FULL PAPER TEST KEY SOLUTIONS – 2

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

Solution :-

1) It frequency of incident light is less than threshold frequency there is no photoelectric emission.

2) If the incident wave length is doubled there may be photo emission or may not because $\lambda_{\text{incident}} > \lambda_{\text{thershold}}$ no emission.

3)
$$C = \frac{Q}{V} = \frac{Q}{\frac{1}{4\pi\varepsilon_0}\frac{Q}{R}} = 4\pi\varepsilon_0 R$$
$$= 4\pi\varepsilon_0\left(\frac{3V}{A}\right)$$
$$= 12\pi\varepsilon_0\frac{V}{A}\left(\because V = \frac{4}{3}\pi R^3\right)$$
$$A = 4\pi R^2$$
$$\frac{V}{A} = \frac{R}{3}$$

4)
$$K.E \propto V^2$$
from $\lambda = \frac{h}{mV}$
as $V \uparrow \lambda \downarrow$

5)
$$\text{Voltage gain} = \frac{Output\ voltage}{Input\ voltage}$$
$$\Rightarrow V_{out} = V_{in} \times \text{Voltage gain}$$
$$\Rightarrow V_{out} = V_{in} \times \text{Current gain} \times \text{Resistance gain}$$
$$= V_{in} \times \beta \times \frac{R_L}{R_{BE}} = 10^{-3} \times 100 \times \frac{10}{1} = 1V.$$

6)
$$KE_{\max} = E - W$$
$$eV_0 = \frac{1240}{\lambda(nm)}ev - W\,ev$$
$$eV_0 = \frac{1240}{500} - 2.28$$
$$eV_0 = 2.48 - 2.28$$
$$eV_0 = 0.2\,eV$$
$$V_0 = 0.2\ volt$$
$$\lambda = \frac{12.24}{\sqrt{V_0(volt)}}A^0$$
$$= \frac{12.24}{\sqrt{0.2}}A^0$$
$$\lambda \geqslant 2.8 \times 10^{-9}\ m$$
$\because\ V_0$ is minimum stopping potential

7)
$$\lambda = \frac{h}{mV} = \frac{h}{\sqrt{2mE}}$$
$$\lambda = \frac{6.6 \times 10^{-34}}{\sqrt{2 \times 9 \times 10^{-31} \times 80 \times 1.6 \times 10^{-19}}}$$
$$\lambda = 1.44\,\overset{\circ}{\text{A}}$$

8)
$$\alpha = \frac{I_c}{I_e} = \frac{I_c}{I_c + I_b} = 0.985$$
$$I_c = 0.985\,(I_c + I_b)$$
$$I_c = 0.985\ I_c + 0.985\ \text{I}_b$$
$$0.985\ \text{I}_b = 0.015\ \text{I}_\text{c} = 0.015 \times 2\ \text{mA}$$
$$I_b = \frac{0.015 \times 2}{0.985} = 0.03\,mA$$
$$I_b \approx 0.03\,mA$$

9) $I_c = 4\,mA \;:\; R_L = ?$

$v_{CE} = 4v$

$v_{BE} = 0.6v$

$\frac{\Delta v_{CE}}{\Delta v_{BE}} = \frac{\Delta I_c}{\Delta I_b} \times \frac{R_L}{R_i}$

$\frac{4}{0.6} = \frac{4}{0.3} \times \frac{R_L}{2}$

$\therefore \;\; R_L = 1\,k\Omega$

---

10) Voltage gain = $\beta \times$ Resistance gain

$\beta = \frac{\alpha}{1-\alpha} = \frac{0.99}{(1-0.99)} = 99$

Resistance gain $= \frac{10 \times 10^3}{10^3} = 10$

$\Rightarrow$ Voltage gain = 99 $\times$ 10 = 990.

---

11) $v_x = 10m/s; \;\; u_y = -8m/s$

$a_x = 2m/s \quad a_y = 8m/s$

$y = a_y t + \frac{1}{2} a_y t^2$

$0 = -8t + \frac{1}{2} 8t^2$

$4t^2 = 8t$

$t = 2\,\text{sec}$

$x = u_x t + \frac{1}{2} a_x t^2$

$= 10\,(2) + \frac{1}{2}(2)\,(2)^2$

$= 20 + 4$

$= 24\,m$

---

12) $V_0 = \frac{(E - W_0)}{e} = \frac{(2eV - 0.6\,eV)}{e} = 1.4V$

---

13) $I_e = 10^{10} \times 1.6 \times 10^{-19} \times \frac{1}{10^{-6}} = 1.6\,mA \quad \left(\because I = \frac{Q}{t}\right)$

Since 2% electrons are absorbed by base, hence 98% electrons reaches the collector i.e. α = 0.98

$\Rightarrow I_c = \alpha I_e = 0.98 \times 1.6 = 1.568\,mA \approx 1.57\,mA$

Also current amplification factor $\beta = \frac{\alpha}{1-\alpha} = \frac{0.98}{0.02} = 49$

---

14) $\frac{hc}{\lambda} = W + \frac{1}{2} m V_{\max}^2$

$\frac{hc}{\lambda_1} = W + \frac{1}{2} m V_1^2 \;\rightarrow\; (1)$

$\frac{hc}{\lambda_2} = W + \frac{1}{2} m V_2^2 \;\rightarrow\; (2)$

$\sqrt{\frac{\frac{hc}{\lambda_1} - W}{\frac{hc}{\lambda_2} - W}} = \left(\frac{V_1}{V_2}\right)^2 = 4$

$\lambda_1 = 0.35\,\mu m, \;\; \lambda_2 = 0.54\,\mu m$

On solving we get $W = 1.88\,eV$

---

15) In CB amplifier Input and output voltage signal are in same phase.

(or)

In CE amplifier,

Phase difference between input and output voltage is π

---

16) Gravitational field at the place of m^1

$E = E_{sphere} + E_{shell}$

$E = \frac{Gm(X-r)}{r^3} + 0$

$F = m^1 E = \frac{Gmm^1(X-r)}{r^3}$

$F = \frac{Gmm^1(X-r)}{r^3}$

---

17) $\Delta l \alpha \frac{1}{C} \qquad C = 2\pi r$

$Y = \frac{F}{A} \times \frac{l}{\Delta}$

$Y = \frac{F}{A} \times \frac{l}{\Delta l}$

$\Delta l = \text{Elongation}$

---

18) Frequency of light of wavelength $(\lambda = 4000\,\overset{0}{A})$ is

$\nu = \frac{c}{\lambda} = \frac{3 \times 10^8}{4000 \times 10^{-10}} = 0.75 \times 10^{15}$ which is less than the given threshold frequency. Hence no photoelectric emisssion takes place.

---

19) $\lambda = \frac{h}{p} = \frac{h}{\sqrt{2MK.E}}$

$K.E = \frac{p^2}{2m}$

$p = \sqrt{2mKE}$

---

20) There we have two Isochoric curves which passes through origin so,

$V_1 = V_2 \;\&\; V_3 = V_4$

$V_1 > V_4$ because at V_4 pressure is more

$\& \; P \propto \frac{1}{V}$

---

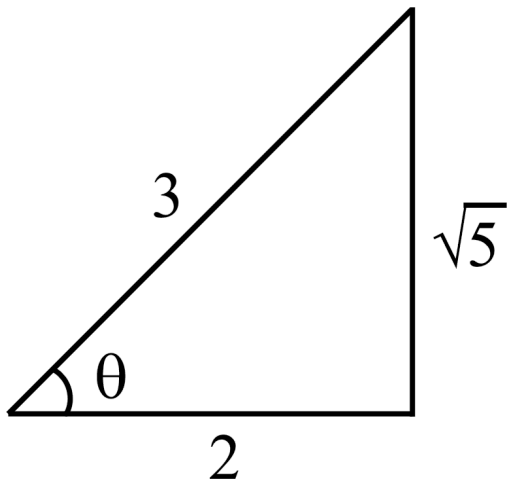
21) $\bar{a} = 6\hat{i} + 6\hat{j} - 3\hat{k},\ \bar{b} = 7\hat{i} + 4\hat{j} + 4\hat{k}$

$|\bar{a}| = \sqrt{36+36+9} = 9\ |\bar{b}| = \sqrt{49+16+16} = 9$

$\bar{a}.\bar{b} = 42 + 24 - 12 = 54$

$\cos\theta = \dfrac{\bar{a}.\bar{b}}{a\,b} = \dfrac{54}{9\times 9} = \dfrac{2}{3}$

$\sin\theta = \dfrac{\sqrt{5}}{3} \Rightarrow \theta = \sin^{-1}\left(\dfrac{\sqrt{5}}{3}\right)$



22) Velocity of e^- depends on a accelerating potential difference between anode and cathode but not no filament current and potential applied to filament

23) $V_S = \dfrac{h}{e}\upsilon - \dfrac{W_0}{e}$

Stopping potential is dependent on frequency of incident radiation.

24) Direction of scattered photon $\cos\phi = 1 - \dfrac{\Delta\lambda m_e c}{h}$

Here $\Delta\lambda = 0.011\ \overset{0}{A}$

$\therefore\ \cos\phi = 1 - \dfrac{0.011\times 10^{-10}\times 9.1\times 10^{-31}\times 3\times 10^{8}}{6.624\times 10^{-34}}$

$= 1 - 0.453 = 0.547$

$\therefore\ \phi = \cos^{-1}(0.547)$

25) $\lambda = \dfrac{h}{\sqrt{2mE}} \Rightarrow \lambda^2 = \dfrac{h^2}{2mE}$

$E = \dfrac{h^2}{2m\lambda^2}$

$E = \dfrac{\left[6.625\times 10^{-34}\right]^2}{2\times m_\alpha \times \left[0.001\times 10^{-10}\right]^2}\ ;\ m_\alpha = 6.65\times 10^{-27} kg$

$\therefore E = 1297\times 1.6\times 10^{-19}$

$E = 1297\, eV$

26) $E_i = \dfrac{E_0}{K} = \dfrac{24,000}{6} = 4000\ V/m$

27) $v = \dfrac{p}{m} = \dfrac{h}{m\lambda} = \dfrac{6.6\times 10^{-34}}{9.1\times 10^{-31}\times 10^{-10}} = 7.25\times 10^{6}\ m/s$

28) $eV_1 = h\upsilon_1 - W_0$

$eV_2 = h\upsilon_2 - W_0$

$e\,(V_2 - V_1) = h\,(\upsilon_2 - \upsilon_1)$

$V_2 = V_1 + \dfrac{h}{e}(\upsilon_2 - \upsilon_1)$

29) Form conservation of energy

$v^2 + \dfrac{-g\cancel{R}^2}{\cancel{R}} = \dfrac{-gR^2}{R+h}$

$\Rightarrow R + h = \dfrac{-gR^2}{\frac{v^2}{2} - gR} = \dfrac{2gR^2}{2gR - V^2}$

$\Rightarrow h = \dfrac{2gR^2}{2gR - v^2} - R$

$= \dfrac{\cancel{2g}R^2 - \cancel{2g}R^2 + v^2R}{2gR - v^2}$

$\Rightarrow h = \dfrac{R}{\left(\frac{2gR}{v^2} - 1\right)}$

30) Gravitational field at origin due to mass at '1'

$m = \dfrac{G(1)}{(1)^2} = G$

Gravitational field at origin due to mass at '2'

$m = \dfrac{G(1)}{(2)^2} = \dfrac{G}{4}$

Gravitational field at origin due to mass at '4'

$m = \dfrac{G(1)}{(4)^2} = \dfrac{G}{16}$------so on

Net Gravitational field at origin due to all masses

$\Rightarrow G + \frac{G}{4} + \frac{G}{16} + - - - - - - - - -\infty$

$\Rightarrow G\left[1 + \frac{1}{4} + \frac{1}{16} + - - - = \infty\right]$

$\Rightarrow G\left[\dfrac{1}{1-\frac{1}{4}}\right] = \dfrac{4G}{3}$

31) Given $V = \dfrac{V_e}{\sqrt{3}}$ comparing with $V = \dfrac{V_e}{n}$

$\therefore\ n = \sqrt{3}$

$h = \dfrac{R}{n^2-1} = \dfrac{R}{3-1} = \dfrac{R}{2}$

$V^2 = \dfrac{2gh}{1+\frac{h}{R}} = \dfrac{\cancel{2}\times g\times \frac{R}{\cancel{2}}}{1+\frac{\cancel{R}}{2\cancel{R}}}$

$= \dfrac{gR}{\frac{3}{2}} = \dfrac{2gR}{3}$

$\therefore V = \sqrt{\dfrac{2}{3}gR}$

32) $KE = \dfrac{hc}{\lambda}$

$\frac{1}{2}mv^2 = \dfrac{hc}{\lambda}$

$v^2 \propto \dfrac{1}{\lambda}$

$\dfrac{v_1}{v_2} = \sqrt{\left(\dfrac{\lambda_2}{\lambda_1}\right)} \Rightarrow \dfrac{v_1}{v_2} = \sqrt{\dfrac{4}{1}} = 2$

$\therefore\ v_2 = \frac{1}{2}$

33) When key is plugged between 2 and 1 ,

$V_1 = iR_1 = Xl_1 \rightarrow (1)$

When key is plugged between 3 and 1

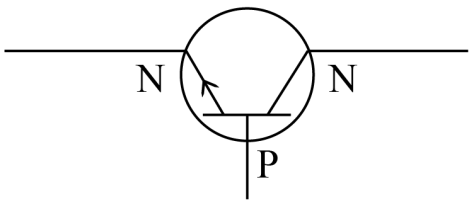
$V_2 = i\,(R_1 + R_2)$

$= Xl_2 \rightarrow (2)$

$\dfrac{(1)}{(2)} \Rightarrow \dfrac{R_1}{R_1+R_2} = \dfrac{l_1}{l_2}$

$\Rightarrow \dfrac{R_1}{R_2} = \dfrac{l_1}{l_2 - l_1}$

34) The arrow head in the transistor symbol always shows the direction of hole flow in the emitter region.



35)

$$da = \frac{1}{2}r^2 d\theta$$
$$\frac{dA}{dt} = \frac{1}{2}r^2\frac{d\theta}{dt}$$
$$\frac{dA}{dt} = \frac{1}{2}r^2\omega = \frac{L}{2m}$$
$$L = mr^2\omega$$

36)

$$V = \sqrt{\gamma P/\rho}$$
$$330 = \sqrt{\gamma \times \frac{1\times 10^5}{1.3}}$$
$$\frac{(330)^2 \times 1.3}{1\times 10^5} = \gamma$$
$$\frac{1.089\times 10^5 \times 1.3}{1\times 10^5} = \gamma$$
$$\frac{2}{f} + 1 = \gamma = 1.4 = 7/5$$
$$\frac{2}{f} = 2/5$$
$$f = 5$$

37) use verification method

$$\frac{1}{C^2}\left[G\frac{e^2}{4\pi\in_0}\right]^{\frac{1}{2}}$$
$$= \frac{1}{(LT^{-1})^2}\left[\frac{\overline{M^1}L^3T^{-2}\times(IT)^2}{\overline{M^1}L^{-3}T^4I^2}\right]^{\frac{1}{2}} = L = Length$$

38) According to Einstein's photoelectric equation

$$\frac{hc}{\lambda} = \phi + \frac{1}{2}mv^2 \Rightarrow v = \left[\frac{2(hc-\lambda\phi)}{m\lambda}\right]^{1/2}$$

39) In transistor, base is least doped.

40)

$$(v_{rms})_{He} = \tfrac{5}{7}(v_{rms})_H$$
$$\sqrt{\frac{3RT_{He}}{M_{He}}} = \frac{5}{7}\sqrt{\frac{3RT_H}{M_H}}$$
$$\frac{T_{He}}{4} = \frac{5\times 5}{7\times 7}\times\frac{273}{2}$$
$$T_{He} = \tfrac{50}{49}(273)\ nearly\ 0^0C$$
$$T_{He} = 0^0C$$

41)

$$I \propto \frac{1}{d^2}$$

42)

$$L = \frac{nh}{2\pi}$$
$$mvr = \frac{4h}{2\pi} \qquad \left[r = \frac{n^2}{z}r_0\right]$$
$$mv = \frac{2h}{\pi r}$$
$$\lambda = \frac{h}{mv} = \frac{\pi r}{2}n$$
$$= \frac{\pi\, 16r}{2}$$
$$\lambda = 8\pi r$$

43) Given

$\frac{x_1x_2}{x_1+x_2} = 3 \rightarrow (1)$

$x_1x_2 = 48$

$x_1 + x_2 = 16 \rightarrow (2)$

By verification $4\,\mu F$ and $12\,\mu F$ are correct.

44)

$$\beta = \frac{\Delta I_C}{\Delta I_B} = \frac{400-200}{10-5} = \frac{200}{5} = 40$$

45) $W_{A\rightarrow B}$ = area under AB graph

= 1 × 2

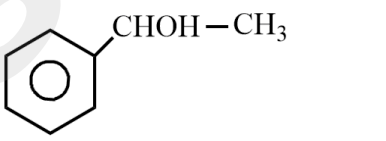
= 2J

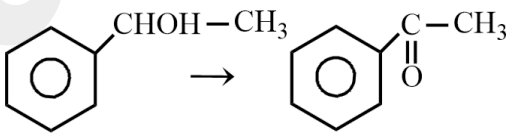
$W_{B\rightarrow C}$ = 0

$W_{C\rightarrow A} = \frac{1}{2}\times 1\times 2 + 1\times 2$

= 3 J

46) The reagent NaOI, NaOH suggests conditions of iodoform reaction. CHI_3 is an yellow solid with a characteristic odour. Only methyl ketones show iodoform reaction. A secondary alcohol which is oxidized to a methyl ketone, which is capable of showing iodoform reaction.





47) Two hydrogens have been removed. A secondary alcohol loses two hydrogens to become a ketone.

48) Max voltage =High R.P - Low R.P

=0.80 - (-0.76)

49) An insoluble patch of oil gets lifted up from a fabric by forming an emulsion with water which is then flushed a way.

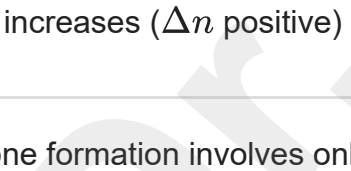
50) oxymercuration - demercuration, Hydroboration-oxidation does not involves rearrangements.

51) wt. of oxygen =wt. of oxide - wt. of copper
=5-4
=1

$$\frac{W_{Cu}}{W_0} = \frac{E_{Cu}}{E_0}$$
$$\frac{4}{1} = \frac{E_{Cu}}{8} \Rightarrow \ E_{Cu} = 32$$

52) We can see that CH_3MgI has become CH_3COOH by accepting one carbon. Option (1) and (3) give products with more than one carbon. Also $HCHO$ gives a primary alcohol. X must be CO_2.
O_2 adds to Grignard's reagent to yield acids.

$$CO_2 \xrightarrow{CH_3MgI} CH_3COOMgI \xrightarrow{H.OH}$$



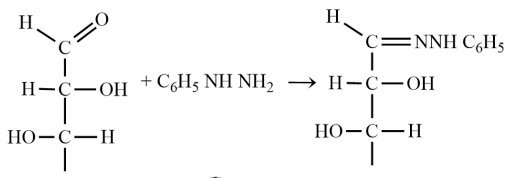
53) The nuclidic symbol of chlorine is ${}^{37}_{17}Cl$. Nucleons are the constituents of an atomic nucleus. The mass number of this species is 37, the mass number which is the sum of numbers of neutrons and protons.

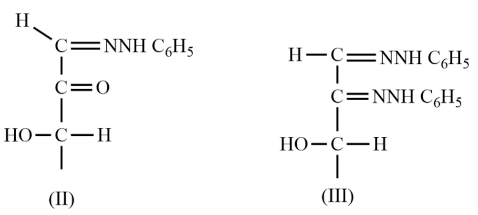
54) According to Le-chatelier principle when concentration of reactant increases, the equilibrium shift in favour of forward reaction.

55) It is obtained by addition of HCN on acetaldehyde

56) Increase in volume, i.e., decrease in pressure shifts the equilibrium in the direction in which number of moles increases (Δn positive)

57) Osazone formation involves only 2 carbon atoms of glucose because of
Each mole of glucose reacts with 3 moles of $C_6H_5NHNH_2$. The first molecule of phenylhydrazine condenses with aldehydic oxygen. (refer fig.I)
The second molecule of $C_6H_5NHNH_2$ oxidises the α -carbon to ketone. (refer fig.II)
The third molecule of $C_6H_5NNH_2$ condenses with the newly formed ketone. (refer fig. III)





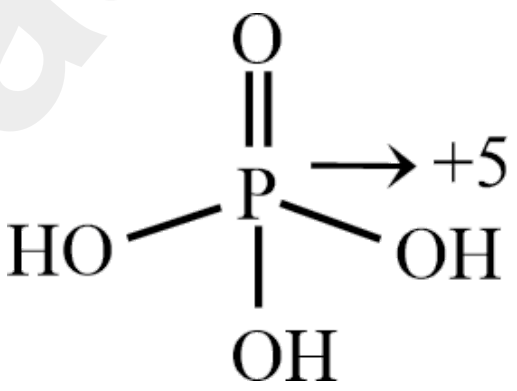
58) To prepare tertiary butyl methyl ether by williamson's synthesis, tert-butyl group should be taken in the form of alkoxide
$(CH_3)_3CONa + CH_3Cl \rightarrow (CH_3)_3C - O - CH_3 + NaCl$

59)
$$K = \frac{2.303}{t}\log\frac{a}{a-x}$$
$$t = t\frac{1}{2}\ a = \frac{a}{2}$$
$$= \frac{2.303}{t\frac{1}{2}}\log\frac{a}{a/2}$$
$$= \frac{2.303}{t\frac{1}{2}}\log 2$$
That is also
$$K = \ln\frac{2}{t_{1/2}}$$

60)
$$R = K[A]^a \ \rightarrow \ (1)$$
$$2R = K4^a[A]^a \ \rightarrow \ (2)$$
$$\frac{(2)}{(1)} = \frac{2\cancel{R}}{\cancel{R}} = \frac{\cancel{K}4^a\ \cancel{[A]^a}}{\cancel{K}\ \cancel{[A]^a}}$$
$$2 = 4^a$$
$$2^1 = 2^{2a}$$
$$a = \frac{1}{2}$$

61)
$$E_{cell} = \frac{-\Delta H}{nF} + T\left(\frac{\partial E_{cell}}{\partial T}\right)_P$$

62) In H_3PO_4 oxidation state of P is +5. It loses $5e^{\Theta}$.
So it has electronic configuration $1s^2\ 2s^2\ 2p^6$



63) Thermosetting of polymers contain strong covalent bonds between polymers in the form of three dimensional cross links. The structure becomes unreactive, rigid and insoluble in solvents.

(or)
Thermosetting polymers have a strong three dimensional network structure which is stabilized by covalent bonds of cross links. Hence they are hard, rigid and insoluble.

64) $Cr(H_2O)_6Cl_n$ if magnetic moment is 3.83 BM then it contain three unparied electrons. It means chromium in +3 oxidation state so molecular formula is $Cr(H_2O)_6Cl_3$

$\therefore$ This formula have following isomers

a) $\left[Cr(H_2O)_6\right]Cl_3$: react with $AgNO_3$ but does not show geometrical isomerism

b) $\left[Cr(H_2O)_5Cl\right]Cl_2.H_2O$ react with $AgNO_3$ but does not show geometrical isomerism

c) $\left[Cr(H_2O)_4Cl_2\right]Cl.2H_2O$ react with $AgNO_3$ and show geometrical isomerism

d) $\left[Cr(H_2O)_3Cl_3\right].3H_2O$ does not react with $AgNO_3$ and show geometrical isomerism

$\left[Cr(H_2O)_4Cl_2\right]Cl.2H_2O$ react with $AgNO_3$ and show geometrical isomerism and it's IUPAC nomenclature is Tetraaquadichlorido chromium (III) chloride dihydrate

65)

$Na_2\left[CrF_4O\right]$

$x+4(-1)+(-2)=-2$

$x-6=-2$

$x=+4$

66)

Dilution=$\frac{1000}{S}$

$\Lambda^{\infty}_{Agcl}=\lambda Ag^{\oplus}+\overset{\Theta}{\lambda cl}$

$=61.9+76.3=138.2\ mho\ cm^2\ mol^{-1}$

Sp. Conductivity $\times$dilution=$\Lambda_{\infty\ Agcl}=138.2$

$2.30\times10^{-6}\times\frac{1000}{S}=138.2 \quad S=1.66\times10^{-5}\ mole/Lit$

$S=1.66\times10^{-5}\times143.5 \qquad =2.382\times10^{-3}\ gr/L$

67)

$Cr_2O_7^{-2}\rightarrow Cr^{+3}$

$Cr_2O_7^{-2}\rightarrow 2Cr^{+3}$

$Cr_2O_7^{-2}\rightarrow 2Cr^{+3}+7H_2O$

$Cr_2O_7^{-2}+14H^{+}\rightarrow 2Cr^{+3}+7H_2O$

$Cr_2O_7^{-2}+14H^{+}+6e^{-}\rightarrow 2Cr^{+3}+7H_2O$

68) A gas shows maximum deviation from ideal gas at low temperature and high pressure. Temperature $\left[-100^0\ C\right]$ and 5 atm pressure.

69) Denaturation is the process of total change of the original secondary, tertiary and quaternary structures of a protein. This will deactivate the original properties of the protein.

70) It converts $-\overset{|}{C}=O$ group into $-CH_2$ group

$CH_3-\overset{O}{\overset{||}{C}}-CH_3+4\left[H\right]\xrightarrow[con.HCl]{Zn-Hg}CH_3-CH_2-CH_3+H_2O$

71) Kc is independent of initial concentration.

72) Both amylose and amylopectin are polymeric saccharides contains monomeric glucose units. Amylose is a linear polymer, soluble in water. Amylopectin is a highly branched polymer which is insoluble in water.

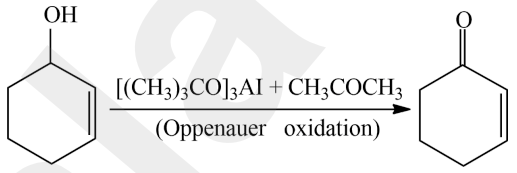
73) Due to its small size.

74) In the graph,

$\Delta H=y$

$E_b^a=y+x$

75) This is oppenauer oxidation of converting secondary alcohols to ketones without affecting other functional group in acetone medium



76) $K_{sp}=[As^{3+}]^2[S^{2-}]^2,$

$S=\sqrt[5]{\frac{K_{sp}}{108}}$

$=\sqrt[5]{\frac{2.8\times10^{-72}}{108}}=1.09\times10^{-15}$

77) (1) Benzene easily undergo substitution reactions than addition reactions.

(2) In Benzene all C - C bonds are equal i.e same.

(4) Benzene on mono substitution gives only one isomer.

78) Co-ordination isomerism is possible when both +ve and -ve ions of a salt are complex ions and the two isomers differ in the distribution of ligands in the cation and the anion.

79) CH_3COOH is the strongest acid, which can displace CO_2 from $NaHCO_3$ and also neutralize NaOH. C_2H_5OH does not react with NaOH nor $NaHCO_3$. CN^{-} is a strong base so that HCN is more acidic than H_2O. Hence the order is $CH_3COOH>HCN>H_2O>C_2H_5OH$

80) $MgCl_2 \rightarrow Mg^{+2} + 2Cl^-$

$95.3\,g \rightarrow 24.3$

$25.8\,g\,of\,MgCl_2 \leftarrow 6.6$

95.3g of $MgCl_2 \rightarrow$ 22.4 lit of chlorine

25.8 $mgCl_2 \rightarrow$?

$$\frac{25.8 \times 22.4}{95.3} = 6.06\,lit$$

(or)

95.3 gm of $MgCl_2$ will give 24.3 g of 'Mg' & 22.4 lit of chlorine my 6.6 g of Mg will give

= $$\frac{6.6 \times 22.4}{24.3} = 6.08\,lit$$

81) $K_4[Fe(CN)_6]$ is a complex salt. On ionisation it will dissociate in $4K^+$ and $[Fe(CN)_6]^{4-}$ ion. Hence, in $K_4[Fe(CN)_6]$ five ions are present.

82) If no.of moles of gaseous reactants=no.of moles of gaseous then there is no effect of pressure.

83) Gadolinium $\Rightarrow 63 \Rightarrow [Xe]\,4f^7 5d^1 6s^2$

84) $CH_3I + Na^{\oplus}O^{\Theta} - N = O \rightarrow$

$CH_3 - O - N = O + NaI$

$Methyl\ \ nitrite$

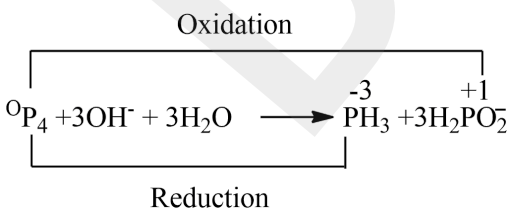
$(Major\ \ product)$

(or)

$CH_3I + NaNO_2 \rightarrow CH_3NO_2 + NaI$

85) The purpose of green chemistry is to find ways of avoiding the use of toxic chemicals. But CH_3NH_2 and CO combine to form the highly poisonous methyl isocyanate CH_3NCO.

86) The following is example of disproportionation reaction same element undergoes both oxidation and reduction in a redox reaction.



87) $\frac{w_1}{w_2} = \frac{1}{9}$

$\frac{12}{w_2} = \frac{1}{9}$

$(A.\ w\ of\ X)\ w_2 = 12 \times 9$

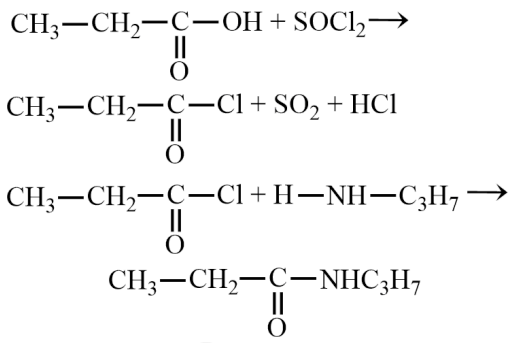
$M.w\ of\ X = A.\ w \times Atomicity$

$= 12 \times 9 \times 4$

=432

88) Ba, Mg and Ca are all fairly reactive and form oxides on their surface due to reaction with atmospheric oxygen and surface rapidly loses its shine. But beryllium is rather unreactive and does not react with air.

89) $SOCl_2$ converts a carboxylic acid into the acid chloride. Amide is formed when an acid chloride reacts with an amine.



90) Volume of unit cell $= a^3$

$= (3.04 \times 10^{-8} cm)^3 = 2.81 \times 10^{-23} cm^3$

91) AUG codon is having dual function ie as an initator codon and also codes for methionine

UGA is a stop codon 235 rRNA is found in the larger sub unit (505) of bacterical ribosome

28 srRNA is found in eukaryotic ribosome

94) In Poriferans there is no nerve cells & Senory cells. So There is no coordination among the parts of the body. Tissues are absent. They exhibit cell aggregated body pattern.

98) Capillary is the ability of a liquid to rise in a narrow space small diameter of tracheids and vessel elements increases capillarity.

99) Axillary position (A) is dominant over terminal (a) position. When $Aa \times Aa$ is crossed we get 3 : 1 ratio. Of axillary and terminal flowers.

101) UCU, UCC, UCA and UCG, all specify the amino acid serine.

104) The outer (cytosolic) face of the rough endoplasmic reticulum is studded with ribosomes that are the sites of protein synthesis. ... The smooth endoplasmic reticulum lacks ribosomes and functions in lipid manufacture and metabolism, the production of steroid hormones, and detoxification.

105) The beginnings of the Green Revolution are often attributed to Norman Borlaug, an American scientist interested in agriculture. In the 1940s, he began conducting research in Mexico and developed new disease resistance high-yield varieties of wheat.

106) It shown characters of both fishers and reptiles

107) These are generally have spermicidal effct (killing of sperms) so that these are used to improve (or) to increase their contraceptive effect

108) The influence of duration of light on the phenomenon of flowering is called photoperiodism. The light is perceived by a non photosynthetic pigment phytochrome present in leaves

115) Temperature is regulated by Hypothalamus.

118) Leaves, Flowers and Fruits are the organs of limited growth in plants

119) During the process of translation, 30's' ribosomal subunit associates with IF_1, IF_2, IF_3 initiation factors and GTP molecules, to form the complex which can bind with mRNA.

121) Tetanus occur due to infection by Clostridium tetany.

124) In the floral formula given Androecium (A) is indicated as O. It means the flower has no stamens therefore the flower is a incomplete one.

127) Notochord is present in the tail of larval stage in Ascidians.

130) During tissue culture, adventitious roots or shoots can be induced by transferring the callus to medium containing different ratios of auxin and cytokinin (2 : 1).

133) A. Haemophilia is a sex linked recessive gene dissorder or X - linked recessive diesease exhibits criss -cross pattern of inheritance
B. Down's syndrome is due to Autosomal trisomy or trisomy of 21^{st} pair of chromosome. $'2n+1'$ condition is called Aneuploidy. Aneuploidy is a condition of having feaser or extra chromosomes than the normal genome number of the species
C.Phenylketonuria is due to autosomal recessive gene found on chromosome 12
D. Sickle cell anaemia is Autosomal recessive genetic disorder and gene is found as chromosome II

134) The deficiency symptoms tend to appear first in the young tissues whenever the elements are relatively immobile and are not transported out of the mature organs, e.g., S and Ca.

137) Bacterial flagella are made up of a basal body, a Hook and a long filament.

138) They show dorsel tubular nerve form, notochord [stomochord] also called buccal diverticulum & Pharyngeal gill slits.

145) Nerve signals are recieved by dendrites and passed on to the cyton and to axon terminals.
Synapses ensures unidirectional flow of nerve signals.

146) The order of consumption of food material during starvation is
Carbohydrates $\rightarrow$ Fats $\rightarrow$ Proteins

147) Ovary- 2n, Anther-2n, Zygote-2n: Diploid Cells
Egg-n, Pollen-n, Male gamete-n: Haploid cells

152) Glucose and aminoacid are absorbed from lumen of illeum to mucosal epithelial cells of villi by secondary active transport by coupling with Na^+ ions.

154) Glycerol is a simple lipid which is trihydroxy propane

155) Phycobiont is the algal partner in lichen which prepare food for fungi

156) If testes are removed before maturity, the secondary sexual characteristics will not develop due to absence of male hormone testosterone. Such a condition is known as eunuchoidism.

157) Boron is needed in phloem translocation and pollen germination. Boron is required for uptake and utilisation of Ca2+, membrane functioning, pollen germination, cell elongation, cell differentiation and carbohydrate translocation.

158) Juxtaglomerular cells of the kidney secrete an enzyme renin, which converts angiotensinogen in liver into angiotensin-I, which is then converted into angiotensin-II. Thus, this renin-angiotensin pathway stimulates the adrenal cortex to produce aldosterone, which maintains Na+ and water concentration and controls the blood pressure by promoting Na^+ reabsorption.

160) Proinsulin is converted into the bioactive hormone insulin by removal of the C-peptide .

162) I (A) = When carpels are free on thalamus is called Apocarpous
II (B) = When carpels are fused on the thalamus is called Syncarpous

163) Pressure can be applied to the solution from the upper part of the funnel to prevent movement of water into it through an egg membrane. The pressure required to stop the movement of water completely is called osmotic pressure.

164) In the question mentioned organisms are belongs to phylum Arthropoda.
They contain jointed appendages & chitinous exoskeleton.

165) Regulator gene codes for repressor protein, promoter is the binding site for RNA polymerase, Operator is the sequence of DNA to which repressor protein bends, structural gene codes for a polypeptide.

166) Flatworms, liver fluke comes under platyhelminthes but pin worm comes under Aschelmenthes.

168) The dagger shaped teeth help in tearing are called canines.

173) Hyperthermophilic organism that grows in highly acidic habitat belongs to eubacteria and archaea group.

174) $\Rightarrow$ elongation of long bones is due to oversecretion of growth hormone after adolescence.

176) Long distance transport through xylem and phloem is called translocation mineral salts and water move ascending from root to leaves.

178) Cellulose, Starch, glycogen are homopolymer of glucose units
Hyaluronic corrosive is a heteropolymeric carbohydrate
Nucleic acids are polymers of nucleotides, so homopolymers only.
Proteins are composed of different types of amino acids, so heteropolymers only
Lipids always appear as monomers

179) Gastric juice does not contain any enzyme to digest carbohydrates.

180) The correct statements for 1,2, and 3 are as follows
1. DNA content becomes double during S-phase.
2. Duration of interphase is the longest phase as compared to Mphase
3. G2 phase follows the proper completion of S phase of the cell cycle.