RJ VISION PVT. LTD.

(MOST STABLE & INNOVATIVE INSTITUTE)

FT – 8

ENG

PCB SOLUTION

COURSE NAME: 12^{TH}

DATE : 10-06-2026

FT - 8 (FR) (NEET - CBSE, GSEB) (10 - 06 - 2026)

ANSWER KEY

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

PHYSICS:

1. **Sol. (1)**

$t = \sqrt{x} + 3 \Rightarrow x = (t - 3)^2$

Differentiation the relation

$$v = \frac{dx}{dt} = 2(t-3)$$

v = 0 at t = 3

$\therefore$ $x_{t=3} = (3-3)^2 = 0$

2. **Sol. (1)**

$$S = ut + \frac{1}{2}gt^2$$

$30 = -25t + \frac{10}{2}t^2$ or $t^2 - 5t - 6 = 0$

or $(t-6)(t+1) = 0$ (take positive root)

$\therefore$ t = 6 sec

3. **Sol. (3)**

$$R = \frac{u^2 \sin 2\theta}{g} = \frac{u^2 \sin 30^o}{g} = \frac{u^2}{2g}$$

($\because$ θ = 15 ° in the first case)

For maximum range θ = 45°

$$R' = \frac{u^2 \sin 2\times 45^o}{g} = \frac{u^2}{g}\sin 90^o$$

$$= \frac{u^2}{g} = 2R = 2\times 1.5\,km = 3km$$

4. **Sol. (3)**

$f_r \le f_L$

Since, mg sin 30° ≤ μmg cos 30°

The block has a tendency to slip downwards. Let F be the minimum force applied on it, so that it does not slip. Then

N = F + mg cos 30°

$\therefore$ mg sin 30° = μN = μ(F + mg cos 30°)

or $F = \frac{mg\sin 30^o}{\mu}$ – mg cos 30°

$$= \frac{(2)(10)(1/2)}{0.5} - (2)(10)\left[\frac{\sqrt{3}}{2}\right]$$

or F = 20 – 17.32 or F = 2.68 N

5. **Sol. (4)**

Decrease in gravitational potential energy = increase in elastic potential energy

$\therefore$ mg (h + x) = $\frac{1}{2}$ Kx^2

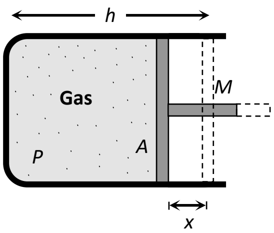
$\Rightarrow$ 2 × 9.8 (0.4 + x) = $\frac{1}{2}$ 1960 x^2

$\Rightarrow$ (0.4 + x) = 50 x^2 $\Rightarrow$ x = 0.1 m

6. **Sol. (4)**

$$\overrightarrow{R_{cm}} = \frac{A_1\vec{r_1} - A_2\vec{r_2}}{A_1 - A_2} = \frac{4m \times 0 - m \times \frac{a}{2}}{4m - m} = -\frac{a}{6}$$

7. **Sol. (1)**



Let the piston be displaced through distance x towards left, then volume decreases, pressure increases. If ΔP is increase in pressure and ΔV is decrease in volume, then considering the process to take place gradually (i.e. isothermal)

$P_1V_1 = P_2V_2 \Rightarrow PV = (P + \Delta P)(V - \Delta V)$

$\Rightarrow PV = PV + \Delta PV - P\Delta V - \Delta P\Delta V$

$\Rightarrow \Delta P.V - P.\Delta V = 0$ (Neglecting $\Delta P.\Delta V$)

$\Delta P(Ah) = P(Ax) \Rightarrow \Delta P = \frac{P.x}{h}$

This excess pressure is responsible for providing the restoring force (F) to the piston of mass M.

Hence $F = \Delta P.A = \frac{PAx}{h}$

Comparing it with $|F| = kx \Rightarrow k = M\omega^2 = \frac{PA}{h}$

$\Rightarrow \omega = \sqrt{\frac{PA}{Mh}} \Rightarrow T = 2\pi\sqrt{\frac{Mh}{PA}}$

Short rick : by checking the options dimensionally. Option (1) is correct.

8. **Sol. (2)**

Work done = increase in gravitational potential energy

$$\therefore \quad W_1 = \frac{mgR}{1+\frac{R}{R}} = \frac{mgR}{2} \qquad \left(\Delta U = \frac{mgh}{1+\frac{h}{R}}\right)$$

and $W_2 = \dfrac{mgh}{1+\frac{h}{R}}$

Given that $W_1 = 2W_2$

Or $\dfrac{mgR}{2} = \dfrac{2mgh}{1+\frac{h}{R}}$

or $h = \dfrac{R}{3}$

9. **Sol. (4)**

$$F \propto \frac{1}{R^{5/2}} \Rightarrow F = \frac{GMm}{R^{5/2}} = m\omega^2 R$$

$$\frac{GMm}{R^{5/2}} = m\left(\frac{2\pi}{T}\right)^2 R$$

$T^2 \propto R^{7/2} \Rightarrow T \propto R^{7/4}$

10. **Sol. (4)**

$x = Ay + B\tan Cz$

From the dimensional homogenity

$[x] = [Ay] = [B] \Rightarrow \left[\frac{x}{A}\right] = [y] = \left[\frac{B}{A}\right]$

$[Cz] = [M^0L^0T^0]$ = Dimension less

x and B; C and Z^{-1}; y and $\frac{B}{A}$ have the same dimension but x and A have the different dimensions.

11. **Sol. (3)**

From the given VT diagram,

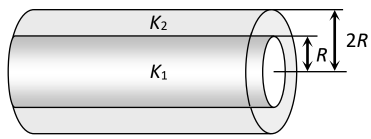
In process AB, $V \propto T \Rightarrow$ Pressure is constant (As quantity of the gas remains same)

In process BC, V = Constant and in process CA, T = constant

$\therefore$ These processes are correctly represented on PV diagram by graph (3).

12. **Sol. (3)**

Both the cylinders are in parallel, for the heat flow from one end as shown.



Hence $K_{eq} = \dfrac{K_1A_1 + K_2A_2}{A_1 + A_2}$; where A_1 = Area of cross-section of inner cylinder = πR^2 and A_2 =

Area of cross-section of cylindrical shell

$$= \pi\{(2R)^2 - (R)^2\} = 3\pi R^2$$

$$\Rightarrow K_{eq} = \frac{K_1(\pi R^2) + K_2(3\pi R^2)}{\pi R^2 + 3\pi R^2} = \frac{K_1 + 3K_2}{4}$$

13. Sol. (4)

Formula $\frac{T'}{T} = \sqrt{\frac{\rho}{\rho - \sigma}}$

Here $\sigma = 1$ for water so, $T' = T\sqrt{\frac{\rho}{\rho - 1}}$.

14. Sol. (4)

As we know that;

i. Source of microwave frequency is magnetron valve

ii. Source of infrared frequency is vibration of atoms and molecules.

iii. Source of gamma ray is radioactive decay of nucleus.

iv. Source of X-ray is transition of electron in inner shells.

15. Sol. (3)

$$y = a + bt + ct^2 - dt^4$$

$$\therefore v = \frac{dy}{dt} = b + 2ct - 4dt^3 \text{ and}$$

$$a = \frac{dv}{dt} = 2c - 12dt^2$$

Hence, at t = 0, v initial = b and a initial = 2c.

16. Sol. (4)

When pulse is reflected from a rigid support, the pulse is inverted both lengthwise and sidewise

17. Sol. (1)

The standard differential equation is satisfied by only the function $\sin\omega t - \cos\omega t$.

Hence it represents S.H.M.

18. Sol. (2)

W = Pt

By work-energy theorem,

$\frac{1}{2}mv^2 = Pt$ or $v \propto t^{1/2}$

$$\frac{ds}{dt} = kt^{1/2} \Rightarrow s = k\int t^{1/2}dt$$

$$s = kt^{3/2} \Rightarrow s \propto t^{3/2}$$

19. Sol. (2)

$$v = \sqrt{5gr} \therefore v \propto \sqrt{r}$$

So $\frac{v_2}{v_1} = \sqrt{\frac{r_2}{r_1}} = \sqrt{\frac{r/4}{r}} = \frac{1}{2}$

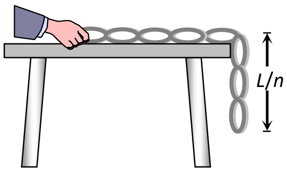
$$\Rightarrow v_2 = v/2$$

20. Sol. (2)

Fraction of length of the chain hanging from the table

$$= \frac{1}{n} = \frac{60\,cm}{200\,cm} = \frac{3}{10} \Rightarrow n = \frac{10}{3}$$

Work done in pulling the chain on the table



$$W = \frac{mgL}{2n^2}$$

$$= \frac{4 \times 10 \times 2}{2 \times (10/3)^2} = 3.6J$$

21. Sol. (2)

$$dV = -\vec{E}.d\vec{r}$$

$$V_B - V_A = -\vec{E}.(\vec{r}_B - \vec{r}_A)$$

$$= -(20\hat{i})[2\hat{i} + 3\hat{j}]$$

= – 40volt

22. Sol. (3)

Two positive ions each carrying a charge q are kept at a distance d, then it is found that force of repulsion between them is –

$$F = \frac{kqq}{d^2} = \frac{1}{4\pi\varepsilon_0}\frac{qq}{d^2}$$

Where q = ne

$$\therefore F = \frac{1}{4\pi\varepsilon_0}\frac{n^2e^2}{d^2}$$

$$\Rightarrow n = \sqrt{\frac{4\pi\varepsilon_0 Fd^2}{e^2}}$$

23. Sol. (2)

When the key is kept open, the charge drawn from the source is

Q = C_{eq}V = $\frac{C}{2}$V

When the key is closed the capacitor 2 gets short circuited

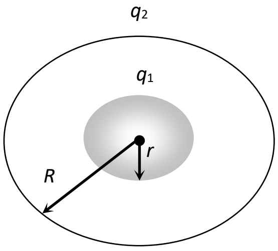
And C'_{eq} = C

$\therefore Q' = CV$

charge flown through cell $Q' - Q = \frac{C}{2}V$

$\therefore$ (b) is correct choice.

24. **Sol. (4)**



If q_1 and q_2 are the charges on spheres of radius r and R respectively, in accordance with conservation of charge

$Q = q_1 + q_2$ …. (i)

and according to the given problem $\sigma_1 = \sigma_2$

i.e., $\frac{q_1}{4\pi r^2} = \frac{q_2}{4\pi R^2} \Rightarrow \frac{q_1}{q_2} = \frac{r^2}{R^2}$ …. (ii)

So equation (i) and (ii) gives $q_1 = \frac{Qr^2}{(R^2+r^2)}$ and

$q_2 = \frac{QR^2}{(R^2+r^2)}$

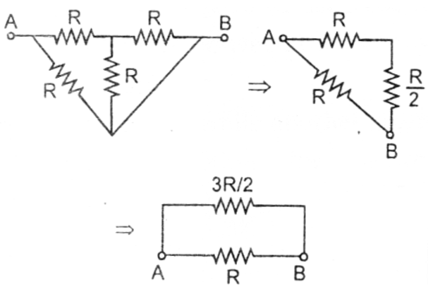
Potential at common centre

$$V = \frac{1}{4\pi\varepsilon_0}\left[\frac{q_1}{r} + \frac{q_2}{R}\right]$$

$$= \frac{1}{4\pi\varepsilon_0}\left[\frac{Qr}{(R^2+r^2)} + \frac{QR}{(R^2+r^2)}\right] = \frac{1}{4\pi\varepsilon_0}.\frac{Q(R+r)}{(R^2+r^2)}$$

25. **Sol. (4)**

The circuit can be redrawn as



and Finally $R_{AB} = \frac{3}{5}R$

26. **Sol. (2)**

Mean radius, $r_m = \frac{0.25+0.26}{2} = 25.5\times10^{-2}\,m$

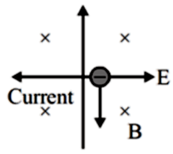
$$n = \frac{N}{2\pi r_m} = \frac{3500}{2\pi\times25.5\times10^{-2}}$$

Magnetic field of a toroid

$$B = \mu_0 nI = 4\pi\times10^{-7}\times\frac{3500}{2\pi\times25.5\times10^{-2}}\times11$$

$= 3 \times 10^{-2}$ T

27. **Sol. (4)**



If an electron is travelling horizontally towards East and magnetic field in vertically downward, then according to left hand rule. So, force on electron is towards South.

28. **Sol. (1)**

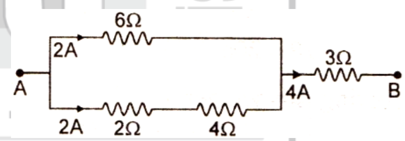
Magnetic intensity is define by $H = \frac{B}{\mu_0} - I$

29. **Sol. (1)**

$$N\phi = Li \Rightarrow \phi = \frac{Li}{N} = \frac{8\times10^{-3}\times5\times10^{-3}}{400} = 10^{-7} = \frac{\mu_0}{4\pi}wb$$

30. **Sol.(3)**

Steady state circuit is shown in figure:



$V_{AB} = (6\times2) + (3\times4)$

= 24 volt

31. **Sol. (4)**

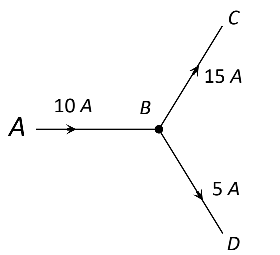
The voltage V_L and V_C are equal and opposite so voltmeter reading will be zero.

Also $R = 30\,\Omega,\ X_L = X_C = 25\Omega$

So $i = \frac{V}{\sqrt{R^2+(X_L-X_C)^2}} = \frac{V}{R} = \frac{240}{30} = 8\,A$

32. **Sol. (1)**

Yes, in AC if branch AB has R, BC has a capacitor C, and BD has a pure inductance L



33. **Sol. (3)**

Intensity at distance r from a point source

$I = \frac{P}{4\pi r^2}$

Efficiency $\eta = \frac{output}{input} = \frac{P}{P'}$

$P = \eta P' = \left(\frac{10}{100}\right)(30\pi) = 3\pi W$

$I = \frac{P}{4\pi r^2} = \frac{3\pi}{4\pi(3)^2} = \frac{1}{12}\frac{W}{m^2}$

$= \frac{1}{2}\epsilon_0 E_0^2 c$

$\frac{1}{12} = \frac{1}{2}\epsilon_0 E_0^2 \times 3\times 10^8$

$E_0^2 = \frac{10^{-8}}{18\epsilon_0} = \frac{10^{-8}}{18\times 8.85\times 10^{-12}} = \frac{10^4}{18\times 8.85}$

$E_0 = \frac{100}{\sqrt{18\times 8.85}} = 2.66 V/m$

$B_0 = \frac{E_0}{c} = \frac{2.66}{3\times 10^8} = 0.88\times 10^{-8} T$

34. **Sol. (4)**

f = –60, m = –5

u = ?

$m = \frac{f}{f-u}$

$-5 = \frac{-60}{-60-u}$

$\Rightarrow$ u = – 72 cm

35. **Sol. (3)**

By using $O = \sqrt{I_1 I_2}$

$\Rightarrow \; O = \sqrt{8\times 2} = 4\,cm$

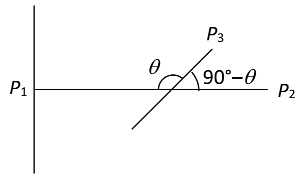
36. **Sol.(1)**

$\theta = \frac{\lambda}{d}; \theta$ can be increased by increasing λ, so here λ has to be increased by 10%

i.e., % Increase $= \frac{10}{100}\times 5890 = 589 Å$

37. **Sol. (1)**

No light is emitted from the second polaroid, so P_1 and P_2 are perpendicular to each other



Let the initial intensity of light is I_0. So Intensity of light after transmission from first polaroid = $\frac{I_0}{2}$.

Intensity of light emitted from P_3 $\quad I_1 = \frac{I_0}{2}\cos^2\theta$

Intensity of light transmitted from last polaroid i.e. from $P_2 = I_1\cos^2(90^o - \theta) = \frac{I_0}{2}\cos^2\theta.\sin^2\theta$

$= \frac{I_0}{8}(2\sin\theta\cos\theta)^2 = \frac{I_0}{8}\sin^2 2\theta$.

38. **Sol. (4)**

$\because V_0 = \left(\frac{h}{e}\right)v - \left(\frac{W_0}{e}\right)$. From the graph V2 > V1

$\Rightarrow \frac{hv_2}{e} - \frac{W_0}{e} > \frac{hv_1}{e} - \frac{W_0}{e} \Rightarrow v_2 > v_1$

$\Rightarrow \lambda_1 > \lambda_2\left(as\lambda \propto \frac{1}{v}\right)$

39. **Sol. (4)**

From $E = W_0 + \frac{1}{2}mv_{max}^2$

$\Rightarrow 2hv_0 = hv_0 + \frac{1}{2}mv_1^2 \Rightarrow hv_0 = \frac{1}{2}mv_1^2$ ... (i)

and $5hv_0 = hv_0 + \frac{1}{2}mv_2^2 \Rightarrow 4hv_0 = \frac{1}{2}mv_2^2$

... (ii)

Dividing equation (ii) by (i) $\left(\frac{v_2}{v_1}\right)^2 = \frac{4}{1}$

$\Rightarrow v_2 = 2v_1 = 2\times 4\times 10^6 = 8\times 10^6 m/s$

40. **Sol. (1)**

For hydrogen and hydrogen like atoms

$E_n = -13.6\frac{z^2}{n^2}eV$

$U_n = 2E_n = -27.2\frac{z^2}{n^2}eV$ and $K_n = |E_n| = 13.6\frac{z^2}{n^2}eV$

From these three relations we can see that as *n* decreases, K_n will increase but E_n and U_n will decreases.

41. **Sol. (3)**

In hydrogen atom $E_n = -\frac{Rhc}{n^2}$

Also $E_n \propto m$; where *m* is the mass of the electron.

Here the electron has been replaced by a particle whose mass is double of an electron. Therefore, for this hypothetical atom energy in n^{th} orbit will be given by $E_n = -\frac{2Rhc}{n^2}$

The longest wavelength λ_{max} (or minimum energy) photon will correspond to the transition of particle from *n* = 3 to *n* = 2 ⇒ $\frac{hc}{\lambda_{max}} = E_3 - E_2 = Rhc\left(\frac{1}{2^2} - \frac{1}{3^2}\right)$

This gives $\lambda_{max} = \frac{18}{5R}$.

42. Sol. (1)

Let the percentage of B^{10} atoms be x, then Average atomic weight

$$= \frac{10x + 11(100 - x)}{100} = 10.81$$

$$\Rightarrow x = 19 \quad \therefore \frac{N_{B^{10}}}{N_{B^{11}}} = \frac{19}{81}$$

43. Sol. (3)

Because in case of metallic sphere either solid or hollow, the charge will reside on the surface of the sphere. Since both spheres have same surface area, so they can hold equal maximum charge.

44. Sol. (1)

$$B = \mu_0 ni \Rightarrow i = \frac{B}{\mu_0 n} = \frac{20 \times 10^{-3}}{4\pi \times 10^{-7} \times 20 \times 100}$$

$$= 7.9\ amp = 8\ amp$$

45. Sol. (2)

Energy of incident photon, $E = \frac{hc}{\lambda}$

$$= \frac{6.6 \times 10^{-34} \times 3 \times 10^8}{6 \times 10^{-7} \times 1.6 \times 10^{-19}} = 2.06 eV$$

This incident radiation can be detected by a photodiode if energy of incident photon is greater than the band gap.

As, D_2 = 2 eV

∴ D_2 will detect these radiation.

CHEMISTRY:

46. **Sol.(2)**

47. **Sol.(3)**

48. **Sol.(1)**

$$\begin{array}{llllll} & CO + H_2O & \rightleftharpoons & CO + H_2 & & x + x = 0.8 \\ t=0 & 1 \quad 1 & & 0 \quad 0 & & 2x = 0.8 \\ t=t_{eq} & 1-x \quad 1-x & & x \quad x & & x = 0.4 \end{array}$$

49. **Sol.(3)**

$H_2O(l) \rightleftharpoons H_2O(g)$

liquid vapour

$\Delta S > 0$

$\Delta H > 0$

$\Delta G = 0$

$\Delta S_{Total} = 0$

50. **Sol.(4)**

51. **Sol.(1)**

Spherical nodes $= n - \ell - 1$

Angular nodes $= \ell$

Total nodes $= n - \ell - 1 + \ell$

$= (n - 1)$

52. **Sol.(1)**

53. **Sol.(2)**

54. **Sol.(4)**

55. **Sol.(2)**

56. **Sol.(1)**

57. **Sol.(2)**

$\propto = \dfrac{\Lambda_m^C}{\Lambda_m^\infty} = \dfrac{80}{400}$

$\propto = 0.2$

$K_a = \dfrac{C\propto^2}{1-\propto} = \dfrac{0.1 \times (0.2)^2}{1-0.2}$

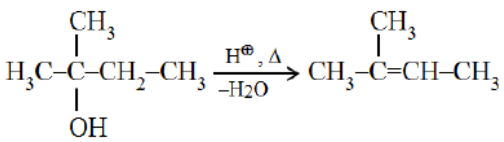
$K_a = 5 \times 10^{-3}$

58. **Sol.(3)**

59. **Sol.(2)**

60. **Sol.(2)**

61. **Sol.(2)**



62. **Sol.(2)**

$\propto = \sqrt{\dfrac{K_a}{C}}$; on dilution, $C \downarrow, \propto \uparrow$

63. **Sol.(2)**

64. **Sol.(1)**

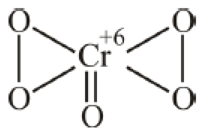
$CH_3CH_2CH{=}CH_2 + HBr \xrightarrow[\text{(AMK Rule)}]{H_2O_2} CH_3CH_2CH_2CH_2Br$

65. **Sol.(1)**

Chlorophyll	–	Magnesium
Blood Pigment	–	Iron
Wilkinson catalyst	–	Rhodium
Vitamin B_{12}	–	Cobalt

66. **Sol.(3)**

CrO_5



67. **Sol.(4)**

68. **Sol.(3)**

69. **Sol.(2)**

70. **Sol.(4)**

71. **Sol.(4)**

$AgNO_3 \xrightarrow{\Delta} AgO + \underset{\text{Brown fumes}}{NO_2}$

$AgNO_3 + KI \rightarrow \underset{\text{Yellow ppt.}}{AgI} + KNO_3$

$AgNO_3 + BaCl_2 \rightarrow \underset{\text{White ppt.}}{AgCl} + Ba(NO_3)_2$

72. **Sol.(2)**

$Na_2S + \text{dil } H_2SO_4 \longrightarrow H_2S \text{ gas} \xrightarrow{Pb(CH_3COO)_2} PbS \text{ (Black)}$

73. **Sol.(4)**

74. **Sol.(4)**

75. **Sol.(2)**

76. **Sol.(4)**

When, $Q = K_C$, the reaction is at equilibrium,

So, $E_{cell} = 0$

77. **Sol.(2)**

78. **Sol.(4)**

$$\boxed{v \propto \frac{Z}{n}}$$

79. **Sol.(1)**

80. **Sol.(4)**

81. **Sol.(2)**

$$CH_3-\overset{\overset{\large O}{\|}}{C}-CH_3 \xrightarrow[\Delta]{\text{dil NaOH}} CH_3-\underset{\underset{\large CH_3}{|}}{C}=CH-\overset{\overset{\large O}{\|}}{C}-CH_3$$

82. **Sol.(1)**

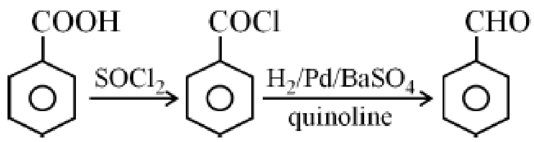
83. **Sol.(3)**

84. **Sol.(4)**

85. **Sol.(2)**

86. **Sol.(2)**

87. **Sol.(4)**



88. **Sol.(3)**

$$As_2S_3 + NO_3^{-} + H^{+} \longrightarrow AsO_4^{3-} + SO_4^{2-} + NH_3 + H_2O$$

The total no of electrons lost by

$As_2S_3 = 2 \times 2 + 3 \times 8 = 28$

So, v.f. of $As_2S_3 = 28$ therefore, $E = MM/28$

89. **Sol.(3)**

90. **Sol.(1)**