PACE-IIT & MEDICAL

ANDHERI / BORIVALI / DADAR / CHEMBUR / THANE / NERUL / KHARGHAR / POWAI

MOCK TEST - 4 -(NEET 2019 Aspirants) - Solutions

1. (1) Dimension of $\alpha t = [M^0L^0T^0] \therefore [\alpha] = [T^{-1}]$

Again $\left[\frac{v_0}{\alpha}\right] = [L]$ so $[v_0] = [LT^{-1}]$

2. (2) Let car *B* catches, car A after '*t*' sec, then

$60t + 2.5 = 70t - \frac{1}{2} \times 20 \times t^2$

$\Rightarrow 10t^2 - 10t + 2.5 = 0 \Rightarrow t^2 - t + 0.25 = 0$

$\therefore t = \frac{1 \pm \sqrt{1 - 4 \times (0.25)}}{2} = \frac{1}{2} hr$

3. (3) For first projectile, $h_1 = ut - \frac{1}{2} gt^2$

For second projectile, $h_2 = u(t - T) - \frac{1}{2} g(t - T)^2$

When both meet *i.e.* $h_1 = h_2$

$ut - \frac{1}{2} gt^2 = u(t - T) - \frac{1}{2} g(t - T)^2$

$\Rightarrow uT + \frac{1}{2} gT^2 = gtT$

$\Rightarrow t = \frac{u}{g} + \frac{T}{2}$

and $h_1 = u\left(\frac{u}{g} + \frac{T}{2}\right) - \frac{1}{2} g\left(\frac{u}{2} + \frac{T}{2}\right)^2$

$= \frac{u^2}{2g} - \frac{gT^2}{8}$.

4. Ans: (2)

5.

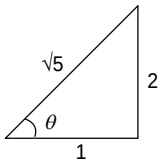
(1) $R = 2H$ given

We know $R = 4H\cot\theta \Rightarrow \cot\theta = \frac{1}{2}$

From triangle we can say that $\sin\theta = \frac{2}{\sqrt{5}}, \cos\theta = \frac{1}{\sqrt{5}}$

$\therefore$ Range of projectile $R = \frac{2v^2\sin\theta\cos\theta}{g}$

$= \frac{2v^2}{g} \times \frac{2}{\sqrt{5}} \times \frac{1}{\sqrt{5}} = \frac{4v^2}{5g}$.



6.

(4) $T = \frac{2 \times m_B m_C}{m_A + m_B + m_C} \times g = \frac{2 \times 1 \times 5}{3+1+5} \times g = \frac{10}{9} g$.

7.

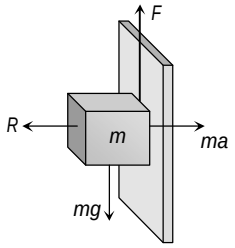
(1) For the limiting condition upward friction force between board and block will balance the weight of the block.

i.e. $F > mg$

$\Rightarrow \mu(R) > mg$

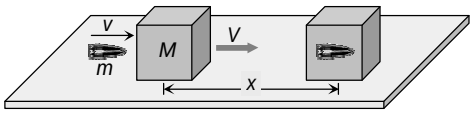
$\Rightarrow \mu(ma) > mg$

$\Rightarrow \mu > \frac{g}{a}$



8.

(3)



Let speed of the bullet = v

Speed of the system after the collision = V

By conservation of momentum $mv = (m+M)V$

$\Rightarrow V = \frac{mv}{M+m}$

So the initial K.E. acquired by the system

$= \frac{1}{2}(M+m)V^2 = \frac{1}{2}(m+M)\left(\frac{mv}{M+m}\right)^2 = \frac{1}{2}\frac{m^2v^2}{(m+M)}$

This kinetic energy goes against friction work done by friction = $\mu R \times x = \mu(m+M)g \times x$

By the law of conservation of energy

$\frac{1}{2}\frac{m^2v^2}{(m+M)} = \mu(m+M)g \times x \Rightarrow v^2 = 2\mu g x\left(\frac{m+M}{m}\right)^2$

$\therefore v = \sqrt{2\mu g x}\left(\frac{M+m}{m}\right)$

9. (2) Momentum and kinetic energy is conserved only in this case.

10.

(3) $E = \frac{1}{2}mv^2$. Differentiating *w.r.t.x*, we get

$$\frac{dE}{dx} = \frac{1}{2}m \times 2v\frac{dv}{dx} = mv \times \frac{dv}{dt} \times \frac{dt}{dx} = mv \times \frac{a}{v} = ma$$

11. (1) $\vec{L} = \vec{r} \times \vec{p} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & 2 & -1 \\ 3 & 4 & -2 \end{vmatrix} = 0\hat{i} - \hat{j} - 2\hat{k} = -\hat{j} - 2\hat{k}$ and the *X*- axis is given by $i + 0\,\hat{j} + 0\hat{k}$

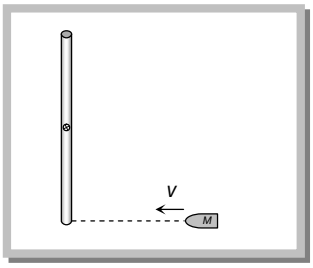
Dot product of these two vectors is zero *i.e.* angular momentum is perpendicular to *X*-axis.

12. (3) Initial angular momentum of the system = Angular momentum of bullet before collision $= Mv\left(\frac{L}{2}\right)$.....(i)

let the rod rotates with angular velocity ω.

Final angular momentum of the system $= \left(\frac{ML^2}{12}\right)\omega + M\left(\frac{L}{2}\right)^2\omega$ .....(ii)

By equation (i) and (ii) $Mv\frac{L}{2} = \left(\frac{ML^2}{12} + \frac{ML^2}{4}\right)\omega$ or $\omega = 3v/2L$



13. (4) $\frac{K_A}{K_B} = \frac{r_B}{r_A} = \left(\frac{R + h_B}{R + h_A}\right) = \left(\frac{R + 2R}{R + R}\right) = \frac{3}{2}$

14. (3) $v_e = \sqrt{2gR} \Rightarrow \frac{v_A}{v_B} = \sqrt{\frac{g_A}{g_B} \times \frac{R_A}{R_B}} = \sqrt{x \times r}$ $\therefore \frac{v_A}{v_B} = \sqrt{rx}$

15. (1) $l \propto \frac{1}{Y} \Rightarrow \frac{Y_s}{Y_c} = \frac{l_c}{l_s} \Rightarrow \frac{l_c}{l_s} = \frac{2 \times 10^{11}}{1.2 \times 10^{11}} = \frac{5}{3}$ …(i)

Also $l_c - l_s = 0.5$ …(ii)

On solving (i) and (ii) $l_c = 1.25\,cm$ and $l_s = 0.75\,cm$.

16. (3)

$$\mathrm{Mg} = \rho\frac{4}{5}\mathrm{Vg} \quad .....(1)$$

$$(\mathrm{M} + \mathrm{m})\mathrm{g} = \rho\mathrm{Vg} \quad .....(2)$$

$$\frac{(2)}{(1)} \Rightarrow \frac{(\mathrm{M} + \mathrm{m})\mathrm{g}}{\mathrm{Mg}} = \frac{\rho\mathrm{Vg}}{\rho\frac{4}{5}\mathrm{Vg}}$$

$$\frac{\mathrm{M} + \mathrm{m}}{\mathrm{M}} = \frac{5}{4}$$

$$4\mathrm{M} + 4\mathrm{m} = 5\mathrm{M}$$

$$\mathrm{M} = 4\mathrm{m}$$

17. (3)

or $W = T[(4\pi r^2)n - 4\pi R^2] = T \cdot 4\pi (nr^2 - R^2)$

where $n \times \frac{4}{3}\pi r^3 = \frac{4}{3}\pi R^3$ and $W = \frac{1}{2}mv^2$

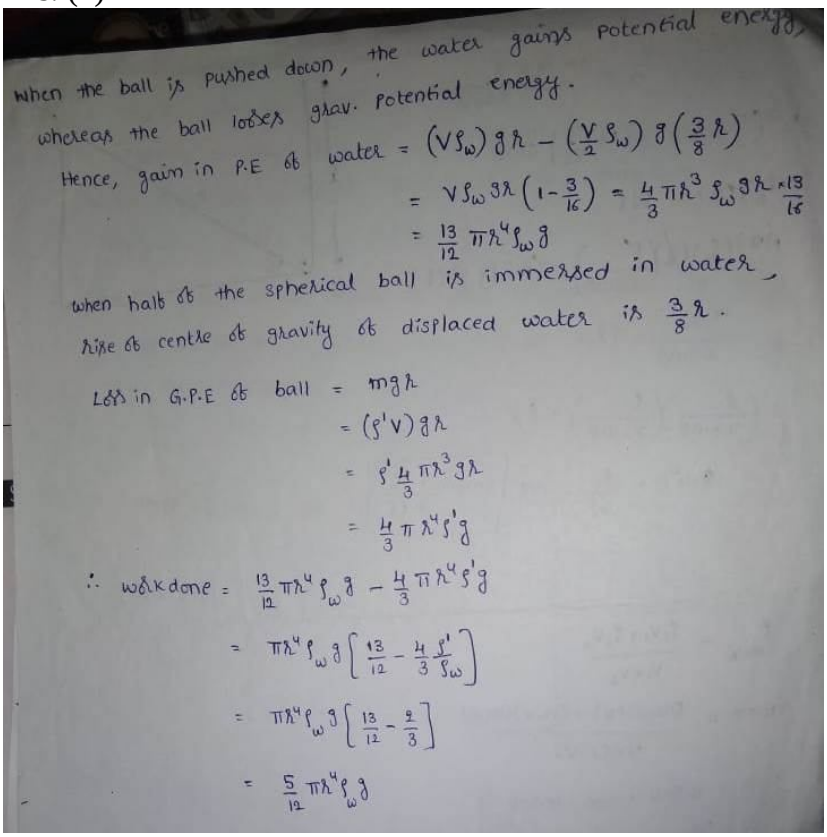
$\therefore \quad \frac{1}{2}mv^2 = T \cdot 4\pi (nr^2 - R^2)$

or $\frac{1}{2} \times \frac{4}{3}\pi R^3 \rho v^2 = T \cdot 4\pi (nr^2 - R^2)$

or $v = \sqrt{\frac{6T}{\rho}\left(\frac{nr^2}{R^3} - \frac{R^2}{R^3}\right)}$

$= \sqrt{\frac{6T}{\rho}\left(\frac{nr^2}{nr^3} - \frac{1}{R}\right)} = \sqrt{\frac{6T}{\rho}\left(\frac{1}{r} - \frac{1}{R}\right)}$.

18. Ans: (1)



19. (2) When length of the liquid column remains constant, then the level of liquid moves down with respect to
the container, thus γ must be less than 3α.
Now we can write $V = V_0(1 + \gamma\Delta T)$
Since $V = Al_0 = [A_0 (1 + 2\alpha\Delta T)]l_0 = V_0 (1 + 2\alpha\Delta T)$
Hence $V_0(1 + \gamma\Delta T) = V_0(1 + 2\alpha\Delta T) \Rightarrow \gamma = 2\alpha$.

20. (2) As we know $\alpha = \frac{\Delta L}{L_0 \Delta\theta} \Rightarrow \Delta\theta = \frac{\Delta L}{\alpha L_0} = \frac{5\times10^{-5}}{10\times10^{-6}\times1} = 5°C$

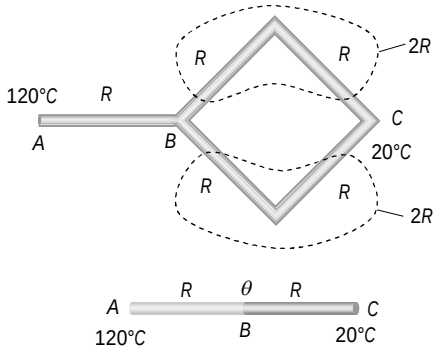
21. (4) $v_{rms} = \sqrt{\frac{3RT}{M}} \Rightarrow v_{rms} \propto \sqrt{\frac{T}{M}}$

$$\frac{v_2}{v_1}=\sqrt{\frac{M_1}{M_2}\times\frac{T_2}{T_1}}=\sqrt{\frac{1}{2}\times\frac{1}{2}}\Rightarrow v_2=\frac{v_1}{2}=\frac{300}{2}=150\text{m/sec}$$

22. (2) $\gamma_{mix}=\dfrac{\dfrac{\mu_1\gamma_1}{\gamma_1-1}+\dfrac{\mu_2\gamma_2}{\gamma_2-1}}{\dfrac{\mu_1}{\gamma_1-1}+\dfrac{\mu_2}{\gamma_2-1}}=\dfrac{\dfrac{3\times1.3}{(1.3-1)}+\dfrac{2\times1.4}{(1.4-1)}}{\dfrac{3}{(1.3-1)}+\dfrac{2}{(1.4-1)}}=1.33$

23. (3) $W_{AB}=-P_0V_0$, $W_{BC}=0$ and $W_{CD}=4P_0V_0$
$\Rightarrow W_{ABCD}=-P_0V_0+0+4P_0V_0=3P_0V_0$

24. (3) If thermal resistance of each rod is considered R then, the given combination can be redrawn as follows



(Heat current)$_{AC}$ = (Heat current)$_{AB}$

$$\frac{(120-20)}{2R}=\frac{(120-\theta)}{R}\Rightarrow\theta=70^\circ C$$

25. (2) The two springs on left side having spring constant of 2k each are in series, equivalent constant is $\dfrac{1}{\left(\dfrac{1}{2k}+\dfrac{1}{2k}\right)}=k$. The two springs on right hand side of mass M are in parallel. Their effective spring constant is $(k+2k)=3k$.

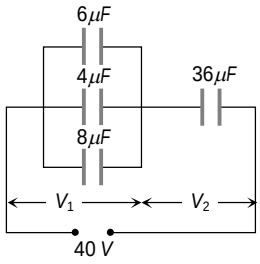
Equivalent spring constants of value k and $3k$ are in parallel and their net value of spring constant of all the four springs is $k+3k=4k$

$\therefore$ Frequency of mass is $n=\dfrac{1}{2\pi}\sqrt{\dfrac{4k}{M}}$

26. (2) From the given equation $\omega_1=2\pi n_1=646\pi\Rightarrow n_1=323$
and $\omega_2=2\pi n_2=652\pi\Rightarrow n_2=326$
Hence, beat frequency $=326-326=3$

27. (2) Suppose N resonance occurred before tube coming out.
Hence by using $l=\dfrac{(2N-1)v}{4n}$
$\Rightarrow 1.5=\dfrac{(2N-1)\times330}{4\times660}\Rightarrow N\approx6$.

28. (3) Given circuit can be redrawn as follows capacitors, $9\mu F$, $9\mu F$ and $7\mu F$ are short circuited. So they are deleted.



$V_1 + V_2 = 40V$

and $\frac{V_1}{V_2} = \frac{36}{18} = 2$

Hence $V_1 = \frac{80}{3}V$

and $V_2 = \frac{40}{3}V$

Charge on $8\mu F$ capacitor $= 8 \times \frac{80}{3} = 213.3\mu F \approx 214\mu F$

29. (1) When key is open, charge in steady state will be $q_1 = CE$.

When key is closed, potential difference across capacitor will be $V = \frac{2R}{R+2R}E = \frac{2}{3}R$

Charge in steady state will be $q_2 = \frac{2}{3}CE \Rightarrow \frac{q_1}{q_2} = \frac{3}{2}$.

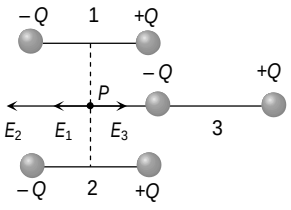
30. (2)

$$R_{t_1} = R_1[1 + \alpha_1 t]$$
$$R_{t_2} = R_2[1 + \alpha_2 t]$$
$$R_{t_s} = R_{t_1} + R_{t_2}$$
$$= R_1[1 + \alpha_1 t] + R_2[1 + \alpha_2 t]$$
$$= (R_1 + R_2) + (R_1\alpha_1 + R_2\alpha_2)t$$
$$= R_s + (R_1\alpha_1 + R_2\alpha_2)t$$
$$\alpha_s = \frac{R_{t_s} - R_s}{R_s t}$$
$$= \frac{(R_1\alpha_1 + R_2\alpha_2)}{R_1 + R_2}$$

31. (3) Point P lies at equatorial positions of dipole 1 and 2 and axial position of dipole 3.

Hence field at P

due to dipole 1



$E_1 = \frac{k.p}{x^3}$ (towards left)

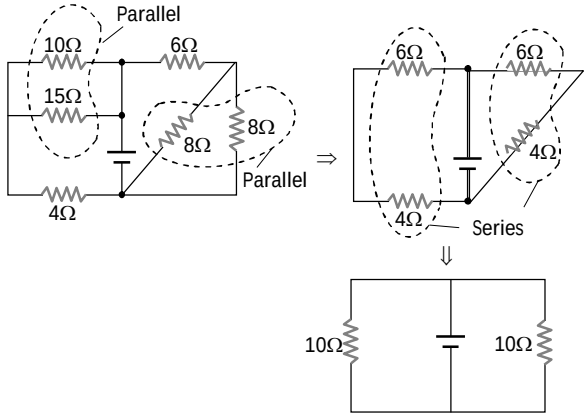
due to dipole 2

$E_2 = \frac{k.p}{x^2}$ (towards left)

due to dipole 3 $E_3 = \frac{k.(2p)}{x^3}$ (towards right)

So net field at P will be zero.

32. (3) Given circuit can be reduced to a simple circuit as shown in figures below



i.e. $R_{eq} = 5\Omega$.

33. (2) $\frac{i_g}{i} = \frac{S}{G+S} \Rightarrow i_g G = (i - i_g)S$

$\therefore\ i_g G = (0.03 - i_g)4r$ .....(i)

and $i_g G = (0.06 - i_g)r$ .....(ii)

From (i) and (ii)

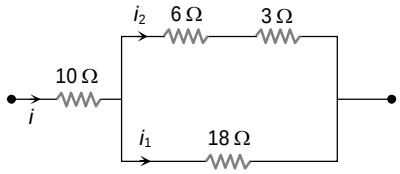
$0.12 - 4i_g = 0.06 - i_g \Rightarrow i_g = 0.02A.$

34. (2) The given circuit can be redrawn as follows

$\frac{i_1}{i_2} = \frac{9}{18} = \frac{1}{2}$

and $i = i_1 + i_2$

$\Rightarrow \frac{i}{i_1} = 1 + \frac{i_2}{i_1} = 1 + 2 = 3$



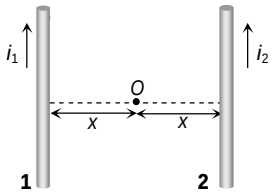
From $P = i^2 R \Rightarrow \frac{P_{10\Omega}}{P_{18\Omega}} = \left(\frac{i}{i_1}\right)^2 \times \frac{10}{18} \Rightarrow P_{10\Omega} = 10W$

35. (4) Initially when wires carry currents in the same direction as shown.

Magnetic field at mid point*O* due to wires 1 and 2 are respectively

$B_1 = \frac{\mu_0}{4\pi}.\frac{2i_1}{x} \otimes$

and $B_2 = \frac{\mu_0}{4\pi}.\frac{2i_2}{x} \odot$

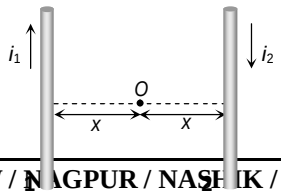


Hence net magnetic field at $O\ B_{net} = \frac{\mu_0}{4\pi} \times \frac{2}{x} \times (i_1 - i_2)$

$\Rightarrow 10 \times 10^{-6} = \frac{\mu_0}{4\pi}.\frac{2}{x}(i_1 - i_2)$ ..... (i)

If the direction of i_2 is reversed then

$B_1 = \frac{\mu_0}{4\pi}.\frac{2i_1}{x} \otimes$



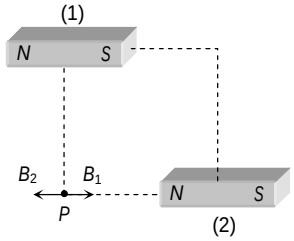
and $B_2 = \frac{\mu_0}{4\pi}.\frac{2i_2}{x} \otimes$

So $B_{net} = \frac{\mu_0}{4\pi}.\frac{2}{x}(i_1 + i_2)$

$\Rightarrow 40\times10^{-6} = \frac{\mu_0}{4\pi}.\frac{2}{x}(i_1 + i_2)$ ..... (ii)

Dividing equation (ii) by (i) $\frac{i_1 + i_2}{i_1 - i_2} = \frac{4}{1} \Rightarrow \frac{i_1}{i_2} = \frac{5}{3}$

36. (1) Point *P* lies on equatorial line of magnet (1) and axial line of magnet (2) as shown

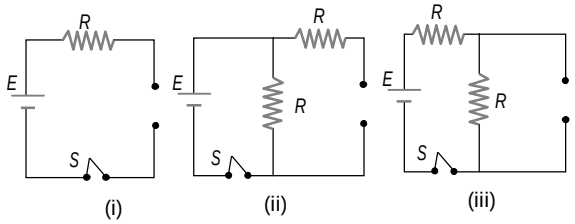


$B_1 = \frac{\mu_0}{4\pi}\cdot\frac{M}{d^3} = 10^{-7}\times\frac{1000}{(0.1)^3} = 0.1T$

$B_2 = \frac{\mu_0}{4\pi}\cdot\frac{2M}{d^3} = 10^{-7}\times\frac{2\times1000}{(0.1)^3} = 0.2T$

$\therefore B_{net} = B_2 - B_1 = 0.1T$

37. (2) At $t = 0$ current through L is zero so it acts as open circuit. The given figures can be redrawn as follow.



$i_1 = 0$ $i_2 = \frac{E}{R}$ $i_3 = \frac{E}{2R}$

Hence $i_2 > i_3 > i_1$.

38. (2) $V_0 = i_0 Z \Rightarrow 200 = 100\ Z \Rightarrow Z = 2\Omega$

Also $Z^2 = R^2 + X_L^2 \Rightarrow (2)^2 = (1)^2 + X_L^2 \Rightarrow X_L = \sqrt{3}\Omega$

39. (3) Radius of circular path described by a charged particle in a magnetic field is given by $r = \frac{\sqrt{2mK}}{qB}$;

where K = Kinetic energy of electron $\Rightarrow K = \frac{q^2B^2r^2}{2m} = \left(\frac{e}{m}\right)\frac{eB^2r^2}{2}$

$= \frac{1}{2}\times1.7\times10^{11}\times1.6\times10^{-19}\times\left(\frac{1}{\sqrt{17}}\times10^{-5}\right)^2\times(1)^2$

$= 8\times10^{-20}\,J = 0.5eV$

By using $E = W_0 + K_{max}$

$$\Rightarrow W_0 = E - K_{max} = \left(\frac{12375}{2475}\right)eV - 0.5eV = 4.5eV$$

40. (3) $\lambda = \frac{h}{p} \Rightarrow \lambda - \frac{0.5}{100}\lambda = \frac{h}{p+\Delta p} \Rightarrow \frac{199\lambda}{200} = \frac{h}{p+\Delta p} = \frac{199}{200}\frac{h}{p}$

$$\Rightarrow p + \Delta p = \frac{200}{199}p \Rightarrow p = 199\,\Delta p$$

41. (2) By using $I = 4I_0\cos^2\left(\frac{\varphi}{2}\right) = 4I_0\cos^2\left(\frac{\pi\Delta}{\lambda}\right)$

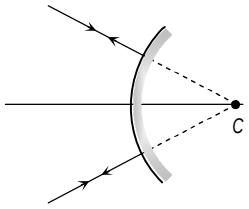
$$\left\{\because \varphi = \frac{2\pi}{\lambda}\Delta\right\}$$

$$\Rightarrow \frac{I_1}{I_2} = \frac{\cos^2\left(\frac{\pi\Delta_1}{\lambda}\right)}{\cos^2\left(\frac{\pi\Delta_2}{\lambda}\right)} = \frac{\cos^2\left(\frac{\pi.\frac{\lambda}{4}}{\lambda}\right)}{\cos^2(0)} = \frac{1}{2}$$

42. (3) Here object and image are at the same position so this position must be centre of curvature

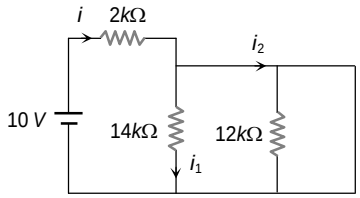
$\therefore R = 12\ cm$

$\Rightarrow f = \frac{R}{2}$



43. (3) $m = \sqrt{m_1^2 + m_2^2} = \sqrt{(0.16) + (0.09)} = 0.5$

44. (4) Equivalent circuit can be redrawn as follows



$$i = \frac{10}{2} = 5\,mA = i_2$$

$$i_1 = 0$$

45. (2)

Since, $\beta = \frac{\alpha}{1-\alpha}$

$\therefore$ $\alpha\beta = \frac{\alpha^2}{1-\alpha}$ ...(i)

$\beta - \alpha = \frac{\alpha}{1-\alpha} - \alpha = \frac{\alpha^2}{1-\alpha}$ ...(ii)

$\therefore$ $\left(\frac{\beta-\alpha}{\alpha\beta}\right) = \left(\frac{\alpha^2}{1-\alpha}\right)\left(\frac{1-\alpha}{\alpha^2}\right) = 1.$

in doped semiconductor,

46. e^- in 1 atom of O^{2-} – 18 – 8 = 10
Moles of $e^- = 10 \times 2 \times 10^{-3}$
No. of $e^- = 6 \times 10^{23} \times 2 \times 10 \times 10^{-3}$
$= 1.2 \times 10^{22}$

47. Precipitation when $K_{IP} > K_{SP}$
In first option:
$K_{IP} = \frac{10^{-4}}{2} \times \frac{10^{-4}}{2} > 1.8 \times 10^{-10}$
Concentration is halved, when equal vol. is mixed

48. $N_2O_4 \rightleftharpoons 2NO_{2(g)} \rightarrow \frac{1}{K_2}$
$2NO_2 \rightleftharpoons N_2 + 2O_2 \rightarrow \frac{1}{K_1^2}$
Adding both, we get the desired reaction
$\therefore K = \frac{1}{K_2} \times \frac{1}{K_1^2} = \frac{1}{K_2 K_1^2}$

49. $AgI \rightleftharpoons Ag^+ + I^-$
S 10^{-4}
$S \times 10^{-4} = 1 \times 10^{-16}$
$\therefore S = 10^{-12}$

50. $M_{urea} < M_{glucose} < N_{sucrose}$ (Molar mass)
$\therefore$ for same percentage
$n_{urea} > n_{glucose} > n_{sucrose}$

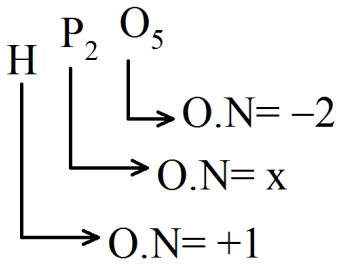
51. $w = -nRT \ln\left(\frac{v_2}{v_1}\right) \times 101J$
$= -2 \times \frac{1}{12} \times 300 \ln(10) \times 101J$
$= -50 \times 2.3 \times 101$ J
$= -11.615$ KJ

52. $\Delta H = \left(H_{C=C} + H_{H-H}\right) - 2H_{C-H} - H_{C-C}$
$= -120.02$ KJ/mol

53. Average velocity $= \sqrt{\frac{8RT}{\pi M}}$
$\frac{v_2}{v_1} = \sqrt{\frac{T_2}{T_1}} = \sqrt{\frac{2}{1}} = 1.4$

54. Free expansion : w = 0
Adiabatic : q = 0
$\therefore$ u is also zero

55.



$4\times(+1)+2\times(x)+5x(-2)=0$

$x=+3$

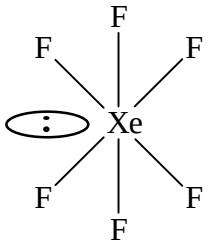
Similarly, calculate for others.

56. $NaNO_3 \xrightarrow{\Delta} NaNO_2+\frac{1}{2}O_2$

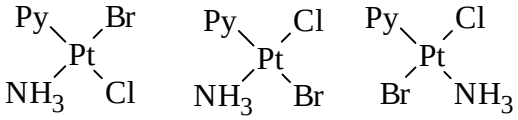
57. Factual

58. d orbital of chlorine and p-orbital of oxygen is involved.

59.



60.



61. As oxidation number increases, percentage decreases.

62. $\frac{r_1}{r_2}=\sqrt{\frac{M_2}{M_1}}$

$\frac{10}{x}=\sqrt{\frac{2}{72}}\Rightarrow x=60\,m/s$

63. $\Delta S_{mix}>0$

Raoult's law is followed

64. Factual

65. Inert pair effect

66. $[B]=\frac{K_1}{K_1+K_2}\times 100$

$$= \frac{12.6\times10^{-4}\times100}{12.6\times10^{-4}+3.8\times10^{-4}}$$

= 76.83%

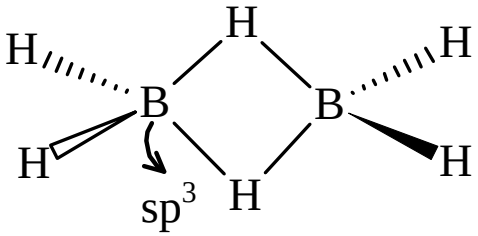
[C] = 100 – 76.83 = 23.17%

67. $Mn^{2+} < Fe^{2+} < Co^{2+} < Ni^{2+} < Cu^{2+} > Zn^{2+}$

68. rate α $[A]^1$

$$\frac{d[A]}{dt}\alpha[A]$$

69.



Bridge bonding

70.

$Na_2SO_4 \rightarrow 2Na^+ + SO_4^{2-}$

$1-\alpha \quad 2\alpha \quad \alpha$

$0.004(1-\alpha)+0.008\alpha+0.004\alpha=0.01$

$0.008\alpha = 0.01-0.004$

$\alpha = 75\%$

71.

$A + B \rightleftharpoons C + D$

4 4 2 2

$\frac{-2}{2}\ \frac{-2}{2}$

$K = \frac{[2]\times[2]}{[2]\times[2]} = 1$

72. For isothermal process, $\Delta u = 0$

73. $E^{o}_{cell} = 0.72 - 0.42$

= 0.3

$$E_{cell} = 0.3 - \frac{0.0591}{6}\log\left(\frac{0.1^2}{0.01^3}\right)$$

$= 0.3 - 0.1\times4$

$= 0.3 - 0.04$

= 0.26

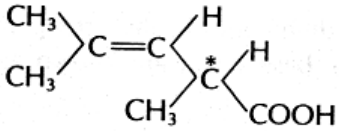
74. $2H^+ + 2e^- \rightarrow H_2$

$E_{cell} = 0$

75. (3) For a body centered cubic (BCC) the packing fraction is 0.68.

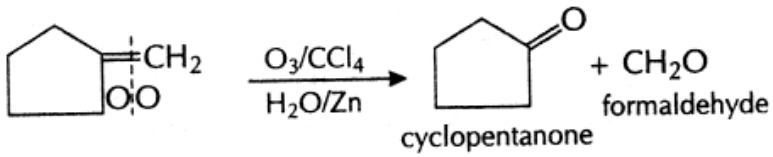
76. When n= even number then for two identical ends, number of geometrical isomers
$= 2^{n-1}+2^{n/2-1}$
$= 2^1+2^0=3$

77.

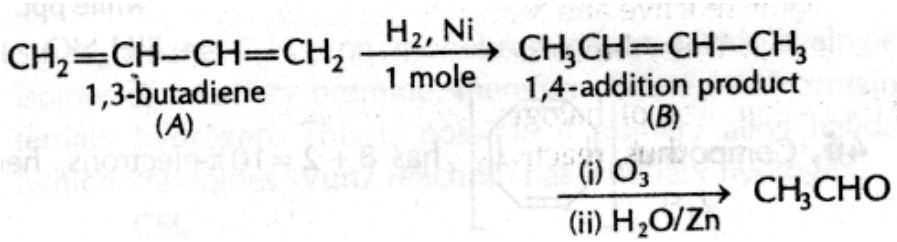


The above compound has chiral centre.
Hence, it can exhibit optical isomerism while geometrical isomerism is not possible due to the presence of identical groups on double bonded carbon atoms.

78.

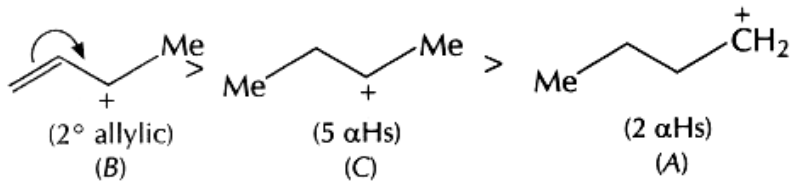


79.

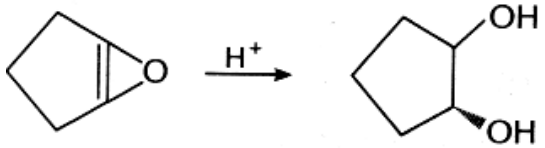


80.

Higher the stability of carbocation, faster is the reaction because S_N1 reactions involve the formation of carbocation intermediate.



81.



82. (3)

83. (1)

84.

$$20 \times 0.4 = 40 \times N \qquad (\because\ N_1V_1 = N_2V_2)$$

or $N = 0.2$

$$\therefore \quad M = \frac{0.2}{2} = 0.1\ \text{M}$$

85.

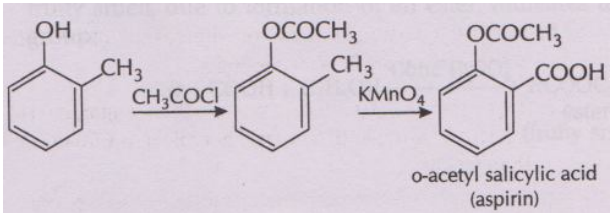
Additon of 3-10% sulphur to rubber, makes it hard

86.

Aldehydes and α – hydroxyl ketones give positive Tollen's test. Glucose is a polyhydroxy aldehyde and fructose is an α – hydroxyl ketone.

87. ()

88.



o-acetyl salicylic acid (aspirin)

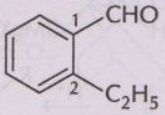
89.

(i) The compound with molecular formula $C_9H_{10}O$ forms a 2,4-DNP derivative and reduces Tollen's reagent, so it is an aldehyde.

(ii) It undergoes Cannizzaro reaction, so the aldehyde group should be directly attached to the benzene ring.

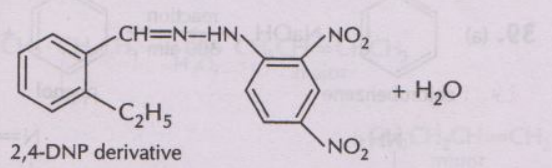
(iii) On vigorous oxidation, it gives 1,2-benzene dicarboxylic acid, so it should be an *ortho* substituted benzaldehyde. For molecular formula $C_9H_{10}O$, the possibility is only *o*-ethyl benzaldehyde.

(iv) The equations for all the reactions are given below



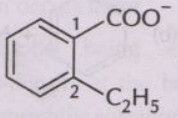
2-ethylbenzaldehyde ($C_9H_{10}O$)

↓ 2, 4-DNP



2,4-DNP derivative

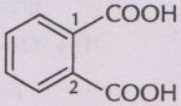
Tollen's reagent
$[Ag(NH_3)_2]OH$



+ Ag
Silver mirror

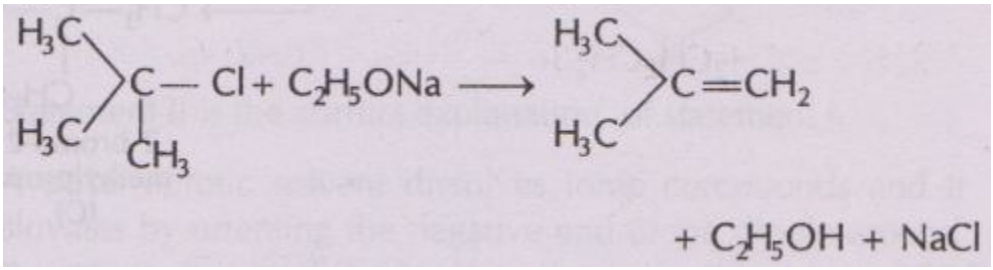
2-ethyl benzoate

[O]



1,2- benzene dicarboxylic acid

90.



91. Living world Pg – 10
92. Bio Class – Pg 23
93. PK – Pg 30
94. MOFP – Pg 70
95. ANAT – Pg 90,91
96. CELL – Pg 137
97. CELL DIV –
    If homologous chromosomes fail to separate no. of chromosomes will not be equally distributed
98. TRANSPORT – Pg 185
99. MINERAL – Pg 196
100. PHOTO – Pg 208
101. RESPI – Pg 227,228,232, 230
102. PGD – Pg 243
103. REPRO – Pg 6
104. SEXUAL REPRO –
    1 pollen sac = 1000 mmc
    4 pollen sacs = 4000 mmc
    4 mmc = 4 pollen grains
    4000 mmc = 16,000 pollen grains
105. PRINCIPLES –
    In, f2 yellow = green = 12:4 : 3:1
    Pg. 79
106. MOLECULAR
    A = 20% $\therefore$ T=20%
    100-40=60 $\therefore$ G=30% : C=30%
107. ENHANCEMENT – Pg 177
108. MICROBES Pg. 183
109. ECOSYSTEM
    Pg. 243
110. BIODIVERSITY- Pg. 262
111. ENVIRONMENTAL ISSUES – Pg. 276
112. BIOLOGICAL CLASSIFICATION – Pg 20,27
113. PK – Pg 34
114. CELL – Pg 133,134
115. CELL DIVISION – Pg 163, 164, 167
116. MOFP – Pg. 79
117. ANAT – Pg. 97
118. TRANSPORT – Pg 179
119. MINERAL – Pg 204
120. PHOTO – Pg 211, 212
121. RESPI – Pg 232
122. PGD – Pg 251
123. SEXUAL – Pg. 27

124. PRINCIPLES – Pg. 87
125. MOLECULAR –
There will be no $N^{14} – N^{14}$ Containing DNA
126. ENHANCEMENT – Pg. 177
127. MICROBES – Pg 183, 187
128. ORG & POPL – Pg 235
129. ECOSYSTEM – Pg 252
130. BIODIV – Pg 265
131. ISSUES – Pg 282, 283
132. CELL – Pg 136
133. MORPHO – Pg 79, 80, 81
134. PHOTO – Pg. 213
135. RESPI –
When 1 molecule of glucose is oxidized 8 $NADH_2$ & $2FADH_2$ are formed.
136. PGD – Pg 248, 249, 250
137. SEXUAL – Pg 24,25
138. PRINCIPLES :
Parent $\rightarrow Hb^AHb^S \times Hb^AHb^S$
1^{st} Child $\rightarrow Hb^AHb^S$
3^{rd} Child $\rightarrow Hb^SHb^S$
139. MOLECULAR
Mutation occurud in lacy lacy is responsible for synthesis of permease, lacy is responsible for synthesis of permease which permits lactose inside the cell
140. ORG & POPL – Pg 230
141. NCERT, class XII, pg no- 130 & 131
142. Simple reflexes in human body are monosynaptic that is possess a synapse between axon of sensory neuron & Dendron of motor neuron. There is no interneuron
143. NCERT, class XI, pg no- 51,52,57 & 60.
144. NCERT, class XI, pg no- 338 & 339
145. NCERT, class XII, pg no- 60
146. NCERT, class XI, pg no- 262
147. NCERT, class XI, pg no- 332, 336 & 337
148. NCERT, class XI, pg no- 324, 325 & 326
149. NCERT, class XI, pg no- 297
150. NCERT, class XII, pg no- 45
151. NCERT, class XII, pg no- 152
152. NCERT, class XII, pg no- 50 & 51
153. NCERT, class XI, pg no- 55 & 56
154. Class XI, pg no- 262, 264 & 265
155. Class XII, pg no- 140 & 142
156. NCERT, class XI, pg no- 108
157. Chodroblasts are the cartilage forming cells and they do not possess protoplasmic processes. Protoplasmic processes are present in neurons, dendritic cells, melanocytes etc
158. NCERT, class XII, pg no- 150 & 151
159. NCERT, class XII, pg no- 52
160. Opiods are responsible for
Constriction of pupil (sometimes even pin-point pupil), because they act on the muscles of iris which is innervated by parasympathetic nerves
161. NCERT, class XI, pg no- 54

162. Nucleosidase is secreted by intestinal mucosa.
163. The major inosganic component of muscle (Any cell) is water
In striated muscle it accounts for 70-75%
164. NCERT, class XII, pg no- 61
165. NCERT, class XI, pg no- 326
166. NCERT, class XI, pg no- 50 & 51
167. Frequency of dominant allele A (p) = 0.6
So, According to hardy Weinberg equilibrium, frequency of recessive allele = 1-0.6
a (q) = 0.4
(as p+q=1)
So frequency of heterozygous
Individual = 2pq
$= 2 \times 0.6 \times 0.4$
$= 0.48$

168. NCERT, class XII, pg no- 136
169.
Mammals – oriparous mammal – platypus / ornithorhyncu
Reptiles – 3 & half chambered heart – crocodile
Sponges – Fresh water sponge (Spongilla)
170. NCERT, class XI, pg no- 48 & 60
171. The parasympathetic nervous system
Decreases heart rate and cardiac output, while the sysmpathetic nervous system increases Both heart rate and cardiac-output
172. NCERT, class XI, pg no-324
173. NCERT, class XI, pg no- 333
174. NCERT, class XII, pg no- 137
175. Clavicle & glenoid cavity – pectoral girdle
176. NCERT, class XI, pg no- 52,53 & 54
177. Premolars are absent in decidce ous teeth
NCERT, class XI, pg no-
178.
Both pnevmonia and common cold are communicable diseases,
Pneumonia is a bacterial disease
[Caused by streptococcus pneumonal or H. influenzae] while common cold mostly is a viral infection [coronavirus / Rhinovirus]
Pneumonia affects the lower respiratory tract [Alveoli & its ducts], while Common cold usually Do not involve lower respiratory tract. Its is restrieted to upper part of respiratory tract [Nasal passage, larynx etc].
179. NCERT, class XI, pg no – 114
180. NCERT, class XI, pg no – 101