KAB Model NEET-2017
Key & Solutions

1) 1	**2)** 4	**3)** 2	**4)** 1	**5)** 4	**6)** 2	**7)** 2	**8)** 2	**9)** 3	**10)** 1
11) 3	**12)** 2	**13)** 3	**14)** 4	**15)** 3	**16)** 3	**17)** 3	**18)** 4	**19)** 1	**20)** 2
21) 4	**22)** 4	**23)** 1	**24)** 2	**25)** 1	**26)** 2	**27)** 2	**28)** 3	**29)** 2	**30)** 3
31) 3	**32)** 2	**33)** 2	**34)** 3	**35)** 2	**36)** 3	**37)** 1	**38)** 2	**39)** 2	**40)** 3
41) 3	**42)** 2	**43)** 3	**44)** 1	**45)** 4	**46)** 4	**47)** 2	**48)** 3	**49)** 2	**50)** 2
51) 3	**52)** 2	**53)** 1	**54)** 1	**55)** 1	**56)** 2	**57)** 2	**58)** 4	**59)** 2	**60)** 1
61) 1	**62)** 4	**63)** 1	**64)** 3	**65)** 3	**66)** 3	**67)** 2	**68)** 3	**69)** 2	**70)** 2
71) 3	**72)** 1	**73)** 3	**74)** 3	**75)** 2	**76)** 2	**77)** 2	**78)** 4	**79)** 3	**80)** 1
81) 1	**82)** 4	**83)** 4	**84)** 1	**85)** 1	**86)** 3	**87)** 2	**88)** 4	**89)** 1	**90)** 4
91) 3	**92)** 1	**93)** 3	**94)** 2	**95)** 3	**96)** 3	**97)** 2	**98)** 2	**99)** 1	**100)** 4
101) 2	**102)** 4	**103)** 1	**104)** 1	**105)** 1	**106)** 3	**107)** 4	**108)** 4	**109)** 4	**110)** 2
111) 1	**112)** 3	**113)** 2	**114)** 1	**115)** 4	**116)** 2	**117)** 1	**118)** 3	**119)** 3	**120)** 3
121) 4	**122)** 1	**123)** 2	**124)** 4	**125)** 4	**126)** 3	**127)** 3	**128)** 2	**129)** 3	**130)** 3
131) 4	**132)** 2	**133)** 2	**134)** 4	**135)** 3	**136)** 1	**137)** 2	**138)** 3	**139)** 2	**140)** 4
141) 1	**142)** 2	**143)** 2	**144)** 3	**145)** 2	**146)** 2	**147)** 1	**148)** 4	**149)** 2	**150)** 3
151) 4	**152)** 3	**153)** 1	**154)** 3	**155)** 3	**156)** 4	**157)** 4	**158)** 2	**159)** 1	**160)** 2
161) 3	**162)** 3	**163)** 1	**164)** 3	**165)** 2	**166)** 2	**167)** 4	**168)** 4	**169)** 1	**170)** 2
171) 1	**172)** 1	**173)** 2	**174)** 2	**175)** 1	**176)** 1	**177)** 2	**178)** 1	**179)** 1	**180)** 3

PHYSICS

1) 1

$$t=\sqrt{\frac{2h}{g+a}}=\sqrt{\frac{2\times 5}{9.8+0.2}}=1\sec$$

2) 4

$$Power\left(P\right)=\frac{nE}{t}$$

Number of fissions required $n=\frac{Pt}{E}$

$$=\frac{1\times 10^{3}J\times 1}{200\times 10^{6}\times 1.6\times 10^{19}J}=0.3125\times 10^{14}$$

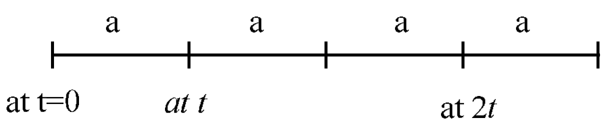
$$=3.125\times 10^{13}$$

3) 2

$r=\frac{mV}{Bq};He^{+2}$ is equivalent to $\alpha-particle$

$$r\propto\frac{m}{q};\frac{r_{\alpha}}{r_{p}}=\left(\frac{m}{q}\right)_{\alpha}\left(\frac{q}{m}\right)_{p}=\frac{4}{2}\times\frac{1}{1}=2$$

4) 1



$$t=\frac{T}{6}\Rightarrow T=6t$$

5) 4

For same material, resistivity is same

$$R=\frac{sl}{\pi r^{2}}\Rightarrow R\alpha\frac{\ell}{r^{2}}$$

$$R_{1}:R_{2}=\frac{l_{1}}{r_{1}^{2}}:\frac{l_{2}}{r_{2}^{2}}=\frac{8\times 10^{-2}}{\left(2\times 10^{-3}\right)^{2}}:\frac{5\times 10^{-2}}{\left(5\times 10^{-3}\right)^{2}}=10:1$$

$$V_{1}:V_{2}=R_{1}:R_{2}$$

First wire is longer so

$$V_{1}=\left[\frac{R_{1}}{R_{1}+R_{2}}\right]V=22\left(\frac{10}{10+1}\right)=\frac{22\times 10}{11}=20V$$

6) 2

For no dispersion, the required conditions is

$$\frac{A^1}{A}=\frac{(\mu_v-\mu_r)}{(\mu_v^1-\mu_r^1)}$$

$A=5°;\mu_V=1.523;\mu_r=1.514$

For flint glass

$A^1=?;\ \mu_V^1=1.632;\mu_V^1=1.614$

$$\therefore\frac{A^1}{5°}=\frac{(1.523-1.514)}{(1.632-1.614)}or\frac{A^1}{5°}=\frac{0.009}{0.018}=\frac{1}{2}$$

7) 2

$V=18km/h=5m/s$

$l=5m$

Strain rate $=\frac{V}{l}$

Coefficient of viscosity, $\eta=\frac{\text{shearing stress}}{\text{strain rate}}$

$\therefore$ Shearing stress $=\eta\times$ strain rate

$$=10^{-2}\times\frac{5}{5}=10^{-2}Nm^{-2}$$

8) 2

$C_1=$ Capacitance of the capacitor in the first case $=\frac{k_1\in_0 A}{t_1}$;

$C_2=$ Capacitance of the capacitor in the second case $=\frac{\in_0 A}{\frac{t_1}{k_1}+\frac{t_2}{k_2}}=\frac{k_1k_2\in_0 A}{t_1k_2+t_2k_1}$

Given that $\frac{k_1\in_0 A}{t_1}=\frac{2k_1k_2\in_0 A}{t_1k_2+t_2k_1}$

Here $t_1=3,k_1=4,t_2=5,k_2=?$ $\quad\frac{1}{3}=\frac{2k_2}{3k_2+20}\therefore k_2=\frac{20}{3}=6.67$

9) 3

$V\propto\lambda^a\rho^b g^c$

$$\Rightarrow(LT^{-1})\propto L^a(ML^{-3})^b(LT^{-2})^c$$

$\Rightarrow LT^{-1}=KL^{a-3b+c}M^bT^{-2c}$ where $K=$ constant

Comparing the powers of M, L, T on both sides, we get

$$a=\frac{1}{2},b=0,c=\frac{1}{2}$$

10) 1

$200 - f_k = ma$

$300 - f_k = m2a$

$$\frac{200-f_k}{300-f_k} = \frac{1}{2} \Rightarrow 400 - 2f_k = 300 - f_k \Rightarrow f_k = 100$$

But $f_k = \mu_k mg \Rightarrow \mu_k = \frac{f_k}{mg} = \frac{100}{100 \times 10} = 0.1$

11) 3

$u_x \rightarrow$ Horizontal velocity (initial), $u_x = \frac{40}{2} = 20\,\text{m/s}$

$u_y \rightarrow$ Vertical velocity (initial), $50 = u_y t + \frac{1}{2}gt^2 = u_y \times 2 + \frac{1}{2}(-10) \times 4$

or, $50 = 2u_y - 20$

or, $u_y = \frac{70}{2} = 35\,\text{m/s}$

$\therefore \tan\theta = \frac{u_y}{u_x} = \frac{35}{20} = \frac{7}{4}$

$\Rightarrow \tan\theta = \tan^{-1}\frac{7}{4}$

12) 2

$\lambda_m \propto T$

$E \propto T^4 A$

$\Rightarrow E \propto T^4 R^2$

$E \propto \frac{R^2}{\lambda^4}$

$$\Rightarrow \frac{E_A}{E_B} = \left(\frac{\lambda_B}{\lambda_A}\right)^4 \left(\frac{R_A}{R_B}\right)^2 = 9^2 \times \left(\frac{6}{18}\right)^2 = 9$$

$\therefore E_A / E_B = 9:1$

13) 3

$$f = \frac{1}{2\pi}\sqrt{\frac{K}{m+M}} = \frac{1}{2\pi}\sqrt{\frac{600}{0.5+1}} = \frac{10}{\pi}Hz$$

$KE = \frac{1}{2}KA^2$

$$\frac{p^2}{2(m+M)} = \frac{(mV)^2}{2(m+M)} = \frac{1}{2}KA^2$$

$$\frac{1}{2}600A^2 = \frac{(0.5 \times 3)^2}{2(0.5+1)} \Rightarrow A = \frac{1}{20}m = 5cm$$

14) 4

$$mg = 2\pi rT$$

$$\Rightarrow T = \frac{mg}{2\pi r}$$

$$\Rightarrow T = \frac{9\times10^{-5}\times9.8}{2\times3.14\times2\times10^{-3}}$$

$$T = 0.07Nm^{-1}$$

15) 3

Given that,

$$G = 25\Omega, i_g = 6\times10^{-3}A$$

We know that,

$$V = i_g(G+R) \Rightarrow 6 = 6\times10^{-3}[25+R]$$

$$\therefore R = 975\Omega$$

Which is connected in series to the galvanometer

16) 3

Diameter (2R)=6m

$$\Rightarrow mass(m) = 400kg$$

$$\Rightarrow I = \frac{MR^2}{2} = \frac{400\times(3)^2}{2} = 1800kg - m^2$$

$$\Rightarrow \omega_0 = 100r.p.m = 100\times\frac{2\pi}{60} = \frac{10\pi}{3} rad/s$$

$$\Rightarrow \omega = 50r.p.m = 50\times\frac{2\pi}{60} = \frac{5\pi}{3} rad/s \text{ and } t = 20\sec$$

$$\alpha = \frac{\omega-\omega_0}{t} = \frac{\left(\frac{5\pi}{3}\right)}{20} = \frac{\pi}{12} rad/s^2$$

$$\tau = I\alpha$$

$$\tau = 1800\times\frac{\pi}{12} = 150\pi = 150\times3.14 = 15\times31.4$$

$$\tau = 471.0N - m$$

17) 3

$$Q = \frac{KA(\theta_1-\theta_2)t}{L} = \frac{K\pi r^2\theta_1 t}{L} = mL_{ice} = Vd\,L_{ice} = \frac{4}{3}\pi r^3 d\,L_{ice}$$

$$\Rightarrow \frac{kt}{L}\alpha r \text{ or } K\alpha\frac{rL}{t}$$

$$\frac{k_1}{k_2} = \frac{r_1}{r_2}\times\frac{L_1}{L_2}\times\frac{t_2}{t_1}$$

$$= \frac{2r_2}{r_1}\times\frac{L_2/4}{L_2}\times\frac{16}{25} = \frac{8}{25}$$

18) 4

$\left(y^2+x^2\right)=3\left(y^2-x^2\right)$

$4x^2=2y^2 \Rightarrow y^2=2x^2 \Rightarrow y=\sqrt{2}x$

19) 1

Magnification is $m=\dfrac{f}{u-f}$

When $u=25cm, m_1=\dfrac{f}{25-f}$

When $u=40cm, m_2=\dfrac{f}{40-f}$

Given $m_1=4m_2$

$\therefore \dfrac{f}{25-f}=4\left(\dfrac{f}{40-f}\right)$

On solving we get

$f=20cm$

20) 2

$$W=\int F\ dy=\int_{-a}^{+a}\left(Ay^2+By+C\right)\ dy=\frac{2Aa^3}{3}+2Ca$$

21) 4

Energy (E)=charge ×potential diff

$E_{electron}=q_c$ V and $E_{proton}=q_p 4V$

De-Broglie wavelength $\lambda=\dfrac{h}{p}=\dfrac{h}{\sqrt{2mE}}$

$\lambda_e=\dfrac{h}{\sqrt{2m_e eV}}$ and $\lambda_p=\dfrac{h}{\sqrt{2m_e e4V}}$

$(\because q_e=q_p)$

$$\because \frac{\lambda_e}{\lambda_p}=\frac{\dfrac{h}{\sqrt{2m_e eV}}}{\dfrac{h}{\sqrt{2m_p e4V}}}=\sqrt{\frac{2m_p 4V}{2m_e eV}}=2\sqrt{\frac{m_p}{m_e}}$$

22) 4

$(KE_T+KE_R)_1=PE_2$

$\dfrac{1}{2}mV^2+\dfrac{1}{2}I\omega^2=mgh$

$\dfrac{1}{2}mV^2\left(1+\dfrac{K^2}{r^2}\right)=mg\dfrac{3V^2}{4g}$

$\Rightarrow \dfrac{K^2}{r^2}=\dfrac{1}{2} \Rightarrow disc$

23) 1

$$\overrightarrow{r_{Cm}} = \frac{m_1\overrightarrow{r_1} + m_2\overrightarrow{r_2} + m_3\overrightarrow{r_3}}{m_1 + m_2 + m_3} = \frac{2(-2\hat{i}) + 2(-3\hat{j}) + 2\hat{k}}{6}$$

$$= \frac{-2\hat{i} - 3\hat{j} + \hat{k}}{3}$$

$$r_{cm} = \left|\vec{r}_{cm}\right| = \sqrt{\frac{4}{9} + \frac{9}{9} + \frac{1}{9}} = \sqrt{\frac{14}{9}}\, m$$

$$r_{cm} = \frac{14}{9} m$$

24) 2

$$V_0 = \frac{V_e}{2}$$

$$\sqrt{\frac{GM}{R+h}} = \frac{1}{2}\sqrt{\frac{2GM}{R}} \Rightarrow \frac{1}{R+h} = \frac{1}{2R} \Rightarrow h = R$$

$$PE_1 + KE_1 = PE_2 + KE_2 \Rightarrow \frac{-GMm}{R+h} + 0 = \frac{-GMm}{R} + \frac{1}{2}mV^2$$

$$\Rightarrow V = \sqrt{\frac{GM}{R}} = \sqrt{gR} = \sqrt{10 \times 6400 \times 10^3} = 8 km/s$$

25) 1

$$n_0 = \frac{V}{2l_0}; l_0 = \frac{V}{2n_0}; n_c = \frac{V}{4l_c}, l_c = \frac{V}{4n_c}$$

$$l_0 + l_c = \frac{V}{4n_0} + \frac{V}{4n_c}$$

$$n = \frac{V}{l_0 + l_c} \Rightarrow n = \frac{V}{4\left[\frac{V}{2n_0} + \frac{V}{4n_c}\right]} = \frac{n_0 n_c}{2n_c + n_0}$$

26) 2

$$\alpha = \frac{l_1\alpha_1 + l_2\alpha_2}{l_1 + l_2} \text{ and } \gamma = 3\alpha = 4 \times 10^{-5} / ^\circ C$$

$$= \frac{4}{3} \times 10^{-5} / ^\circ C$$

27) 2

Potential gradient $= \frac{2}{10} \times \frac{8}{4}$

$= 0.4\Omega / m$

$E = 0.4 \times 2.51V$

$\left(\frac{E}{R+r}\right)R = 0.4 \times 2$

$\frac{1 \times R}{R+r} = 0.8$

$R = 0.8R + 0.8r$

$0.2R = 0.8r$

$R = 4r$

Now

$i = \frac{E}{R+r}$

$0.2 = \frac{1}{4r+r}$

$\Rightarrow r = 1\Omega$

28) 3

Conceptual

29) 2

$V = \alpha + \beta t^2$

$u = 3m/s$

$u = (3) + (0.1 \times 5^2) = 5.5m/s$

$a = \frac{5.5-3}{5} = 0.5\ m/s^2$

30) 3

Current does not flow through D_2 and same current flows through A_1, A_3

31) 3

$F = P \times 2\pi rt$

$= 3.5 \times 10^8 \times 2 \times \frac{22}{7} \times \frac{1}{2} \times 10^{-2} \times 0.3 \times 10^{-2}$

$= 3.3 \times 10^4 N$

32) 2

In a single slit experiment, for diffraction maxima,

a $\sin\theta = (2n+1)\frac{\lambda}{2}$ and for diffraction minima, a $\sin\theta = n\lambda$.

According to question,

$(2 \times 1 + 1)\frac{\lambda}{2} = 1 \times 6600$

$(\because \lambda_R = 6600A^\circ)$

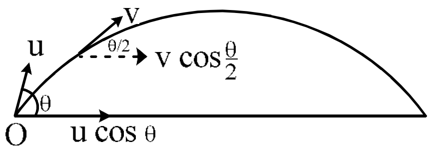
$\lambda = \frac{6600 \times 2}{3}$

$\lambda = 4400A^\circ$

33) 2

Conceptual

34) 3



In a projectile motion, the horizontal component of velocity remains constant.

$$V\cos\left(\frac{\theta}{2}\right)=u\cos\theta$$

$$V=\frac{u\cos\theta}{\cos\left(\frac{\theta}{2}\right)}=\frac{u\left(2\cos^2\frac{\theta}{2}-1\right)}{\cos\frac{\theta}{2}}$$

$$=u\left(2\cos\frac{\theta}{2}-\sec\frac{\theta}{2}\right)$$

35) 2

As $P=\frac{\mu RT}{V}$, it (i.e., P remains unaffected as n, R, T and V are constant)

36) 3

$$\eta_{\max}=1-\frac{700}{2100}=\frac{2}{3}$$

$$\therefore\frac{\eta}{\eta_{\max}}\times 100=\frac{2/5}{2/3}\times 100=60\%$$

37) 1

We know that H=*nl* and B= $\mu_0\mu_r nl$ and $\mu_r=1+\chi_m$

On heating, the core of solenoid, *n* and *l* remain constant. Hence $\vec{H}$ field remains constant.

But there is a large decrease in the susceptibility (χ_m) of the core on heating it beyond its critical temperature. Hence $\overline{B}$ field decreases drastically.

Susceptibility of soft iron core,

$$\chi_m=\mu_r-1=1000-1=999\approx 10^3$$

Susceptibility of paramagnetic material is $\chi_m^{'}\approx 10^{-5}$

Magnetisation in the core, $\overrightarrow{M}=\chi_m\vec{H}$

$$\therefore\frac{M}{M'}=\frac{\chi_m}{\chi_m^{'}}=\frac{10^3}{10^{-5}}=10^8$$

38) 2

For eye piece

$$\frac{1}{f_e}=\frac{1}{u_e}-\frac{1}{V_e}(\because\ final\ image\, is\, virtual)$$

Here $V_e = D = 25cm$

$$\therefore \frac{1}{5}=\frac{1}{u_e}-\frac{1}{25}$$

But length of the microscope is $L = V_0 + u_e\ or$

$$20 = V_0 + \frac{25}{6}, Hence V_0 = \frac{95}{6}cm$$

Total magnification $m=\left(\frac{V_0 - f_0}{f_0}\right)\left(1+\frac{D}{f_e}\right)$

or $m=\left(\frac{\frac{95}{6}-0.95}{0.95}\right)\left(1+\frac{25}{5}\right)\ or\ \ m=\left(\frac{94}{6}\right)(6)=94$

39) 2

We know that resonant frequency in an L-C-R circuit is given by

$$v_0 = \frac{1}{2\pi\sqrt{LC}}$$

Now to reduce v_0 either we can increase L or we can increase C.

To increase capacitance, we must connect another capacitor in parallel to the first.

40) 3

Radiation pressure (P) is the force exerted by electromagnetic wave on unit area of the surface. i.e., rate of change of momentum per unit area of the surface.

Momentum per unit time per unit area

$$=\frac{Intensity}{Speed\ of\ wave}=\frac{I}{c}$$

Change in momentum per unit time per unit area $=\frac{\Delta I}{c}=$ radiation pressure (P)

i.e., $P=\frac{\Delta I}{c}$

Momentum of incident wave per unit time per unit area $=\frac{I}{c}$

When wave is full absorbed by the surface, the momentum of the reflected wave per unit time per unit area =0.

Radiation pressure (P)=change in momentum per unit time area $=\frac{\Delta I}{c}=\frac{I}{c}=0=\frac{I}{c}$.

When wave is totally reflected, then momentum of the reflected wave per unit time per unit area $=\frac{I}{c}$. Radiation pressure $P=\frac{I}{c}-\left(-\frac{I}{c}\right)=\frac{2I}{c}$.

Hence P lies between $\frac{I}{c}$ and $\frac{2I}{c}$.

41) 3

$U = 3 + 2pV$

In an adiabatic process

$dQ = 0 = dU + dW = 0$

$\Rightarrow dU = -dW = -P\,dV$

$2PdV + 2VdP = -PdV$

$(2+1)PdV = -2VdP$

$$\gamma P = \text{Bulkmodulus} = \text{K} = = \frac{-dP}{\left(\frac{dV}{V}\right)} = \frac{(2+1)P}{2}$$

$$\Rightarrow \frac{3}{2}P = \gamma P \Rightarrow \gamma = \frac{3}{2}$$

42) 2

β particle carries one unit of negative charge, and α-particle carries 2 units of positive charge and γ (particle) carries no charge, therefore electronic energy levels of the atom change for α and β decay, but not for γ-decay.

43) 3

The magnetic flux linked with uniform surface of area A in uniform magnetic field is given by $\phi = \vec{B}.\vec{A}$

Hence $\vec{A} = L^2\hat{k}$ and $B = B_0\left(2\hat{i} + 3\hat{j} + 4\hat{k}\right)T$

$\therefore \phi = B_0\left(2\hat{i} + 3\hat{j} + 4\hat{k}\right).L^2\hat{k} = \left(4B_0L^2\right)Wb$

44) 1

The electrostatic force of attraction between electron and nucleus is a central force which provide necessary centripetal force for circular motion of electron.

The simple Bohr model cannot be directly applied to calculate the energy levels of an atom with many electrons. This is because of the electrons not being subject to a central force.

45) 4

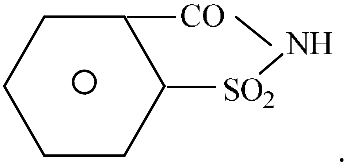
$$V = \frac{1}{4\pi \in_0}\frac{q}{r} \Rightarrow q = V\left(4\pi \in_0 r\right)$$

$$V^1 = \frac{1}{4\pi \in_0}\frac{q}{R} = \frac{1}{4\pi \in_0}\frac{V\left(4\pi \in_0 r\right)}{R}$$

$$= \frac{Vr}{R} = \frac{120 \times 2}{6} = 40V$$

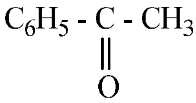
CHEMISTRY

46) 4

Saccharin is 

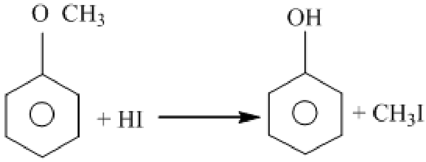
The chemical name is ortho – sulphobenzimide.

47) 2



has α 'H' ∴ It can undergo aldol condensation. It also has α– CH_3 group ∴ can undergo haloform test.

48) 3



The bond between Benzene and 'O' does not break owing to partial double bond character, due to resonance. But the bond between CH_3 & O breaks.

49) 2

$SO_2 + 2H_2O \longrightarrow H_2SO_4 + 2[H]$

∴ SO_2 Bleaches by reduction in presence of moisture.

50) 2

$Mn - [Ar]3d^5 4s^2$

$Mn^{2+} - [Ar]3d^5$ (5 unpaired $e^- s$)

$\rightarrow Fe - [Ar]3d^6 4s^2$

$Fe^{+3} - [Ar]3d^5 4s^0$ (5 unpaired $e^- s$)

∵ Mn^{+2}, Fe^{+3} have same no. of unpaired electrons. Thus they have same magnetic moment.

51) 3

$ClF_3 + 3H_2O \longrightarrow 3HF + HClO_2$

More E.N. halogen gives hydride, and less E.N. gives oxoacid with halogen having same oxidation state.

52) 2

$\rightarrow \lambda$ of e^- in 1st orbit
of H = 3.3°A

$\rightarrow \lambda$ of e^- in any other orbit of H = 3.3× n°A

Where n = 1,2, 3 etc.

→ 3.33 × 10 = 33.3 (10th orbit)

→ 3.33 × 3 = 9.99 (3rd orbit)

→ 3.33 × 6 = 19.98 (6th orbit)

But 4.98°A is 3.33 × 1.5 and hence 4.98°A is not possible.

53) 1

E.A. = Exothermic

I.P. = Endothermic

IP_1 of N > $I.P_1$ of O

54) 1

In B_2 2 unpaired electrons present in $2P_\pi$ bonding M.O.S.

B_2=10 $\sigma 1s^2 \sigma 1s^{2*} \sigma 2s^2 \sigma 2s^{2*} \pi_{2P_x^1} = \pi_{2p_y^1}$

.55) 1

$$P^H = -\log\left[H^+\right]$$

$$\because \text{weak acid}\left[H^+\right] = C\alpha = 0.08 \times 0.1 = 0.008$$

$$P^H = -\log[0.008]$$

$$= -\log\left[8 \times 10^{-3}\right]$$

$$3 - \log 8$$

$$3 - 0.9030 = 2.0970$$

56) 2

Li_2CO_3 is unstable CO_3^{2-} of IA group due to small size of Li^+.

$\therefore$It decomposes easily - $Li_2CO_3 \rightarrow Li_2O + CO_2$.

57) 2

$$\pi_{K_x\left[Fe(CN)_6\right]} = \pi_{urea}$$

$$iC_1RT_1 = C_2RT_2$$

$$i = n = 4$$

$$\therefore x = 3$$

$$K_3\left[Fe(CN)_6\right] \longrightarrow 3K^{\oplus} + \left[Fe(CN)_6\right]^{3-}$$

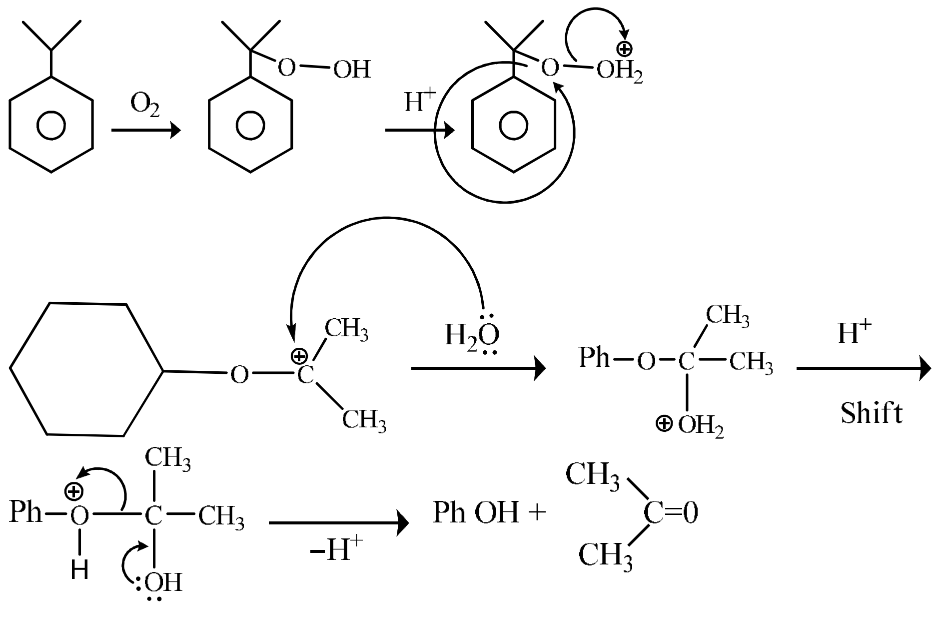
$$n = 4$$

58) 4

$(CH_3)_2 CH \underset{Cl}{\underset{|}{C}} H\, CH = CHCl$

As there are two stereogenic units, (double bond & chlorine bearing carbon) the number of stereo isomers are $2^2 = 4$

59) 2

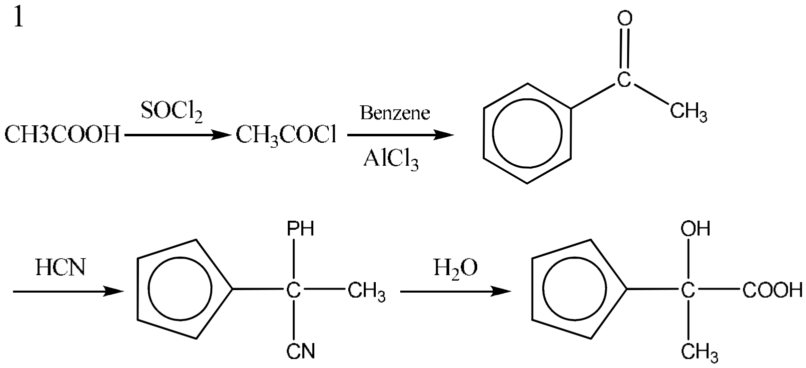


60) 1

$$CH_3MgX + CdCl_2 \longrightarrow \underset{(A)}{(CH_3)_2 Cd} + MgCl_2$$

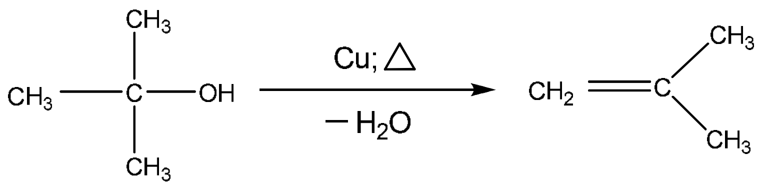
$$\underset{(B)}{(CH_3)_2 Cd + CH_3CH_2COCl} \longrightarrow CH_3 - \overset{O}{\overset{|}{C}} - CH_2CH_3 + CdCl_2$$

61) 1



62) 4

Compound (*X*) must be 3° alcohol, which undergoes dehydration to give alkene, when heated with copper.

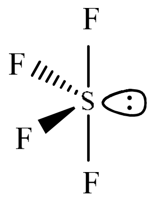


63) 1

$3Cl_2 + 6OH^- \longrightarrow 5Cl^- + ClO_3^- + 3H_2O$

6 moles of $NaOH$ causes disproportionation of 3 moles of Cl_2, out of which 1mole-atm undergoes oxidation i.e., 35.5 gm

64) 3



In SF_4, there are two axial and two equatorial bounds.

65) 3

Movement of particles towards anode indicates that they are negatively charged and are therefore coagulated by cations

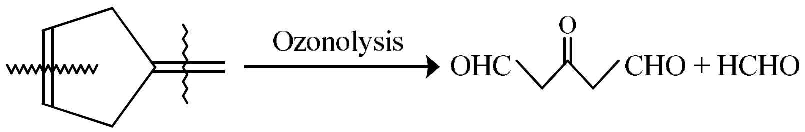
$\because$ Coagulating power $\propto$ magnitude of charge

$\therefore$ Coagulating power: $Al^{3+} > Ba^{2r} > Na^{\oplus}$

66) 3

$\underset{(X)}{FeO.Cr_2O_3} + Na_2CO_3 + O_2 \longrightarrow \underset{(Y)}{Na_2CrO_4} + \underset{+CO_2}{Fe_2O_3}$

67) 2



68) 3

Thymine is present in DNA where as Uracil is present in RNA

69) 2

1) $Zn + 2NaOH \rightarrow Na_2ZnO_2 + H_2$

2) $P_4 + 3NaOH + 3H_2O \rightarrow 2NaH_2PO_2 + PH_3$

3) $Si + 2NaOH + H_2O \rightarrow Na_2SiO_3 + 2H_2$

4) $2Al + 2NaOH + 2H_2O \rightarrow 2NaAlO_2 + 3H_2$

70) 2

The hypochlorites disproportionate on heating as follows.

$3ClO^- \rightarrow 2Cl^- + ClO_3^-$

71) 3

The correct increasing basic strength: $SbH_3 < AsH_3 < PH_3 < NH_3$

NH_3 is the most basic because of its small size, the electron density of electron pair is concentrated over small region. As the size increases, the electron density gets diffused over a large surface area and hence the ability to donate the electron pair (basicity) decreases.

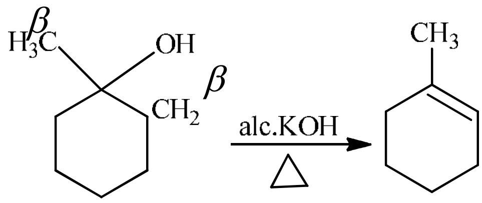
72) 1

Lactose is a disaccharide of D-Glucose and D-Galactose.

'C_1' of Galactose is linked to 'C_4' of Glucose through β – linkage.

73) 3

Acc to saytzeffs rule during β elimination. 'H' is removed from that β'C' which has less no. of 'H'.



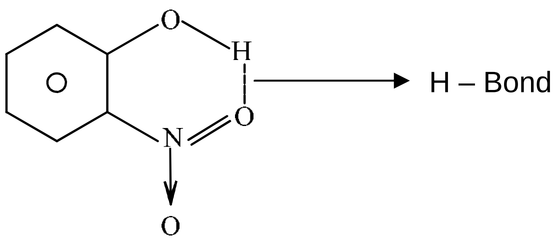
is major product.

74) 3

$B_2H_6 + H_2O \rightarrow X + H_2$ $X \xrightarrow{100°C} Y + H_2O$

$X = H_3BO_3$ $Y = B_2O_3$ $CoO + B_2O_3 \rightarrow$ Blue colour $Co(BO_2)_2$

75) 2



76) 2

Enthalpy is state function and extensive thermodynamic property.

∵ Enthalpy depends on initial and final state of the system. It also depends on the amount of substance.

77) 2

$PCl_3 + 3C_2H_5OH \rightarrow 3C_2H_5Cl + H_3PO_3$

$PCl_5 + C_2H_5OH \rightarrow C_2H_5Cl + POCl_3 + HCl$

To get 4moles C_2H_5Cl the ratio of number of moles of PCl_3 and PCl_5 required is 1:1

78) 4

Conc. HNO_3 oxidises $-CH_2OH$ group to COOH group

79) 3

$r_1 = K[A]^2[B]; r_2 = K[2A]^2[2B] = 8r_1$

80) 1

Copper is below Hydrogen in the electro chemical series

81) 1

$Mn(CO)_5 + \bar{e} \longrightarrow [Mn(CO)_5]^-$

less stable more stable, as EAN of $Mn = 36(Kr)$

82) 4

$$Ag_2S + 4NaCN + 2O_2 \longrightarrow Na_2SO_4 + 2Na\left[Ag\left(CN\right)_2\right]$$

O_2 is passed during leaching in order to oxidiseSulphide to Sulphate, this will prevent the backward reaction.

83) 4

$$pOH = 4.8 + \log\frac{2\left(0.05\right)}{0.1}$$

84) 1

C_{rms} of 'X' at 400K = C_{mp} of Y at 60K

$$\sqrt{\frac{3RT_x}{M_x}} = \sqrt{\frac{2RT_y}{M_y}}$$

$$\frac{3\times 400}{40} = \frac{2\times 60}{M_y}$$

$$\therefore M_y = 4\ g/mole$$

85) 1

For $AgBr, 5\times10^{-13} = 0.1\left[Ag^+\right] \Rightarrow \left[Ag^+\right] = 5\times10^{-12}M$

For $AgCl, 1.8\times10^{-10} = 0.1\left[Ag^+\right] \Rightarrow \left[Ag^+\right] = 1.8\times10^{-9}M$

For $Ag_2CO_3, 8.1\times10^{-12} = 0.1\left[Ag^+\right]^2 \times 0.1 \Rightarrow \left[Ag^+\right] = \sqrt{8.1\times10^{-11}} = 9\times10^{-6}M$

For $Ag_3AsO_4, 10^{-22} = \left[Ag^+\right]^3 \times 0.1 \Rightarrow \left[Ag^+\right]^3 = 10^{-21}\left[Ag^+\right] = 10^{-7}M$

86) 3

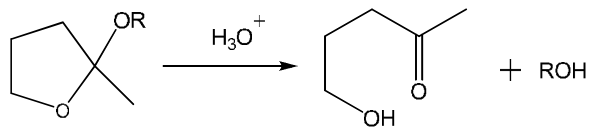
$$(\Delta S) = {}^{n}C_{p,m}\ln\frac{T_2}{T_1}$$

$$= 2\times\frac{5}{2}R\ln\frac{600}{300}$$

87) 2

a) Terylene is a polymer of Terephthalic acid ethylene glycol.
b) Nylon-6,6 is a polymer of Adipic acid and hexamethylene diamine.
c) PVC (Poly vinyl chloride) is an addition polymer of vinyl chloride.
d) Buna-S is styrene butadiene rubber.

88) 4



89) 1

The molecule has 4 stereocenters, yet it is known only to exist as an enantiomeric pair. The bridges must be cis and, therefore the configurations of the bridgehead carbons are not independent

90) 4

In Na_2O, O^{2-} forms CCP and $Na^{\oplus}$ ions occupy tetrahedral voids.