Enthusiast, Leader & Achiever Course

PHASE : ALL PHASE

TARGET : PER-MEDICAL 2020

Test Type : **MAJOR** Test Pattern : **NEET (UG)**

TEST DATE : 08-09-2020

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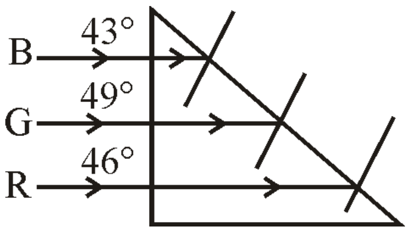
Q.	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
A.	3	3	3	1	4	2	4	4	3	3	4	1	2	4	4	3	3	3	1	4	4	2	4	1	2	2	4	1	1	4

HINT – SHEET

1. **Ans (3)**



For each ray angle of incidence = 45°

For blue and green $i > \theta_c$

so B and G will get reflected while red will get refracted

2. **Ans (2)**

$$\frac{1}{f_1} = (1.2 - 1)\left(\frac{1}{\infty} - \frac{1}{-14}\right) = \frac{0.2}{14}$$

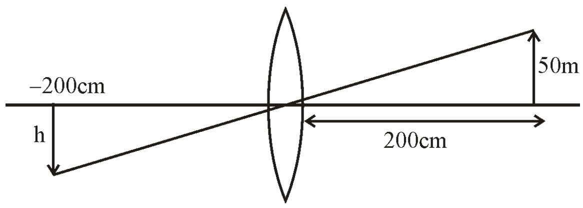
$$\frac{1}{f_2} = (1.5 - 1)\left(\frac{1}{14} - \frac{1}{\infty}\right) = \frac{0.5}{14}$$

$$\frac{1}{f_{eq}} = \frac{0.7}{14} = \frac{1}{20}$$

$$\frac{1}{v} - \frac{1}{-40} = \frac{1}{20}$$

v = 40 cm

3. **Ans (1)**



$$\frac{h}{2.00\text{ m}} = \frac{50\text{m}}{2000\text{m}}$$

$$\Rightarrow h = \frac{1}{20}\text{m} = 5\text{cm}$$

4. **Ans (2)**

$$K_{max} = h\nu - \phi = 6.2 - 4.2 = 2\text{eV}$$

$$= 2 \times 1.6 \times 10^{-19}$$

$$= 3 \times 10^{-19}\text{J}$$

5. Ans (1)

Energy in one reaction of

${}^{235}_{92}U \rightarrow 200$ MeV

in N_A Reaction $E = 200 \text{ MeV} \times N_A$

means energy emitted by 235 gram

${}_{92}U^{235} \rightarrow N_A \times 200$ MeV

by m gram uranium $\rightarrow \dfrac{(N_A \times 200\text{MeV}) \times m}{235}$

If it is in one day then

$$\frac{(N_A \times 200\text{MeV})m}{235} = (0.95 \text{ Mw}) \times 1 \text{ day}$$

$$m = \frac{0.95\text{MW} \times (24 \times 3600 \text{ sec}) \times 235}{N_A \times 200\text{MeV}}$$

$$m = \frac{0.95 \times 10^6 \times 24 \times 3600 \times 235}{6 \times 10^{23} \times 200 \times 10^6 \times 1.6 \times 10^{-19}} \text{ gram}$$

on solving

m = 1 gram

6. Ans (3)

$$\lambda \propto \frac{1}{\sqrt{T}} \Rightarrow \frac{\lambda_1}{\lambda_2} = \sqrt{\frac{T_2}{T_1}}$$

$$\Rightarrow \frac{\lambda}{\lambda_2} = \sqrt{\frac{1200}{300}}$$

$$\lambda_2 = \frac{\lambda}{2}$$

7. Ans (3)

10 gm ice at –20°C

⇒ 10 gm ice at 0°C – 100 cal

⇒ 10 gm water at 0°C – 900 cal

10 gm water at 50°C

⇒ 10 gm water at 0°C + 500 cal

⇒ 20 gm water at 0°C – 400 cal

⇒ 400 = (x)(80)

5 gm water will convert in ice

temperature of mixture will be 0°C

8. Ans (3)

$$T_{mix} = \frac{m_1 s_1 T_1 + m_2 s_2 T_2}{m_1 s_1 + m_2 s_2}$$

$$T_{mix} = \frac{(2m)(35)75 + (3m)(45)(15)}{(2m)(35) + (3m)(45)}$$

$T_{mix} = 35°C$

9. Ans (4)

Real gas molecules exxerts molecular forces on each other.

10. Ans (1)

AB → constant P, T will be increasing with increasing V

BC → constant T, P will be decreasing with increasing V

CD → constant V, decreasing P, hence decreasing T

DA → constant T, decreasing V, increasing P

Also, BC is at a higher temperature than AD.

11. Ans (1)

Energy conservation

$$-\frac{GMm}{R} + 0 = -\frac{3}{2}\frac{GMm}{R} + \frac{1}{2}mV^2$$

$$V_e = \sqrt{\frac{2Gm}{R}} \quad \text{so} \quad V = \frac{V_e}{\sqrt{2}}$$

12. Ans (2)

$$\mu = \frac{1}{2}\varepsilon_0 E_{rms}^2 + \frac{1}{2\mu_0} B_{rms}^2$$

$$\Rightarrow \frac{1}{2}\varepsilon_0 E_{rms}^2 + \frac{1}{2\mu_0}\left(\frac{E_{rms}^2}{C^2}\right)$$

$$= \frac{1}{2}\varepsilon_0 E_{rms}^2 + \frac{1}{2\mu_0}\left(E_{rms}^2 \ \varepsilon_0 \mu_0\right)$$

$$= \frac{1}{2}\varepsilon_0 E_{rms}^2 + \frac{1}{2}\varepsilon_0 E_{rms}^2$$

$$= \varepsilon_0 E_{rms}^2$$

$= (8.85 \times 10^{-12})\,(720)^2 \Rightarrow 4.58 \times 10^{-6}\ \text{J/m}^3$

13. **Ans (2)**

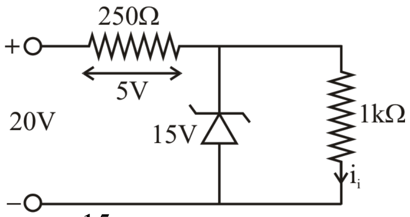
In first case sources are coherent so resultant intensity $= 4I_0$

In second case sources are coherent so resultant intensity $= I_0 + I_0 = 2I_0$

14. **Ans (2)**

$$I^1 = \frac{I}{2}$$

15. **Ans (1)**



$$i_1 = \frac{15}{10^3} = 15\text{mA}$$

$$i = \frac{5}{250} = 20\text{mA}$$

$i_z = i - i_1 = 5\text{mA}$

16. **Ans (2)**

Truth table

A	B	C
0	0	0
1	1	1
0	1	0
1	0	0
0	0	0
1	1	1
0	0	0

Here C = 1 only when A = 1, B = 1 & C = 0 for all other cases so It is C = A.B AND gate

17. **Ans (3)**

$$r = \frac{mv \sin 45^\circ}{qB}$$

$$p = (v \cos 45^\circ)\left(\frac{2\pi m}{qB}\right)$$

$p = 2\pi r$

$$r = \frac{p}{2\pi}$$

$$r = \frac{mv}{\sqrt{2}qB}$$

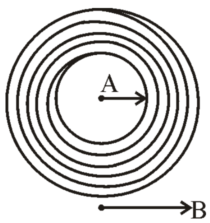
18. **Ans (4)**

Magnetic potential at a distance d from the bar magnet on its axial line

$$V = \frac{\mu_0}{4\pi}\frac{M}{d^2} \Rightarrow V \propto M \frac{V_1}{V_2} = \frac{M_1}{M_2}$$

$$\frac{V}{V_2} = \frac{M}{M/4} \Rightarrow V_2 = V/4$$

19. **Ans (3)**



Number of turns in elimertal width of dr

$$dN = \frac{N}{(b-a)}dr$$

$$dB = \frac{\mu_0 (i) dN}{2r}$$

$$\int dB = \frac{\mu_0 i dN}{2(b-a)}\int_a^b \frac{dr}{r}$$

$$\Rightarrow B_{net} = \frac{\mu_0 N i}{2(b-a)} \ell n\left(\frac{b}{a}\right)$$

20. Ans (1)

$$\frac{I_1}{I_2} = \frac{\frac{1}{2}M_1r_1^2}{\frac{1}{2}M_2r_2^2} = \frac{r_1^2}{r_2^2}$$

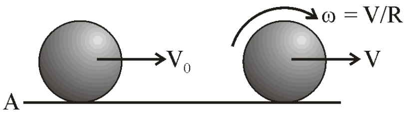
As masses of two discs are equal, hence

$$\left(\pi r_1^2 t\right) d_1 = \left(\pi r_2^2 t\right) d_2$$

$$\therefore \frac{r_1^2}{r_2^2} = \frac{d_2}{d_1}$$

$$\therefore \frac{I_1}{I_2} = \frac{d_2}{d_1} = \frac{8.9}{7.2}$$

21. Ans (2)



AMC about 'A"

$$mV_0R = mV\,R + \left(\frac{mR^2}{2}\right)\left(\frac{V}{R}\right)$$

$$= \frac{3mV\,R}{2}$$

$$V = \frac{2V_0}{3}$$

22. Ans (1)

$$I = neAV_d,\ \ V_d = \frac{1}{neA}$$

$$t = \frac{\ell}{V_d} = \ell\left(\frac{neA}{I}\right)$$

23. Ans (2)

$$S_1 = \frac{\varepsilon}{10}$$

$$S_2 = \frac{\varepsilon}{8}$$

$$\varepsilon' = (5.5)\frac{\varepsilon}{10}$$

$$\varepsilon' = (\ell)\frac{\varepsilon}{8} = (5.5)\frac{\varepsilon}{10}$$

$\ell = 4.4$ m

24. Ans (2)

$$\%\Delta S = \frac{5}{200} \times 100 = 25\%$$

$$\%\Delta t = \frac{0.2}{20} \times 100 = 1\%$$

$$\%\Delta V = = \%\Delta S + \%\Delta t = 3.5\%$$

25. Ans (3)

$$S_1 = \frac{1}{2}a(t_0)^2$$

$$S_2 = at_0^2 + \frac{1}{2}(at_0)^2 = \frac{3}{2}at_0^2$$

$$S_3 = 2at_0^2 + \frac{1}{2}at_0^2 = \frac{5}{2}at_0^2$$

$S_1 : S_2 : S_3 = 1 : 3 : 5$

26. Ans (2)

Area of a v/s t graph

$$= \frac{1}{2} \times 10 \times 2 + 10 \times 2$$

= 30 m/s

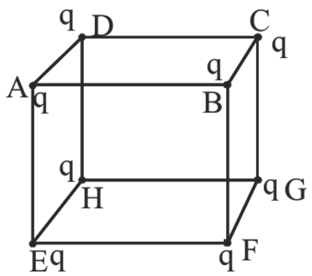
27. Ans (1)

$m_1\Delta X_1 + m_2\Delta X_2 + m_3\Delta X_3 = 0$

$100x + 60\,(10 + x) + 40\,(-10 + x) = 0$

$x = -1$ m

28. Ans (3)



By symmetry f due to charge at E, F, G & H

from face ABCD are equal

ϕ due to charge at

$$E = \underbrace{\left(\frac{q}{8}\right)}_{q_{in}} \times \frac{1}{\epsilon_0} \times \underbrace{\frac{1}{3}}_{3\text{ face}}$$

ϕ due to charge at E, F, G, H =

$$4 \times \frac{q}{24\epsilon_0} = \frac{q}{6\epsilon_0}$$

ϕ due to charge at A, B, C & D = 0

field lines are perpendicular to area vector

29. Ans (1)

$E = \frac{\Delta V}{r} = \frac{800}{2 \times 10^{-2}} = 4 \times 10^4 \frac{N}{C}$

$q.E = mg \Rightarrow q = \frac{1.96 \times 10^{-15} \times 10}{4 \times 10^4}$

$q = 4.9 \times 10^{-19} C$

$q \approx 3e$

30. Ans (4)

The equation of a given progressive wave is

$y = 5 \sin(100\pi t - 0.4\pi x)$ .....(i)

The standard equation of a progressive wave is

$y = a \sin(\omega t - kx)$ .....(ii)

Comparing (i) and (ii), we get

$a = 5$ m, $\pi = 100\pi$ rad s^{-1}, $k = 0.4\pi m^{-1}$

(1) Amplitude of the wave, a = 5 m

(2) Wavelength of the wave, $\lambda = \frac{2\pi}{k} = \frac{2\pi}{0.4\pi} = 5m$

(3) Frequency of the wave, $\upsilon = \frac{\omega}{2\pi} = \frac{100\pi}{2\pi} = 50$ Hz

(4) Velocity of the wave, $v = \upsilon\lambda = (50\ s^{-1})(5m)$

$= 250\ m\ s^{-1}$

31. Ans (4)

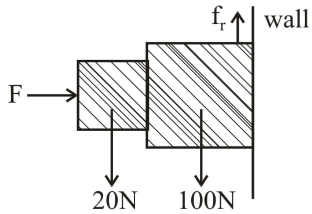
The speed at which the wavefronts move is the speed of sound in air, which is independent of the speed of the source and the location of the observer. So the first choice is incorrect. The observed frequency, however, is determined by the number of wavefronts passing the observer per unit time. So, the more closely the wavefronts are spaced, the higher the frequency. Inspection of the figure shows that the wavefronts are most closely spaced for observer C.

32. Ans (2)

Acceleration, a = (100 – 70) / 20

$a = \frac{3}{2} \Rightarrow S = \frac{1}{2} \times \frac{3}{2} \times 9 = \frac{27}{4} = 6.75$ m

33. Ans (2)



For system of A + B

$F_r = 120N$

34. Ans (2)

After falling a height h, the velocity of ball just at entering the tank water is $\sqrt{2gh}$. As after entering the tank water, the veloicity does not change, this velocity is equal to terminal velocity.

$$\sqrt{2gh} = \frac{2}{9} r^2 \left[\frac{\rho - \sigma}{\eta}\right] g$$

$$2gh = \left[\left(\frac{2}{9}\right)(10^{-4})^2 \frac{(10^4 - 10^3) \times 9.8}{9.8 \times 10^{-6}}\right]^2$$

$\Rightarrow$ h = 20.40 m

35. Ans (3)

$F = 4 - x^2$

F = 0 at x = 2

So speed maximum at x = 2m

$$\frac{3}{2} v \frac{dv}{dx} = 4 - x^2$$

$$\frac{3}{2} \int_0^v v dv = \int_0^2 (4 - x^2) dx$$

$$v^2 = \frac{64}{9}$$

$$K_{max} = \frac{1}{2} \times \frac{3}{2} \times \frac{64}{9} = \frac{16}{3}$$

= 5.33 J

36. Ans (3)

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

$$\Rightarrow \frac{E'}{E} = \frac{a'^2}{a^2} \Rightarrow \frac{E'}{E} = \frac{\left(\frac{3}{4}a\right)^2}{a^2}$$

$$\left(\because\ a' = \frac{3}{4}a\right)$$

$$\Rightarrow E' = \frac{9}{16}E$$

37. Ans (3)

$a_t = 4m/s^2$

$a_c = \frac{v^2}{r} = 3m/s^2$

$a_{net} = \sqrt{a_t^2 + a_c^2} = 5m/s^2$

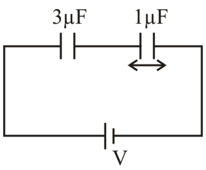
38. Ans (2)

$X_L = 2\pi fL = 1\Omega$

$Z = \sqrt{X_L^2 + R^2} = \sqrt{2}\Omega$

$\cos\phi = \frac{R}{Z} = \frac{1}{\sqrt{2}}$

39. Ans (2)



In series for capacitor

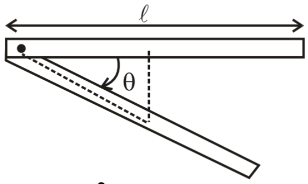
$V \propto \frac{1}{C}$

$V_{1\mu F} = \frac{3}{4}V$

$5 = \frac{3}{4}V$

$V = \frac{20}{3}kV$

40. Ans (4)



$$\frac{1}{2}\left(\frac{m\ell^2}{3}\right)\omega^2 = mg\frac{\ell}{2}\sin\theta$$

$\omega^2\ell = 3g\sin\theta$

$$V_{ind} = \frac{B\omega\ell^2}{2} \propto \left(\frac{g\sin\theta}{\ell}\right)^{1/2}\ell^2$$

$V_{ind} \propto (\sin\theta)^{1/2}$

41. Ans (3)

from conservation of angular momentum

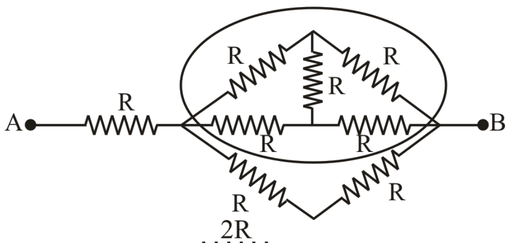
$$\frac{ML^2}{12}\omega_0 = \left(\frac{ML^2}{12} + \frac{2m_0L^2}{4}\right)\omega'$$

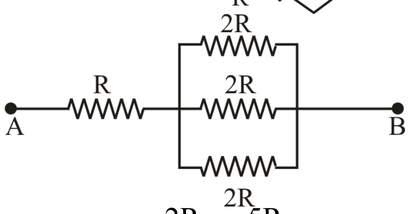
$$\frac{M\omega_0}{12} = \left(\frac{M + 6m_0}{12}\right)\omega'$$

$$\omega' = \left(\frac{M\omega_0}{M + 6m_0}\right)$$

42. Ans (3)

Balanced W.S.B.





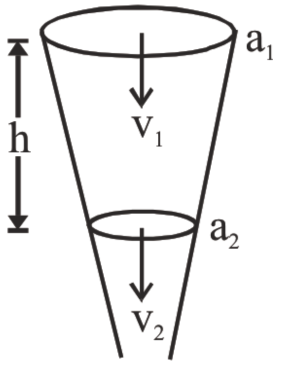
$$R_{AB} = R + \frac{2R}{3} = \frac{5R}{3}$$

43. Ans (4)

Here, $d_1 = 8 \times 10^{-3}$ m

$v_1 = 0.4\ ms^{-1}$

$h = 0.2$ m



According to Bernoulli equation,

$$\frac{1}{2}\rho v_2^2 + 0 + \rho_0 = \frac{1}{2}\rho v_1^2 + \rho gh + \rho_0$$

$$v_2 = \sqrt{v_1^2 + 2gh} = \sqrt{(0.4)^2 + 2 \times 10 \times 0.2} = 2ms^{-1}$$

∴ According to equation of continuity

$a_1 v_1 = a_2 v_2$ (a = area of cross section)

$$\pi \times \left(\frac{8 \times 10^{-3}}{2}\right) \times 0.4 = \pi \times \left(\frac{d_2}{2}\right)^2 \times 2$$

$d_2 = 3.6 \times 10^{-3}$ m.

44. Ans (4)

$v_{rms} = v_{es}$

$$\sqrt{\frac{3\,RT}{(M_0)_{H_2}}} = 11.2 \times 10^3\,m/\,sec$$

$$T = \frac{(11.2 \times 10^3)^2 (2 \times 10^{-3})}{3 \times 8.3}$$

$= 10075$ K

45. Ans (3)

$x = 4\cos(\pi t) + 4\sin(\pi t)$

$$x = 4\sin\left(\pi t + \frac{\pi t}{2}\right) + 4\sin \pi t$$

$$\text{Area} = \sqrt{4^2 + 4^2} = 4\sqrt{2}$$

46. Ans (1)

$KBr + MnO_2 + H_2SO_4$ conc. $\longrightarrow$

$Br_2 + 2KHSO_4 + MnSO_4$

47. Ans (2)

Due to Lanthanoid contraction their is greater decrease in ionic radius of Lanthanide series, because of poor shielding of 4f electrons. Hence the order will be :

$Yb^{+3} < Pm^{+3} < Ce^{+3} < La^{+3}$

48. Ans (2)

$FeCl_3 + K_4[Fe(CN)_6] \longrightarrow Fe_4[Fe(CN)_6]_3$

$(Fe^{+3}$ salt) Prussian blue

$\downarrow K_4[Fe(CN)_6]$

$4KFe[Fe(CN)_6]$

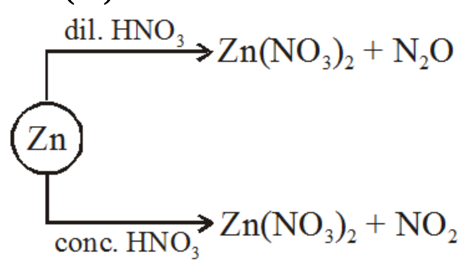
51. Ans (4)

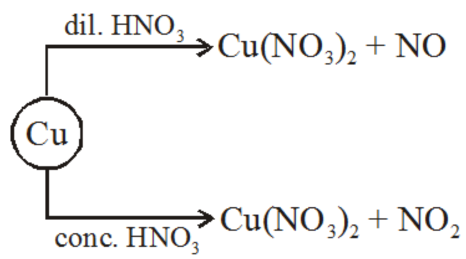
Cryolite (Halide ore) $\longrightarrow Na_3AlF_6$

$$\left.\begin{array}{l}\text{Galena} \rightarrow PbS \\ \text{Cinnebar} \rightarrow HgS\end{array}\right\}\text{Sulphide ore}$$

Bauxite $\longrightarrow Al_2O_3.2H_2O$ (Oxide ore)

52. Ans (2)





57. Ans (1)

The covalent character of ionic compound depends on polarising power of cation.

Order of polarising power : $Be^{+2} > Li^{+} > Na^{+}$

Hence : Order of covalent character :

$BeCl_2 > LiCl > NaCl$

58. Ans (3)

$MnO_4^- + I^- + H^+ \longrightarrow I_2 + Mn^{+2} + H_2O$

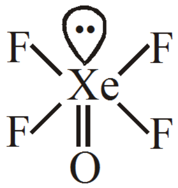
59. Ans (3)

Since magnesium bicarbonate on heating gives insoluble magnesium carbonate, therefore the anion is HCO_3^-.

$MgCl_2 + 2NaHCO_3 \rightarrow Mg(HCO_3)_2 + 2NaCl$

$Mg(HCO_3)_2 \xrightarrow{\Delta} \underset{\text{(white)}}{MgCO_3(sol.)}\downarrow + H_2O + CO_2\uparrow$

60. Ans (1)



76. Ans (2)

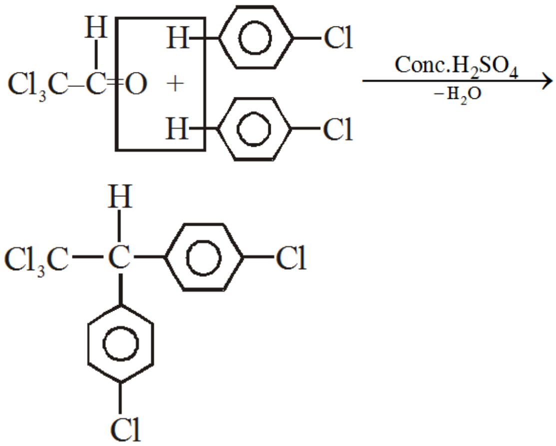
$CH_3\text{–}CH_2\text{–}\overset{O}{\overset{\|}{C}}\text{–}O\text{–}CH_2\text{–}CH_2\text{–}CH_3 \xrightarrow{LiAlH_4}$

$CH_3\text{–}CH_2\text{–}CH_2\text{–}OH + HO\text{–}CH_2\text{–}CH_2\text{–}CH_3$

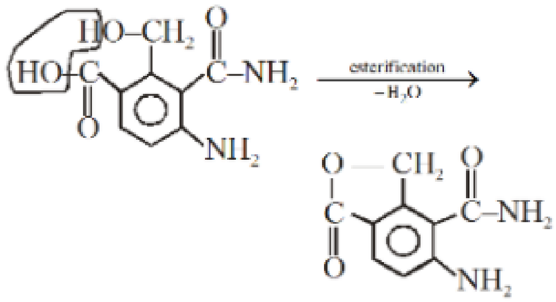
77. Ans (4)

Amide, on reaction with $POCl_3$ or $SOCl_2$ undergoes dehydration to form nitrile.

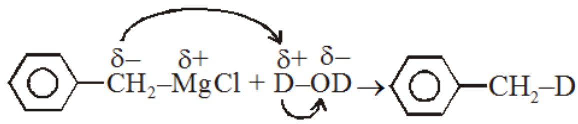
78. Ans (4)



79. Ans (2)



80. Ans (2)

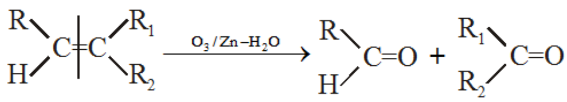


$+ MgCl(OD)$

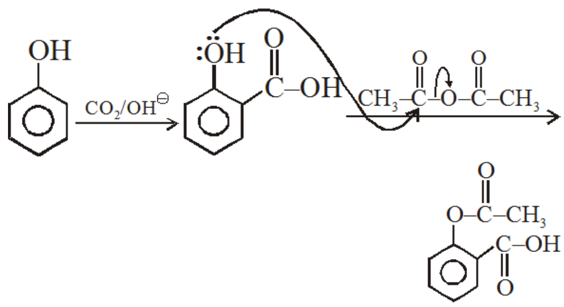
81. Ans (1)

SN^2 reaction is not taking place at chiral 'C' thus configuration remain unchange during course of reaction.

82. Ans (3)



83. Ans (2)



Asprin

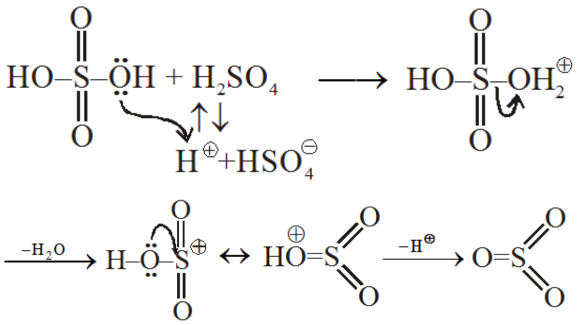
84. Ans (1)

Hypnotic drugs are use to produce sleep.

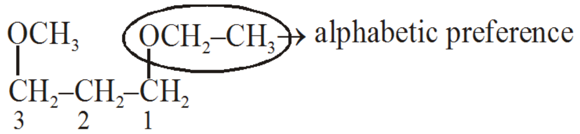
85. Ans (4)

Due to resonance conjugated base of carboxylic acid (carboxylate ion) is more stable.

86. Ans (2)

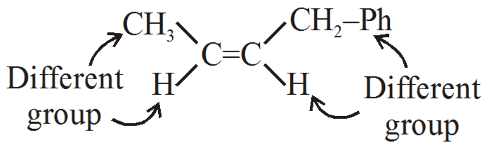


87. Ans (3)



1-Ethoxy-3-methoxy propane

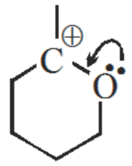
88. Ans (2)



89. Ans (4)

For conversion of alcohol to carbonyl compound (aldehyde) mild oxidising agent (PCC) is most suitable.

90. Ans (4)



Carbocation is 3° as well as resonance stabilized.