricric acid
72. **(1)** Hydrated size of ion $\propto$ Charge density of ion $\rightarrow H^+$
73. **(3)** (I)-(C), (II)-(D), (III)-(A), (IV)-(B)
74. **(1)** 4
75. **(2)**



$F^1\text{–}S\text{–}F^3$
$F^2\text{–}S\text{–}F^4$'
$F^5\text{–}S\text{–}F^6$, Each = 180°.

76. **(2)** No. of atoms = N_A × No. of moles × 3(atomicity)
= $6.023 \times 10^{23} \times 0.1 \times 3 = 1.806 \times 10^{23}$

77. **(4)** It is valid for single electron species only

78. **(3)** 

4-Bromo-6-hydroxycyclohex-2-ene-1-carboxylic acid

79. **(2)** $\overset{1}{H_2C}=\overset{2}{C}=\overset{3}{CH}-\overset{4}{CH_3}$

80. **(2)** $XeOF_4$

81. **(3)** $HO-\underset{OH}{\overset{O}{\overset{\|}{P}}}-OH$ it ionizes in three steps because three –OH groups are present.

82. **(1)** $\Delta E = 0$ for isothermal process.

83. **(2)** $2XY \rightleftharpoons X_2 + Y_2; K_c = 81$

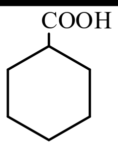
$XY \rightleftharpoons \frac{1}{2}X_2 + \frac{1}{2}Y_2;\ K_c' = ?$

$K_c' = \sqrt{K_c} = \sqrt{81} = 9$

84. **(2)** In nitrobenzene $-NO_2$ is strong electron with drawing group decreases the reactivity

85. **(2)** each double bonded Carbon must be connected to two different group

SECTION - B (Attempt Any 10 Questions)

86. **(3)**  ......Cycloheptanoic acid

87. **(4)**

Complex ion	Hybridization of central atom
$[Fe(CN)_6]^{4-}$	d^2sp^3 (inner)
$[Mn(CN)_6]^{4-}$	d^2sp^3 (inner)
$[Co(NH_3)]^{3+}$	d^2sp^3 (inner)
$[Ni(NH_3)_6]^{2+}$	sp^3d^2 (outer)

88. **(1)**

	$N_{2(g)}$ +	$3H_{2(g)}$ ⇌	$2NH_{3(g)}$
Initial moles	a	b	
At equilibrium	a-x	b-3x	2x

Total moles at equilibrium
= a – x + b – 3x + 2x = a + b – 2x

p_{N_2} = Moles fraction of $N_2 \times P = \left(\frac{a-x}{a+b-2x}\right)P$

$p_{H_2} = \left(\frac{b-3x}{a+b-2x}\right)P;\ p_{NH_3} = \left(\frac{2x}{a+b-2x}\right)P$

$$K_p = \frac{p_{NH_3}^2}{p_{N_2} \times p_{H_2}^3} = \frac{\left(\frac{2x}{a+b-2x}\right)^2 p^2}{\left(\frac{a-x}{a+b-2x}P\right)\left(\frac{b-3x}{a+b-2x}\right)^3 P^3}$$

$$= \frac{4x^2(a+b-2x)^2}{(a-x)(b-3x)^3 P^2}$$

89. **(2)** (I) Ketones do not give positive Tollen's and Fehling's test.
(II) Aromatic aldehydes do not give positive Fehling's test
(III) HCHO does not give positive haloform test

90. **(1)** Energy of photon, $E = h\upsilon = \frac{hc}{\lambda}$

$= \frac{(6.6\times10^{-23}\text{J s})(3\times10^8\text{ms}^{-1})}{5000\times10^{-10}\text{ m}} = 3.96\times10^{-19}\text{J}$

$= \frac{3.96\times10^{-19}\text{J}}{1.6\times10^{-19}\text{J/eV}} = 2.475\text{ eV}$

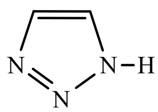
$(\because 1\text{ ev} = 1.6\times10^{-19}\text{ J})$

Kinetic energy of the emitted photon = $h\upsilon - h\upsilon_0$
= 2.475 – 2.20 = 0.275 eV
= $0.275 \times 1.6 \times 10^{-19}$ J = 4.4×10^{-20} J

91. **(4)** The correct match is
A-II, B-III, C-IV, D-I

E^o_{cell} can be determined by using this formula.

$E^o_{cell} = E_{right} - E_{left} = E_{cathode} - E_{anode}$

92. **(3)**  – Antiaromatic

93. **(3)** Due to inert effect the stability of lower oxidation state gradually increases while stability of higher oxidation state gradually decreases down the group in elements of group 13th to 15th. So correct orders are :
(iii) $Pb^{2+} > Pb^{4+}, Bi^{3+} > Bi^{5+}$
(iv) $Sn^{2+} < Pb^{2+}, Sn^{4+} > Pb^{4+}$

94. **(2)** $k = \frac{2.303}{t}\log\frac{V_\infty}{V_\infty - V_t}$ gives constant value of k.
Hence, it is 1st order reaction

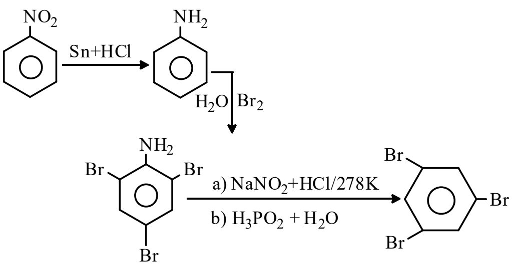
95. **(2)** The correct match is as
A-III, B-I, C-IV, D-II.

96. **(2)** $\ddot{N}H_2 - \ddot{N}H_2$ Neutral ligand
It does not act as bidentate because when it acts as bidentate a three membered ring (chelat complex) will be formed, that will be highly strained.

97. **(3)** $E_{metal} = \dfrac{W \times 96500}{It} = \dfrac{22.2 \times 96500}{2 \times 5 \times 60 \times 60} = 59.5$

Oxidation number of the metal $= \dfrac{177}{59.5} = +3$

98. **(3)**



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

100. **(3)** $C(graphite) \rightarrow C(diamond)$, $\Delta H = 1.9$ kJ

$C(graphite) + O_2 \rightarrow CO_2, \ldots\ldots - \Delta H_1$

$C(diamond) + O_2 \rightarrow CO_2, \ldots\ldots - \Delta H_2$

$(-\Delta H_1) - (-\Delta H_2) = 1.9$ kJ or $\Delta H_2 = \Delta H_1 + 1.9$

For combustion of 6 g, $\Delta H_2 > \Delta H_1$ by $1.9/2 = 0.95$ kJ

BOTANY

Section - A (35 Questions)

101. **(2)** (NCERT 12th Pg 102, based on Figure 6.5)
102. **(2)** (NCERT 11th, Page no- 26, 2nd Paragraph, Line no- 1-12)
103. **(3)** (NCERT 12th Pg 87, Para 3, Line 16)
104. **(3)** (NCERT 12th Pg. 78 , Para 1, Line 4)
105. **(3)** (NCERT 12th Pg 106, 6.4.2)
106. **(1)** (NCERT 12th Pg 75, Figure 5.5)
107. **(3)** [NCERT 11th Newly added family]
108. **(1)** (NCERT 11th, Page no- 27, 2nd Paragraph, Line no- 5-7)
109. **(1)** (NCERT 11th, Page no- 7, 2nd paragraph, line no- 21,22)
110. **(1)** (NCERT 12th, Page no- 28, 1st, 2nd and 3rd paragraph, conceptual)
111. **(1)** (NCERT 11th Para 10.1.1, Page no.163)
112. **(1)** (NCERT 11th Para 8.5.8, Page no.137)
113. **(2)** (NCERT 11th Para8.5.3.4 , Page no.134)
114. **(2)** (NCERT 11th Page no. 216, 13.7.2, Page no. 218, 13.8 - CONCEPT BASED and Page no. 220 1st paragraph)
115. **(3)** (NCERT 11th Page no. 212 – 19th line and Page 13.6 -concept based)
116. **(4)** [NCERT 11th , Page 248, point 15.4.3.1]
117. **(1)** [NCERT 11th , Page 248, Point 15.4.3.1]
118. **(2)** (NCERT 12th Page no. 247 fig.14.3 conceptual)
119. **(1)** (NCERT 11th Pg.231, 14.4.1 Last para 2nd line)
120. **(4)** (NCERT 12th Page no- 34, 1st paragraph, Concept based)
121. **(3)** (NCERT 11th Page no.31 fig.3.1, 32 to 33, name of the plant is fucus and its life cycle diplontic so diploid is dominant, not gametophyte.)
122. **(1)** (NCERT 12th Page No 38, Last para)
123. **(2)** (NCERT 12th Pg 117, based on Figure 6.14)
124. **(4)** (NCERT 12th Pg 85, 5.4)
125. **(3)** (NCERT 11th Para 10.1.1, Page no.163)
126. **(4)** (NCERT 11th Page no.29 last line)
127. **(3)** [NCERT 11th , Page no. 93 (First paragraph) and Point no. 6.3.4]
128. **(3)** [NCERT 11th Page No. 67; Sub-topic 5.1.2]
129. **(2)** [NCERT 11th Page No. 70; Sub-topic 5.3]
130. **(3)** (NCERT 12th Pg 85 based on polygenic)
131. **(3)** (NCERT 11th Pg.237, 2nd line)
132. **(2)** (NCERT 12th Pg 122, Para 2)
133. **(4)** (NCERT 12th Pg 76, based on concept of Incomplete Dominance & law of independent assortment)
134. **(3)** (NCERT 11th Page no.34 to 35, conceptual.)
135. **(3)** (NCERT 12th Pg 101, Biochemical Characterisation of Transforming Principle)

SECTION - B (Attempt Any 10 Questions)

136. **(4)** (NCERT 11th Page no- 24, Paragraph- 2.3.3, Line no- 9 and 10)
137. **(3)** (NCERT 12th Page No. 246 2nd Para, 1st Line)
138. **(2)** [NCERT 11th Page No. 79, 80 & Newly added family]
139. **(1)** (NCERT 11th Para 8.5.8, Page no.137)
140. **(2)** (NCERT 12th Pg 105, The Experimental Proof; Pg 106, Para 3; Pg 107, Para 2)

141. **(4)** [NCERT 11th , Page 249, Point 15.4.3.2]
142. **(1)** [NCERT 11th , Page no. 88, Subpoint 6.2.1]
143. **(3)** (NCERT 11th Para 10.2, 10.4 conceptual based, Page no.165-170)
144. **(3)** (NCERT 11th Pg.230, 14.3, 3rd Paragraph, 1st line)
145. **(2)** (NCERT 11th Page no. 218, 1st paragraph)
146. **(2)** (NCERT 11th, Page no- 23, Paragraph-2nd, Line no-9-19)
147. **(1)** NCERT 12th, Page no- 34, Paragraph- 2.3, Line no- 5-8
148. **(4)** (NCERT 11th, Page no- 11, Table-1.1)
149. **(1)** (NCERT 11th Para 8.5.8, Page no.137)
150. **(4)** (NCERT 11th Page no.37 fig.3.3 (d), salvinia is heterosporous so produces male and female gametophyte i.e. dioecious gametophyte.)

ZOOLOGY

Section - A (35 Questions)

151. **(4)** (NCERT 11th Page No.- 183 - Respiratory organs)
152. **(3)** (NCERT 12th page no.60, last para)
153. **(3)** (NCERT 12th page no.64, Para 2, line 2)
154. **(3)** (NCERT 11th NCERT - Page No.- 196 - Coagulation of blood)
155. **(3)** [NCERT 12th P.No.195 2nd and 3rd Line]
156. **(1)** (NCERT 12th Page No.- 134 Immunity)
157. **(3)** (NCERT 11th Page No. 198)
158. **(4)** (NCERT 12th Page no.260,last line of 1st and fig.15.1,based)
159. **(2)** (NCERT 11th Page No. 336; Last line)
160. **(2)** NCERT 11th P.No.309, Fig.20.6]
161. **(2)** [NCERT 11th P.No.312, Disorders]
162. **(1)** [NCERT 11th P.No.321, Line 9th to 12th]
163. **(2)** [NCERT 11th P.No.321, 20th Line]
164. **(3)** (NCERT 11th Page No. 299; 1st line)
165. **(1)** (NCERT 11th Mixed question)
166. **(4)** (NCERT 11th Page No. 338, 2nd paragraph)
167. **(4)** (NCERT 12th Page no- 139, Figure 7.10)
168. **(2)** (NCERT 11th, Page no- 156, Figure-9.6)
169. **(4)** (NCERT 12th page no-129, 1st paragraph, line no- 11-13)
170. **(3)** [NCERT 12th P.No.198, 2nd para 3rd Line]
171. **(2)** [NCERT 12th P.No.312, 208 Last para]
172. **(1)** (NCERT 12th Page No.- 155 - Common Diseases)
173. **(3)** (NCERT 11th, Page no- 147, 2nd paragraph, Line no- 1st line)
174. **(4)** (NCERT 12th Para 10.1, 10.2.2, 10.5 Page no.181,182,187)
175. **(3)** (NCERT 11th based extra)
176. **(2)** (NCERT 12th page no-128, 1st paragraph, line no-1 and 2)
177. **(4)** [NCERT 11th P.No.310, Last Para]
178. **(2)** (NCERT 12th page no. 52, factual)
179. **(3)** (NCERT 12th page no.62, para1)
180. **(2)** (NCERT 12th page no 43, para1)
181. **(2)** (NCERT 12th page no 44, para1)
182. **(2)** (NCERT 11th page no 112, para1, line 16)
183. **(2)** (NCERT 11th Page No. 53; examples of arthropoda)
184. **(4)** (NCERT 12th Para 10.2.1Page no.182)
185. **(3)** (NCERT 12th NCERT Page no.260,1st para last line and fig.15.1)

SECTION - B (Attempt Any 10 Questions)

186. **(3)** (NCERT 11th Page No.- 199 - Cardiac cycle)
187. **(1)** (NCERT 12th Page No.- 156 - Cancer)
188. **(3)** (NCERT 11th page no.104, para2)
189. **(2)** (NCERT 11th page no 102, last para)
190. **(2)** (NCERT 11th Page No. 297; 4th line)
191. **(4)** (NCERT 12th page no-127, 3rd paragraph, line no- 34)
192. **(2)** (NCERT 11th, Page no- 158, Paragraph- 9.12.5)
193. **(4)** (NCERT 12th Para 10.4 Page no.185)
194. **(3)** [NCERT 12th P.No.213, 2nd and 3rd para]
195. **(3)** (NCERT 11th Page No. 339; 8th line of 4th Paragraph)
196. **(4)** (NCERT 12th Page No. 142-143)
197. **(4)** [NCERT 11th P.No.304,Last Para]
198. **(4)** [NCERT 11th P.No.321, Forebrain and Hindbrain para]
199. **(3)** (NCERT 12th Page no.264 to 265.)
200. **(4)** (NCERT 12th Page no.229 1st para,6th LINE)