Mock Test 6 (Physics Solution)

1 (C) : We know that, Energy of the particle is,

$E = \frac{1}{2} m\omega^2 A^2$

$= \frac{1}{2} m \left(\frac{2\pi}{T}\right)^2 A^2$

$= \frac{1}{2} \times \frac{4\pi^2}{T^2} mA^2$

$E = \frac{2\pi^2 mA^2}{T^2}$

∴ Total energy of particle is $\frac{2\pi^2 mA^2}{T^2}$.

2(D) : Given, pressure, $P_1 = P_2 = P$ Densities of gases are d_1 and d_2 We know that, $P_1 = \frac{1}{3} d_1 C_1^2$ And

$P_2 = \frac{1}{3} d_2 C_2^2$

$\because\ P_1 = P_2$

$\frac{1}{3} d_1 C_1^2 = \frac{1}{3} d_2 C_2^2\ \frac{d_1}{d_2} = \frac{C_2^2}{C_1^2}$

$\frac{1}{16} = \left(\frac{C_2}{C_1}\right)^2 \left(\frac{d_1}{d_2} = \frac{1}{16}\right)$

$\frac{C_1}{C_2} = \frac{4}{1}$

3 (C) : Given

$n = 1$ mole

$\Delta T = T_2 - T_1 = (150 - 0) = 150°C$

$R = 8.3 J/K.mol,\ \ C_P = 2.5R$

$C_P - C_V = R \Rightarrow C_V = C_P - R = 2.5R - R = 1.5R$

$dQ = dU + dW \Rightarrow dQ = dU\ (\because dW = 0)$

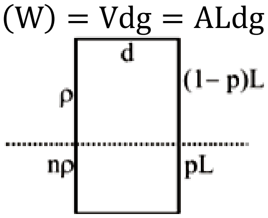
$dQ = nCC_V\Delta T$

$dQ = n1.5R\Delta T$

$dQ = 1 \times 1.5 \times 8.3 \times 150 = 1867.5J$

$dQ = 1867.5J$

4 (C) : Given that, Weight of the wooden block (W) = Vdg = ALdg



From the Archimedes principle, we know that-
Weight of wooden block = Upthrust due to liquid of density nρ + upthrust due to liquid density ρ

$ALdg\ \ = (pL)A(n\rho)g + (1 - p)LA\rho g$

$ALgd\ \ = ALg(n\rho p) + (1 - p)ALg\rho$

$d\ \ = (1 - p)\rho + pn\rho$

$d\ \ = \rho[1 + (n - 1)p]$

5 (C)

$\Delta l = \frac{Fl}{AY}$

$\text{area}(A) = \pi r^2$

$\Delta l_1 = \frac{mgl}{\pi r^2 Y}$

elongation in wire- 2 be $= \Delta l_2$

$\Delta l_2 = \frac{mg(2l)}{\pi(2r)^2 Y} = \frac{mgl}{2\pi r^2 Y}$

$(\Delta l)_{net} = \Delta l_1 + \Delta l_2$

$= \frac{mgl}{\pi r^2 Y} + \frac{mgl}{2\pi r^2 Y}$

$(\Delta l)_{net} = \Delta l_1 + \Delta l_2$

$= \frac{mgl}{\pi r^2 Y} + \frac{mgl}{2\pi r^2 Y}$

$= \frac{3mgl}{2\pi r^2 Y}$

6(D)

Diameters of earth $(d_e) = 1600km$

Radius of earth $(R_e) = \frac{1600}{2} = 800km$

Diameters of moon $(d_m) = 800km$

Radius of moon $(R_m) = \frac{800}{2} = 400km$

So, $R_e = 2R_m$

Acceleration due to gravity at earth $(g_e) = \frac{GM_e}{{R_e}^2}$ ...(i)

Acceleration due to gravity at moon(gm_m)

$g_m = \frac{GM_m}{{R_m}^2}$ ...(ii)

Dividing equation (ii) by (i), we get,

$\frac{g_m}{g_e} = \frac{M_m}{{R_m}^2} \times \frac{{R_e}^2}{M_e}$

$\frac{g_m}{g_e} = \frac{M_m \times (2R_m)^2}{(R_m)^2 \times 80M_m}$

$\frac{g_m}{g_e} = \frac{4}{80}$

$\frac{g_m}{g_e} = \frac{1}{20}$

$g_m = \frac{g_e}{20}$

$= \frac{g}{20}$

7 (D) : Given equation of EM wave is

$Ey = E_0 \sin(kx - \omega t)\hat{j}$

Since wave is travelling in x-direction & Electric field vector is in y - direction ∴ Direction of magnetic field vector will be in z − direction

i. e. C, E_0&B_0 are perpendicular to each other

$$\hat{i} \times \hat{j} = \hat{k}$$
$$B_z = B_0 \sin(kx - \omega t)\hat{k}$$
$$B_0 = \frac{E_0}{C}$$
$$\therefore B_z = \frac{E_0}{C}\sin(kx - \omega t)\hat{k}$$

8 (C) :

Given, Voltage, $E = 141\sin(628t)$ ...(A)

Standard equation of AC voltage,

$E = E_0 \sin(\omega t)$ ...(ii)

On comparing equation (i) and (ii),

$$E_0 = 141V$$
$$\omega = 628 rad/s$$

The rms value of voltage,

$$E_{ms} = \frac{E_0}{\sqrt{2}} = \frac{141}{\sqrt{2}} = \frac{141}{1.41} = 100V$$

And frequency,

$\omega = 2\pi f$

$628 = 2\pi \times f$

$$f = \frac{628}{2 \times 3.14} = \frac{628}{6.28} = 100Hz$$

9 (D) : Let current I passes through outer loop,

Then magnetic field, $B = \frac{\mu_0 I}{2R_1}$

And magnetic flux $(\phi) = BA = \frac{\mu_0 I}{2R_1}\pi R_2^2$

Mutual inductance, $M = \frac{\phi}{I} = \frac{\mu_0 \pi R_2^2}{2R_1}$

Hence, $M \propto \frac{R_2^2}{R_1}$

10 (B) : Given, radius of circle = 0.8m, time = 2sec

We know that, magnetic field (B) $= \frac{\mu_0}{4\pi}\frac{2\pi i}{r}$

$$B = \frac{\mu_0 i}{2r}$$

For helium nucleus, $q = it$

$$i = \frac{2e}{t} = \frac{2 \times 1.6 \times 10^{-19}}{2}$$

$i = 1.6 \times 10^{-19}A$

Putting the value of ' i ' in equation (i), we get -

$$B = \frac{\mu_0 \times 1.6 \times 10^{-19}}{2 \times .8}$$

$B = \mu_0 \times 10^{-19}T$

11 (D) : Given, Side of square conductor (a) = $2mm = 2 \times 10^{-3}m$

Length (l) = 12m

Resistance (R) = 0.072Ω

Area (A) $= a^2 = (2 \times 10^{-3})^2 = 4 \times 10^{-6}m^2$ We know that,

$$R = \frac{\rho l}{A}$$
$$\rho = \frac{RA}{l}$$
$$\rho = \frac{0.072 \times 4 \times 10^{-6}}{12}$$
$$\rho = 0.006 \times 4 \times 10^{-6}$$
$$\rho = 2.4 \times 10^{-8}\Omega m$$

12 (A)

From figure, Linear momentum is moving anti-clockwise direction and perpendicular to radius from point A towards +ve y-axis ($\hat{j}$). From right hand thumb Rule, Angular momentum $(\vec{L})$ is towards +ve z-axis $(L\hat{k})$ Now,

$$\vec{\alpha} = \vec{p} \times \vec{L}$$
$$\vec{\alpha} = (p\hat{j}) \times (L\hat{k})$$
$$= pL(\hat{j} \times \hat{k})$$
$$= pL\hat{i}$$

From properties of cross product of 2 vector, therefore the direction of α is +ve x-axis.

13 (A) : We know that,

The young's modulus is $(Y) = \frac{\text{Stress}}{\text{Strain}}$

$Y = \frac{F/A}{\Delta l/l}$ [∵ Strain is dimensionless]

$Y = N/m^2$, which is equal to unit of pressure.

14(B)

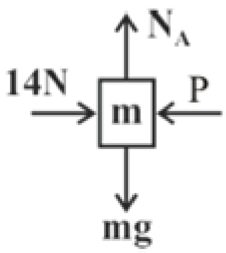
$m_A = 4kg$

$m_B = 2kg$

$m_C = 1kg$

$F = 14N$

Total mass (m) $= 4 + 2 + 1 = 7\text{kg}$
Using Newton's second law,
$F = ma$
$14 = 7a$
$a = 2\text{m/s}^2$
P be the force applied on block A by block B, FBD of block A,



From Newton's second law,
$14 - P = 4a$
$14 - P = 4 \times 2$
$P = 14 - 8$
$P = 6N$

15 (D) : We know,
Range $= u_s \times$ time of flight (T)
$$\frac{V_0^2 \sin 2\theta}{g} = V_0 \cos\theta \times T$$
$$T = \frac{V_0^2(2\sin\theta\cos\theta)}{g \times V_0\cos\theta}$$
Time of flight (T) $= \frac{2V_0 \sin\theta}{g}$

16(A)
$$V = \sqrt{V_R^2 + (V_L - V_c)^2}$$
$$= \sqrt{(40)^2 + (60-30)^2}$$
$$= 50 \text{ volt}$$

17 (C)
True power consumed (P) $= \frac{V_{rms}^2}{Z}\cos\phi$ Where,
$\cos\phi = \frac{R}{Z}$
$$P = \frac{V_{mus}^2}{Z} \times \frac{R}{Z}$$
$$= \frac{V_{mms}^2 \times R}{Z^2}$$
$$P = \frac{220 \times 220 \times 18}{33 \times 33}$$
$$P = 800W$$

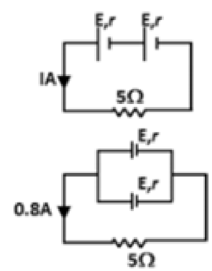
18(D) In an LCR series circuit, the capacitive and inductance reactance have opposing effects. So, the net reactance
$X = X_L - X_C$
And as we know, at resonance
$X_L = X_C$
Thus, net reactance (X) $= 0$.

19(A) $p + {}_3^7Li \rightarrow 2\,{}_2^4He$ hence x + 7 x 5.60 = 8 x 7.06 hence x =17.28 (remember value is per neucleon)

20 (B) : Ionization energy of H-atom in ground state, $E_1 = 13.6\text{eV}$ Energy of an H-atom in first excited state
$$= \frac{-13.6}{(2)^2} = 3.4eV$$

Hence, energy required to ionize an excited H-atom is equal to 3.4eV or greater than 3.4eV.

21(C)



$2E = 1(5 + 2r)$
$E = 0.8(5 + r/2)$ solving equation

$$5 + 2r = 1.6\left[5 + \frac{r}{2}\right]$$
$$r = \frac{3}{1.2} = 2.5\Omega$$

22 (D) :

23(B)
Electrostatic potential energy $U = \frac{CV^2}{2}$

$$\Rightarrow \frac{U}{(Ad)} = \frac{\varepsilon_0 E^2}{2}$$

Electrostatic energy per unit volume $\frac{1}{2}\epsilon_0 E^2$
Electrostatic energy density is $\propto E^2$

24 (B) Due to the charge inside a sphere of radius r only.

25(C)
The escape velocity on earth is given by:

$$V_e = \sqrt{\frac{2GM}{R}}$$

Mathematically orbital velocity is given by

$$\Rightarrow V_o = \sqrt{\frac{GM}{R}}$$

On dividing equation 1 and 2 , we get

$$\Rightarrow \frac{V_e}{V_o} = \sqrt{2}$$

Here, $V_e = 2$, so $V_0 = \sqrt{2}$

26(C)

Since, orbital velocity $v = \sqrt{\frac{GM}{r}}$ or $v \propto \frac{1}{\sqrt{r}}$

$$\frac{v_2}{v_1} = \sqrt{\frac{r_1}{r_2}}$$

$$\therefore v_2 = \sqrt{\frac{r_1}{r_2}} \cdot v = \sqrt{\frac{R}{R + \frac{R}{2}}} \cdot v = \sqrt{\frac{2}{3}} v.$$

27 (C)
Accordingly to law of equipartion of energy, energies equally distributed among its degree of freedom. Let transitional and rotaional degree of freedom be f_1 and f_2

$$\therefore \frac{K_T}{K_R} = \frac{3}{2} \text{ and } K_T + K_R = U$$

Hence the ratio of transitional to rotational degrees of freedom is 3.2 . Since transiational degrees of freedom is , the rotational degrees of freedom must be 2

$$\therefore \text{ Internal energy } (U) = 1 \times (f_1 + rf_2) = \frac{1}{2} RT$$

$$U = \frac{1 \times 5 \times 8.3 \times 100}{2} = U = 2075\text{J}$$

28(A) Will increase

$$T = 2\pi \sqrt{\frac{l}{g_{eff}}}$$

Here, $g_{eff} = g - \frac{qE}{m}$ hence period will increase.

29(B)

$$\text{Energy received } E = \frac{nhc}{\lambda}$$

$$\Rightarrow E = n\left(\frac{12409}{\lambda}\right) \text{eV}$$

$$\Rightarrow 10^{-7} = n \times \frac{12400}{5000} \times 1.6 \times 10^{-19}$$

$$\Rightarrow n = \frac{5}{12.4 \times 1.6} \times 10^{12} \Rightarrow n = 2.5 \times 10^{11}$$

30 (C)

31 (A)

$\vec{r} = 2\hat{\imath} + 4\hat{\jmath}$

$F = 1$ N (Makes an angle of $\theta = 60°$ with the positive

$$F_X = 1 \times \cos 60° = \frac{1}{2}$$

$$F_y = 1 \times \sin 60° = \frac{\sqrt{3}}{2}$$

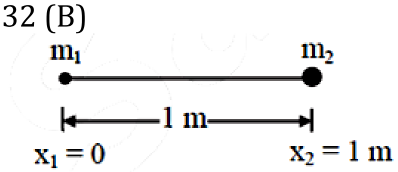
$$\vec{F} = \frac{1}{2}\hat{\imath} + \frac{\sqrt{3}}{2}\hat{\jmath}$$

$$\vec{\tau} = \vec{r} \times \vec{F}$$

$$\vec{\tau} = (2\hat{\imath} + 4\hat{\jmath}) \times \left(\frac{1}{2}\hat{\imath} + \frac{\sqrt{3}}{2}\hat{\jmath}\right)$$

$$\vec{\tau} = -0.27\hat{k}$$

32 (B)



Centre of mass from 5kg particle,

$$X_{cm} = \frac{m_1 x_1 + m_2 x_2}{m_1 + m_2}$$

$$= \frac{5(0) + 10(1)}{5 + 10} = \frac{10}{15} = \frac{2}{3} \text{m} \approx 67\text{cm}$$

33.(B)
In cyclic process ABCA

$Q_{cycle} = W_{cycle}$

$Q_{AB} + Q_{BC} + Q_{CA} =$ area of $\triangle$ ABC

$$+400 + 100 + Q_{C\to A} = \frac{1}{2}(2 \times 10^{-3})(4 \times 10^4)$$

$$\Rightarrow Q_{C\to A} = -460\text{J}$$

$$\Rightarrow Q_{A\to C} = +460\text{J}$$

34(D)
$y = \cos(500t - 70x)$
As y&x both are having units of displacement so it means the wave function is displacement of medium particles and particles of medium are oscillating but it is not mentioned that osicllation of medium particles is in which direction so wave can be transverse or longituadinal. The wave is propagating along positive X-axis with speed $V = \frac{50}{7}$ m/s frequency of wave is given by,

$2\pi f =: 500 \Rightarrow f = \frac{250}{\pi}$ Hz

The seperation between two closest point which are vibrating in phase are given by, $\Delta x = \lambda = \frac{50\times\pi}{7\times250} = \frac{\pi}{35}\text{m} = \frac{20\pi}{7}$cm. Work, energy and power

35(C)
In the collision of two bodies of masses m, and m, , velocity of the first mass after the collision is given by:

$$v_1 = \frac{m_1 - m_2}{m_1 + m_2}u_1 + \frac{2m_2}{m_1 + m_2}u_2 = \frac{(8-2)}{(8-2)}u_1 + 0$$

$$= \frac{6}{10}u_1 (\because u_2 = 0)$$

$$\therefore \frac{\text{KE after collision}}{\text{KE before collision (E)}} = \frac{\frac{1}{2}\times 8 \times v_1^2}{\frac{1}{2}\times 8\times u_1^2}$$

$$= \left[\frac{v_1}{u_1}\right]^2 = \left[\frac{6}{10}\right]^2 = \frac{36}{100} = 0.36$$

36(A) :
Let K and K ' be the maximum kinetic energy of photoelectrons for incident light of frequency v and 2v respectively. According to Einstein's photoelectric equation,
$K = hv - E_0$ ... (1)
and $K' = h(2v) - E_0$
$= hv + hv - E_0$
$= hv + K$ (using (A))
So,
$K' = hv + K$

37(D)
Electric energy dencity
$u_e = \frac{1}{2}\varepsilon_0\varepsilon^2\text{rms}$
$\text{Ems} = \frac{E_0}{\sqrt{2}}$

$\therefore u_e = \frac{1}{4}\varepsilon_0 E_0^2$

38(B)
Here $D = 9.0\text{m} = 900\text{cm}, d = 0.2\text{mm} = 0.02\text{cm}$
$\lambda = 5000 \times 10^{-8}\text{cm}$
Calculation:
$\therefore$ The width of central maximum $= 2w$

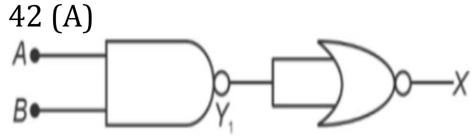
$$\beta_o = \frac{2D\lambda}{d} = \frac{2\times 900\times 5000\times 10^{-8}}{0.02}\text{cm}$$
$= 4.5$cm

39(C)
When V is doubled then using eV = ½ mv² we get v will be $\sqrt{2}v$ and F = qvB hence F will be $\sqrt{2}F$

40 (C) We know that when a bar magnet is placed in the magnetic field at an angle θ, then torque acting on the bar magnet
$(\tau) = MB\sin\theta = \vec{M}\times\vec{B}$.

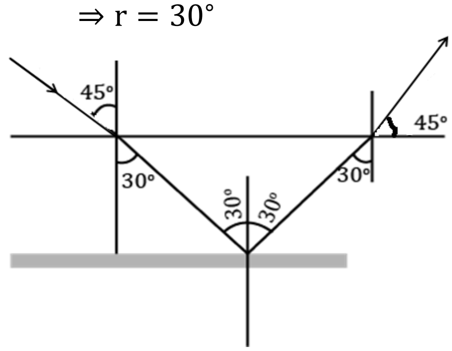
41(C) A → (3); (B) → (1); C → (4); (D) → (2)

42 (A)



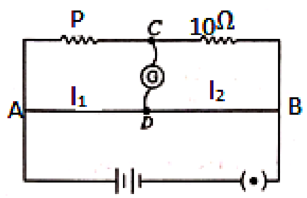
$Y_1 = \overline{A\cdot B}$
$X = \overline{Y_1 + Y_1} = \overline{Y_1}$
$X = \overline{\overline{A\cdot B}} = A\cdot B$

43(A)
According to Snell's law
$$\frac{\sin 45^\circ}{\sin r} = \sqrt{2}$$
$$\Rightarrow \sin r = \frac{1}{2}$$
$$\Rightarrow r = 30^\circ$$



Hence total deflection $=45^0-(-45^0)=90^\circ$
Hence correct option is (A).

44 (D)



$\frac{P}{10}=\frac{l_1}{l_2}$
$=\frac{3}{2}$

$P=\frac{30}{2}$
$=15\Omega$

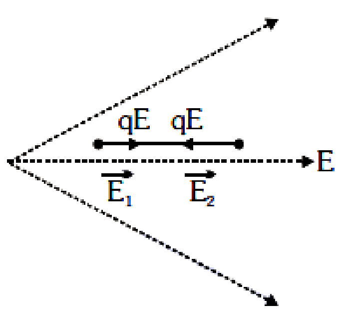
$R=\frac{pl}{A}$
$\frac{R_1}{R_2}=\frac{l_1}{l_2}$

Length of 15Ω resistance wire is 1.5 m

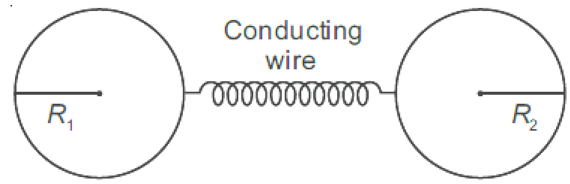
$\frac{15}{1}=\frac{1.5}{l_2}$
$l_2 = 0.1$ m

45(B)

46(C)
towards the right as its potential energy will decrease.
$|E_1|>|E_2|$ as field lines are closer at charge +q, so net force on the dipole acts towards right side.
A system always moves to decrease it's potential energy.



47(C)



When two conductors are connected by a conducting wire, then the two conductors should have same potential.
so, $V_1 = V_2$

$\frac{1}{4\pi\epsilon_0}\frac{Q_1}{R_1}=\frac{1}{4\pi\epsilon_0}\frac{Q_2}{R_2}$

$\frac{1}{4\pi\epsilon_0}\frac{Q_1}{R_1}\times\frac{R_1}{R_1}=\frac{1}{4\pi\epsilon_0}\frac{Q_2}{R_2}\times\frac{R_2}{R_2}$

$\frac{Q_1R_1}{4\pi R_1^2\epsilon_0}=\frac{Q_1R_1}{4\pi R_2^2\epsilon_0}$

$\frac{\sigma_1R_1}{\epsilon_0}=\frac{\sigma_2R_2}{\epsilon_0}$

$\frac{\sigma_1}{\sigma_2}=\frac{R_2}{R_1}$

48(B)
$F=\frac{KQ^2}{r^2}$
If 25 % of change of A transferred to B then,

$q_A = Q-\frac{Q}{4}$
$=\frac{3q}{4}$

$q_B = -Q-\frac{Q}{4}$
$=\frac{-3q}{4}$

$F_1=\frac{kq_Aq_B}{r^2}$

$F_1=\frac{k(\frac{3q}{4})^2}{r^2}$

$F_1=\frac{9}{16}\frac{KQ}{r^2}$

$F_1=\frac{9F}{16}$

49(A)

$T=\frac{2\pi R}{v}$

$v=\frac{2\pi R}{T}$ ...(A)

$H_{max}=\frac{v^2\pi^2R^2\sin^2\theta}{gT^2}=4R$

$\sin\theta=\left(\frac{2gT^2}{\pi^2R}\right)^{1/2}$

$\theta=\sin^{-1}\left(\frac{2gT^2}{\pi^2R}\right)^{1/2}$

50.(A)
Given
Mass(m) = .4 kg
Its frequency (n) = 2 rev/sec
Radius (r) = 1.2 m
We know that linear velocity of the body
$(v) = \omega r$
$= (2\pi n)r$
$=2 \times 3.14 \times 1.2 \times 2$
$= 15.08$ m/s

Therefore , tension in the string when the body is at the tip of the circle (T)
$= \frac{mv^2}{r} - mg$
$= \frac{0.4 \times (15.08)^2}{2} - (0.4 \times 9.8)$
= 45.78 -3.92
= 41.56N

CHEMISTRY (SECTION – A)

51.
Sol. (B)

$\because$ 180 gm glucose has = N molecules

$\therefore$ 5.23 gm glucose has = $\frac{5.23\times 6.023\times 10^{23}}{180}$

= 1.75 × 10^{22} molecules

52.
Solution: (c)

$\because$ 100 *ml* of air at STP contains 21 *ml* of O_2.

$\therefore$ 1000 *ml* of air at STP contains 210 *ml* of O_2.

$\therefore$ No. of moles of O_2 =

$\frac{\text{Vol. of } O_2 \text{ in litres under STP conditions}}{22.4 \text{ litre}}$ =

$\frac{210/1000}{22.4} = \frac{21}{2240}$ = 0.0093

53.
Solution : (a)

We know that velocity of electron in n^th Bohr's orbit is given by

$v = 2.18\times 10^6 \frac{Z}{n} m/s$

for $H, Z = 1$

$\because v_1 = \frac{2.18\times 10^6}{1} m/s$

$\because v_2 = \frac{2.18\times 10^6}{2} m/s = 1.09\times 10^6 m/s$

54.
Solution: (b)

55.
Solution: (c) $\Delta G = \Delta H - T\Delta S$

$\Delta H = 30.56 kJ\ mol^{-1}$; $\Delta S = 0.066\ kJmol^{-1} K^{-1}$;

$\Delta G = 0$ at equilibrium; $T = ?$

$\therefore \Delta H = T\Delta S$ or $30.56 = T\times 0.066$

$T = 463\ K$

56
Solution: (d)

$CH_2 = CH_2(g) + H_2(g) \longrightarrow H_3C - CH_3(g)$

$4E_{C-H} \Rightarrow 414\times 4 = 1656$ $6E_{C-H} \Rightarrow$

$414\times 6 = 2484$ $1\ E_{C=C} \Rightarrow 615\times 1 = 615$

$1E_{C-C} \Rightarrow 347\times 1 = 347$

$1E_{H-H} \Rightarrow 435\times 1 = 435$

$4\Delta H_{C-H} + \Delta H_{C=C} + \Delta H_{H-H} = 2706 \longrightarrow 6\Delta H_{C-H} + 1\Delta H_{C-C} = 2831$

$\Delta H = 2706 - 2831 = -125 kJ$

57.
Solution: (d)

$K_f = 1.1\times 10^{-2}$, $K_b = 1.5\times 10^{-3}$;

$K_c = \frac{K_f}{K_b} = \frac{1.1\times 10^{-2}}{1.5\times 10^{-3}} = 7.33$

58.
Solution: (a) $[H^+] = 5.5\times 10^{-3} mole/litre$

$pH = -\log[H^+]$

$pH = -\log[5.5\times 10^{-3}]$; $pH = 2.26$

59.
Solution: (a) Calculation of concentrations in *moles/litre*.

(i) Concentration of NH_4Cl = 53.5 *g/litre* $= \frac{53.5}{53.5}$ *moles/litre* $= 1$ *mole/litre*

(ii) $1N\ NH_4OH = 1M\ NH_4OH$, Substituting the values in the Henderson equation of the basic buffer.

$pOH = -\log K_b + \log\frac{[salt]}{[base]} =$

$-\log 1.8\times 10^{-5} + \log\frac{1}{1}$

= 4.7447 + 000 = 4.7447

Now since $pOH + pH = 14$

$pH = 14 - 4.74 = 9.26$

60.
Sol : A

61.

Solution: (a) $\frac{P_A^0 - P_A}{P_A^0} = \frac{n_B}{n_A}$; $\frac{143 - P_s}{143} = \frac{0.5/65}{158/154}$

or $P_s = 141.93\ mm$

62. Sol: (c)

63.
Solution (d)

$Q = I\times t = 2\times 193 = 386\ C$

$H_2O \rightarrow H_2 + \frac{1}{2}O_2$ *i.e.*, $O^{2-} \rightarrow \frac{1}{2}O_2 + 2e^-$

i.e., $2F = 2\times 96500$ gives

$O_2 = \frac{1}{2}$ *mole* =11200 *c.c.*

$\therefore$ 386 *c* will give

$O_2 = \frac{11200}{2\times 96500}\times 386 = 22.4\ c.c.$

64.
Solution: (a) $\Lambda_m^0 = 57 + 73 = 130\ S\ cm^2 mol^{-1}$.

65.
Solution: (b)

$$A_2(g) \rightarrow B(g) + \frac{1}{2}C(g)$$

$$100 \qquad 0 \qquad 0$$

$$100 - p \qquad p \qquad \frac{1}{2}p$$

$$100 - p + p + \frac{1}{2}p = 120 \text{ or } p = 40\,mm$$

$$\therefore -\frac{dp_{A_2}}{dt} = \frac{40}{5} = 8\,mm\ \text{min}^{-1}$$

66.
Solution: (c)

$$R = k[A]^n\text{; Also, } 100R = k[10\,A]^n\text{;}$$

$$\frac{1}{100} = \left[\frac{1}{10}\right]^n\text{; } \therefore n = 2$$

67.
Sol: (b)

68. Sol: (c)

69. Sol: (b)

70.
Sol: (c)

71.
Sol: (d)

72.
Sol: (c)

73.
Sol: (c)

74.
Sol: (d)

75.
Sol: (c)

76.
Sol: (c)

77.
Sol: (a)

78.
Sol: (d)

79.
Sol: (c)

80.
Sol. (C)

The IUPAC name of the given compound is 2-formyl butanedial $\overset{4}{\text{O=CH}}\text{–}\overset{3}{\text{CH}_2}\text{–}\overset{2}{\text{CH}}(\text{CHO})\text{–}\overset{1}{\text{CHO}}$ 2 - formyl butanedial

The principal functional group is – CHO.

81.
Sol: (d)

82.
Sol: (a)

83.
Sol: (a)

84.
Sol: (b)

85.
Sol: (c)

SECTION – B (Attempt any 10 questions)

86.
Sol: (a)

87.
Sol: (a)

88.
Sol: (a)

89.
Sol: (c)

90.
Sol: (a)

91.
Sol: (c)

92.
Sol: (a)

93. In the following reaction :
Sol: (b)

94.
Sol: (c)

95.
Sol: (a)

96.
Sol: (b)

97.
Sol: (a)

98.
Sol: (c)

99.
Sol: (c)

100.
Sol: (a)