Enthusiast, Leader & Achiever course

PHASE : (All Phase)

TARGET : PRE-MEDICAL 2020

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

TEST DATE : 04-07-2020

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.	2	4	4	2	2	2	3	2	2	1	3	1	1	2	4	3	1	4	4	1	2	1	3	3	3	2	1	4	4	2
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.	1	1	2	2	2	4	4	3	1	1	3	2	2	3	2	2	4	4	3	4	2	3	3	1	2	1	4	3	2	3
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	1	3	3	3	4	3	4	3	3	3	2	3	2	3	4	1	2	3	3	4	1	2	3	3	4	4	3	4	2
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.	1	3	2	3	3	1	2	4	4	1	3	4	2	3	3	2	3	2	3	4	3	2	2	2	4	1	4	2	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
A.	3	2	3	2	3	3	1	4	2	3	1	2	4	3	2	1	1	2	4	3	4	3	2	4	4	1	3	4	3	2
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.	2	4	2	4	4	4	4	3	4	4	3	2	2	2	2	3	4	3	2	4	4	1	2	2	3	2	4	2	2	3

HINT – SHEET

1. Ans (2)

$$W = \int_a^d f_x\,dx + \int_b^e f_y\,dy + \int_c^f f_z\,dz$$

Now $\int_a^d f_x\,dx$ is positive since $f_x > 0$ and $d > a$

$\int_b^e f_y\,dy$ is negative since $f_y > 0$; $e < b$

$\int_c^f f_z\,dz$ is negative $f_z < 0$; $f > c$

$W = A_1 - A_2 - A_3$

2. Ans (4)

Given initial velocity $= v_0$

Final velocity =0

Now we know that

$$a = \frac{dv}{dt} = \frac{dv}{dt} \times \frac{dx}{dx} = v\frac{dv}{dx} = -x^2$$

$a = -x^2$

Integrating we get

$$\int_{v_0}^{0} v\,dv = \int_0^x -x^2\,dx$$

$$\left(\frac{v^2}{2}\right)_{v_0}^{0} = -\left[\frac{x^3}{3}\right]_0^x$$

$$-\frac{v_0^2}{2} = -\frac{x^3}{3}$$

$$x = \left(\frac{3v_0^2}{2}\right)^{\frac{1}{3}}$$

3. Ans (4)

Unit of $\frac{C}{\lambda}$ is $\sec^{-1}$ while $\frac{x}{\lambda} \rightarrow$ unit less

4. Ans (2)

$U = \frac{1}{2} CV^2$

$\frac{\Delta U}{U} = \frac{\Delta C}{C} + \frac{2\Delta V}{V}$

$= \frac{0.5}{10} + \frac{1}{20} \times 2 = \frac{3}{20} \Rightarrow 15\%$

5. Ans (2)

$S_1 = 60$ m ; $S_2 = 80$ m ; $S_3 = 100$ m

$V_{avg} = \frac{60 + 80 + 100}{20 + 20 + 20} = \frac{240}{60} = 4$ m/s

6. Ans (2)

$O \rightarrow A$ s v/s t slope is +ve $v \Rightarrow$ +ve

At A s v/s t slope is 0 $v = 0$

$A \rightarrow B$ s v/s t slope is –ve $v =$ –ve

7. Ans (3)

$T_1 = \left(\frac{m_2 + m_3}{m_1 + m_2 + m_3}\right) g$

$= \frac{3 + 5}{2 + 3 + 5} \times 10 = 8N$

8. Ans (2)

$|\vec{a}| = 2$

$\mu_k g = 2$

$\mu_k = 0.2$

9. Ans (2)

$v = \sqrt{2gh} = \sqrt{2 \times 9.8 \times 0.1}$

$= \sqrt{1.96} = 1.4\,m/s$

10. Ans (1)

By symmetry $x_{CM} = \frac{\ell}{2}$

$y_{cm} = \frac{2m\left(\frac{\ell}{2}\right) + m(\ell) + 2m\left(\frac{3\ell}{2}\right) + m(2\ell)}{6m}$

$= \frac{7\ell}{6}$

11. Ans (3)

$\upsilon = \sqrt{Rg \tan\theta}$

$R = 10\sqrt{3}$m, $\theta = 30^\circ$

$\upsilon = \sqrt{10\sqrt{3} \times 10 \times \frac{1}{\sqrt{3}}}$

$= 10$m/sec $= 36$km/hr

12. Ans (1)

Velocity of the system just after the collision

$mv_0 = (m + M)V_1 \Rightarrow V_1 = \frac{mv_0}{(m + M)}$

Using work energy theorem

$\Delta K = W_{All} = W_g + W_N + W_S$

(Assume friction force is absent)

$0 - \frac{1}{2}(m + M)V_1^2 = 0 + 0 - \frac{1}{2} K X_{max^2}$

$\frac{m_0^2 v_0^2}{(m + M)} = KX_{max^2}$

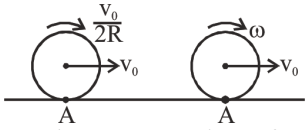
$\Rightarrow X_{max} = \frac{m_0 v_0}{\sqrt{K(M + m)}}$

$= \sqrt{\frac{m_0^2 v_0^2}{K(M + m)}}$

13. Ans (1)

For a particle performing uniform circular motion net torque w.r.t. centre is zero, because line of action of force passes through centre. So angular momentum remains conserved w.r.t. centre.

14. Ans (2)



By the conservation of angular momentum about A

$mv_0 R + \frac{2}{5} mR^2 \frac{v_0}{2R} = mv_{c.m.} R + \frac{2}{5} mR^2 \left(\frac{v_{c.m.}}{R}\right)$

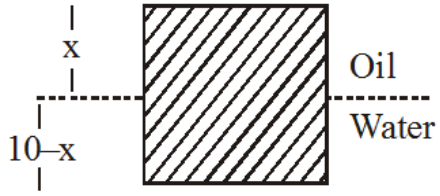
$v_{c.m.} = \frac{6v_0}{7}$

15. Ans (4)

$U_{surface} = \frac{-GMm}{R_e} = -mgR_e$

$U' = \frac{-GMm}{2R_e} = -\frac{mgR_e}{2}$

16. Ans (3)



$(10\times10\times10)(0.7)g$

$= (10\times10)(x)(0.5)g + (10\times10)(10-x)(1)g$

$7 = 0.5\,x + 10 - x$

$\frac{1}{2}x = 3 \quad \Rightarrow \quad x = 6$ cm

17. Ans (1)

P_{excess} for drop $= \frac{2T}{R}$

$= \frac{2(0.072)}{0.6\times10^{-3}} = 240\ N/m^2$

18. Ans (4)

$\frac{dQ}{dt} \propto \frac{A}{L}$

$\Rightarrow \frac{H_1}{H_2} = \frac{A_1}{A_2}\times\frac{L_2}{L_1} = \frac{1}{(2)^2}\times\frac{1}{2} = \frac{1}{8}$

19. Ans (4)

For adiabatic process

$P \propto T^{\frac{\gamma}{\gamma-1}} \quad \gamma_{diatomic} = \frac{7}{5}$

$P \propto T^{\frac{7}{2}}$

20. Ans (1)

$A \rightarrow B$, is an isobaric process,

VaT

So,

$\Delta W_{AB} = nR\Delta T = 2R\,(750-250) = 1000\,R$

$B \rightarrow C$, is an isochoric process

So $\Delta W_{BC} = 0$ and

$C \rightarrow D$, is an isothermal proocess

$\Delta W_{CD} = nRT\ \ln\left\{\frac{V_f}{V_i}\right\}$

$= 2\times R\times 1000\ln\left\{\frac{20}{15}\right\}$

$= 2000R\ln\left\{\frac{4}{3}\right\}$

Total work done, $\Delta W_{AB} + \Delta W_{BC} + \Delta W_{CD}$

21. Ans (2)

$U(x) = U_0(1-\cos\alpha x)$

$F = -\frac{dU}{dx} = -U_0(\alpha\sin\alpha x)$ { F or small x; $\sin\ \alpha x \approx \alpha x$

$F = -U_0\alpha^2(x)$

$K = U_0\alpha^2 \qquad T = 2\pi\sqrt{\frac{m}{U_0\alpha^2}}$

22. Ans (1)

Intensity $\propto$ (amplitude) $^2 \propto (2a\cos kx)^2$

Hence, intensity will be maximum when cos kx is maximum

23. Ans (3)

Here, $\upsilon = 100$ kHz $= 100\times10^3$ Hz

$= 10^5$ Hz $= 10^5\ s^{-1}$

$v_a = 340\ m\ s^{-1}$, $v_w = 1500\ m\ s^{-1}$

Frequency of both the reflected and transmitted sound remains unchanged.

Wavelength of reflected sound,

$\lambda_a = \frac{v_a}{\upsilon} = \frac{340 m\ s^{-1}}{10^5\ s^{-1}} = 34\times10^{-4}$ m

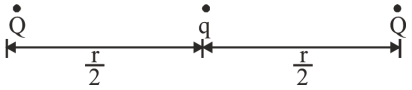
$= 3.4\times10^{-3}$ m $= 3.4$ mm

Wavelength of transmitted sound,

$l_w = \frac{v_w}{\upsilon} = \frac{1500 m\ s^{-1}}{10^5\ s^{-1}} = 15\times10^{-3}$ m

$= 15$ mm

24. Ans (3)



As the system is in equilibrium, the net force on charge Q is zero.

$$\therefore \quad \frac{1}{4\pi\varepsilon_0}\frac{QQ}{r^2}+\frac{1}{4\pi\varepsilon_0}\frac{Qq}{(r/2)^2}=0$$

$$\text{or} \quad q=-\frac{Q}{4}$$

25. Ans (3)

Total charge inside the cube is = q

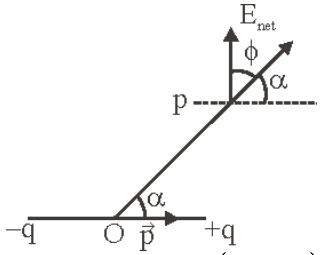
$$\phi_{net}=\frac{q}{\varepsilon_0}$$

OR

Flux through a cube when one charge is at corner is = $\frac{q}{8\varepsilon_0}$

Flux through 8 charges at each corner = $\frac{q}{\varepsilon_0}$

26. Ans (2)



Here $\phi=\tan^{-1}\left(\frac{\tan\alpha}{2}\right) \Rightarrow \tan\phi=\frac{\tan\alpha}{2}$

Here $a+\phi=90$

$\alpha=90-\phi$

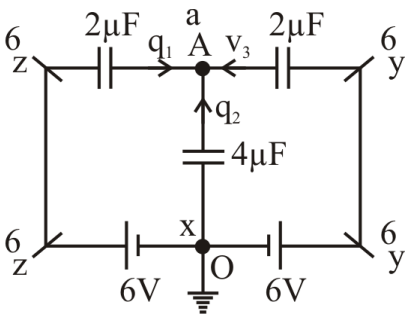
$\tan\alpha=\tan(90-\phi)=\cot\phi$

$\Rightarrow \quad \tan\alpha=\frac{2}{\tan\alpha}$

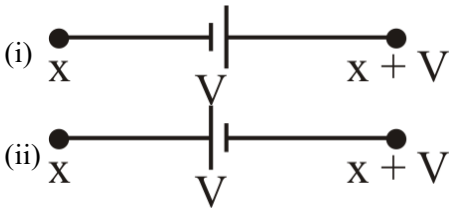
$\Rightarrow \quad \tan^2\alpha=2 \Rightarrow \tan\alpha=\sqrt{2}$

27. Ans (1)

Assume potential of A is a then



Since point x is ground so potential of x can be zero. Now the potential of point y and z would be 6V because (KVL)



$\sum q=0$

$q_1+q_2+q_3=0$

$(a-6)(2)+(a-0)(4)+(a-6)(2)=0$

$2a-12+4a+2a-12=0$

$8a=24$

$a=3$

so charge on C_1 would be

$q_1=(C_1)(\Delta V)$

$=(2)(V_z-V_x)$

$=(2)(3)$

$=6\mu C$

28. Ans (4)

Given circuit is open circuit that why no voltage drop in Resistances so potential difference b/w x & y is 120 volt

29. Ans (4)

$$I=\frac{6}{(1+10)}=\frac{6}{11}\ A$$

$$V=E-Ir=6-\frac{6}{11}\times 1=\frac{60}{11}V$$

30. Ans (2)

$$r = \frac{\sqrt{2mK}}{qB} \text{ i.e. } r \propto \frac{\sqrt{m}}{q}$$

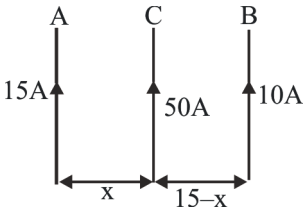
Here kinetic energy K and B are same.

$$\therefore \frac{r_e}{r_p} = \sqrt{\frac{m_e}{m_p}} \times \frac{q_p}{q_e} \Rightarrow \frac{r_e}{r_p} = \sqrt{\frac{m_e}{m_p}} \ (\because q_e = q_p)$$

Since $m_e < m_p$, therefore $r_e < r_p$

31. Ans (1)

$$\frac{F_{AC}}{\ell_1} = \frac{F_{BC}}{\ell_2}$$



$$\frac{\mu_0}{4\pi} \cdot \frac{2 \times 15 \times 50}{x \times 10^{-2}}$$
$$= \frac{\mu_0}{4\pi} \times \frac{2 \times 50 \times 10}{(15 - x) \times 10^{-2}}$$
$$\frac{15}{x} = \frac{10}{(15 - x)}$$

$225 - 15x = 10x \Rightarrow 25x = 225$ or $x = 9$ cm

32. Ans (1)

$$\text{Field at centre } B = \frac{\mu_0 NI}{2a} = \frac{\mu_0 N}{2a} \times \frac{V}{R}$$
$$\therefore V = \frac{2aRB}{\mu_0 N}$$

$$= \frac{2 \times (5 \times 10^{-2}) \times 10 \times (30 \times 4\pi \times 10^{-7})}{(4\pi \times 10^{-7}) \times 5}$$

or $V = 6$ volt

To nullify the horizontal component of magnetic field of the earth, plane of the coil should be normal to magnetic meridian.

33. Ans (2)

By theory

34. Ans (2)

$$P_{in} = V_{in} \times I_{in} = 100 \times 2 = 200 \text{ W}$$

$$P_{out} = \eta P_{in} = 150$$

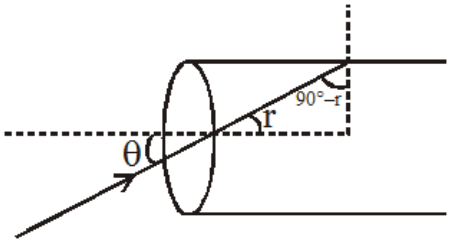
$$\frac{V_0}{V_{in}} = 3 \Rightarrow V_0 = 300 \text{ V and } I_0 = 0.5 \text{ A}$$

35. Ans (2)

$$i = \frac{2\varepsilon}{\sqrt{R^2 + \left[L\omega - \frac{1}{C\omega}\right]^2}}$$

$$\text{Power} = i^2R = \frac{4\varepsilon^2 R}{\sqrt{R^2 + \left[L\omega - \frac{1}{C\omega}\right]^2}}$$

36. Ans (4)



$$90° - r = \theta_C$$

$$\sin(90° - r) = \sin\theta_C \qquad \sin\theta_C = \frac{\sqrt{3}}{2}$$

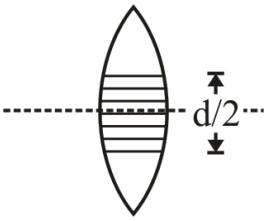
$$\cos r = \frac{\sqrt{3}}{2} \ ; \ \sin r = \frac{1}{2}$$

$$\sin\theta = \frac{2}{\sqrt{3}} \sin r$$

$$\sin\theta = \left(\frac{2}{\sqrt{3}}\right)\left(\frac{1}{2}\right) = \frac{1}{\sqrt{3}}$$

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

37. Ans (4)



Central half is covered area of shaded part = $\frac{\pi}{4}\left(\frac{d}{2}\right)^2$

Remaining area = $\frac{\pi}{4}d^2 - \frac{\pi}{4}\left(\frac{d}{2}\right)^2$

$= \frac{3}{4}\left(\frac{\pi d}{4}\right)^2$

So Remaining intensity = $\frac{3}{4}I$

Focus will be same.

38. Ans (3)

Mirror reflects

39. Ans (1)

Position of central fringe does not change due change in screen distance.

40. Ans (1)

$\tan i = \mu \Rightarrow i = 60°$

So $r = 90° - i = 90° - 60° = 30°$

41. Ans (3)

For e^-; $\lambda e^- = \frac{12.27}{\sqrt{V}}$\AA $\Rightarrow V = \frac{150.6}{\lambda^2_{e(\text{\AA})}}$

$= \frac{150.6}{(0.6)^2}$

Or V = 416.6 V

42. Ans (2)

4×10^3 J = (1020) E_{photon}

$E_{photon} = \frac{4 \times 10^{-17}\ J}{1.6 \times 10^{-19} J}.\ eV = \frac{1}{0.4} \times 10^2\ eV$

$\frac{hc}{\lambda} = 250\ eV \quad \Rightarrow \quad \lambda = \frac{12400}{250} eV$

$\lambda \approx 50$ Å

43. Ans (2)

${}^{A}_{Z}X \rightarrow {}^{A}_{Z+1}Y + \beta^-$

(As Z increase by 1 & no change in A so β decay)

${}^{A}_{Z+1}Y \rightarrow {}^{A-4}_{Z-1}B* + \alpha \left(\begin{array}{l}\text{Z decreases by 2}\\ \text{\& A increase by 4 so } \alpha\end{array}\right)$

${}^{A-4}_{Z-1}B* \rightarrow {}^{A-4}_{Z-1}B + \gamma$(No change in A \& Z)

(atom comes in ground state from excited state so γ decay)

44. Ans (3)

By theory

45. Ans (2)

$I_C R_C = 15 - V_{CE} = 15 - 7 = 8V$

$I_C = \frac{8V}{2k\Omega} = 4mA,$

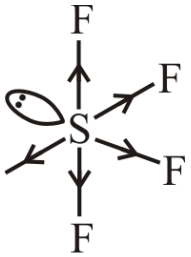
$I_B = \frac{I_C}{\beta} = \frac{4mA}{100} = 0.04mA$

46. Ans (2)

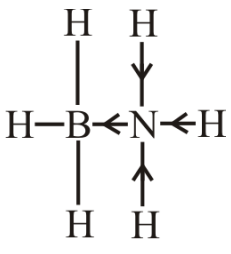
When PBO_2 react with H_2O_2, convert Pb^{+4} into more stable Pb^{+2}, liberating oxygen.

47. Ans (4)

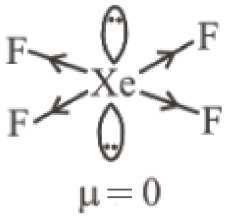
As XeF_4 has square planar shape the dipole moments of Xe-F bonds compensate each other and hence it is non-polar.



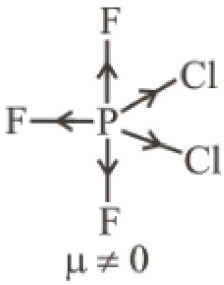
$\mu \neq 0$



$\mu \neq 0$



$\mu = 0$



$\mu \neq 0$

48. Ans (4)

Terbium (Z = 65)

49. Ans (3)

It is a polyprotic acid containing four carboxylic acid groups (acidic hydrogens are red) and two amine groups with lone pair electrons (green dots)

50. Ans (4)

In $SiCl_4$ there is sp^3 hybridisation so the structure is tetrahedral. In SO_4^{2-}, PO_4^{3-}, NH_4^+ the structure is tetrahedral because in all hybridization is sp^3. But in SCl_4, sp^3d hydridisation is present so shape is different which is see saw.

51. Ans (2)

When calcium carbide reacts with nitrogen at 1000°C, calcium cyanamtextde and carbon is formed.

$$CaC_2 + N_2 \xrightarrow{1000°C} \underset{\text{calcium cyanamide}}{CaCN_2} + C$$

52. Ans (3)

$Ni(CO)_4$ is a volatile compound

53. Ans (3)

$p\pi - d\pi$ bond

Cl uses its vacant d-orbitals to form a π with p-orbitals of O.

54. Ans (1)

(i) Role of NaCN in the extraction of silver is to do the teaching of silver ore in the presence of air from which the silver is obtained later by replacement

$4Ag(s) + 8CN^-(aq) + 2H_2O(aq) + O_2(g)$
$\rightarrow [Ag(CN)_2]^-(aq) + 4OH^-(aq)$
$2[Ag(CN)_2]^-(aq) + Zn(s) \rightarrow 2Ag(s) + [Zn(CN)_4]^{2-}(aq)$

(ii) $Ti + I_2 \xrightarrow{\Delta} TiI_4 \xrightarrow{\Delta} Ti + I_2$ (Van-Arkel method)

(iii) In the metallurgy of alumtextnium, cryolite lowers the melting point of the mtextxture and improves the electrical conductivity of the cell.

55. Ans (2)

In Hg(II) $[Co(SCN)_4]$, Co^{2+} has $3d^7$ configuration. SCN^- produces weak ligand field, no pairing of electrons in d-orbitals occurs against Hund's rule, hence :

Co^2 ; $\underset{3d^7}{\boxed{\uparrow\downarrow}\boxed{\uparrow\downarrow}\boxed{1}\boxed{1}\boxed{1}}$; $\mu = \sqrt{3(3+2)}BM$

$\mu \;; = \sqrt{n(n+2)}$

n = No. of unpaired e^-

BM = Bohr's magneton

Co is in + 2 state in this given complex

Co → Atomic number 27

56. Ans (1)

Atomic radius is inversely proportional to nuclear attraction. Al^{3+} has high nuclear charge than Mg^{2+} therefore Al^{3+} has low ionic radius than Mg^{2+}

57. Ans (4)

Na^+ has stable electronic configuration ($1s^2$, $2s^22p^6$). If remove extra electrone that is present in inner shell, so need more energy to remove it. (insufficient amount of energy)

58. Ans (3)

$Al(OH)_3$ formed with NaOH dissolves in excess of NaOH to form aluminate ion. Which is stable.

$AlCl_3 + 3NaOH \rightarrow 2Al(OH)_3\downarrow + 3NaCl$
$Al(OH)_3 + OH^- \rightarrow [Al(OH)_4]^-$
Soluble

59. Ans (2)

HCO_3^- and CO_3^{2-} will produce odourless gas i.e. carbon dioxide with dil. H_2SO_4.

$\underset{\text{Baking soda}}{NaHCO_3}(aq) + H_2SO_4(aq)$
$\rightarrow Na_2SO_4(aq) + 2CO_2(g) + 2H_2O(l)$

$\underset{\text{Washing soda}}{Na_2CO} + H_2SO_4(aq) \rightarrow Na_2SO_4(aq)$
$+ H_2O(l) + CO_2(g)$

60. Ans (3)

M^+ (alkali metal ion) has inert gas configuration. Thus, after M^+ is formed from M (by $(IE)_1$), further ionisation to M^{2+} from M^+ (by $(IE)_2$) requires very high energy.

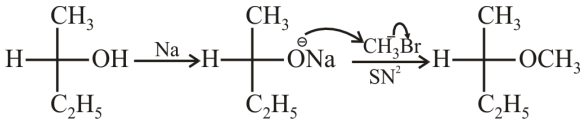
61. Ans (1)

The C-1 carbon of D (+) glucose is called anomeric carbon or glycosidic carbon and the pairs of stereoisomers differ in configuration around C-1 are called anomers.

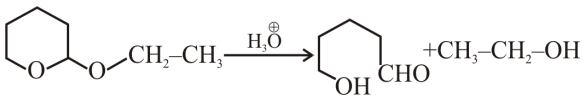
62. Ans (1)

In the presence of peroxy acid (1aq), among c = c and c ≡ c, it is alkene selectely undergo hydroxylation forming diol.

63. Ans (3)



64. Ans (3)



65. Ans (3)

Nitrogen attached to sp^2 hybridized carbon shows + M effect.

66. Ans (4)

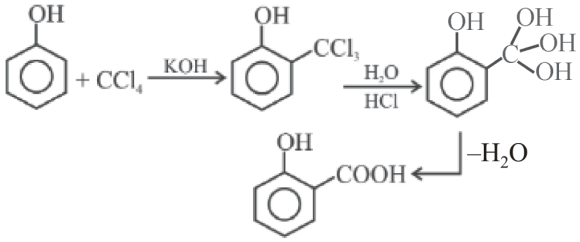
Freons or chlorofluoro carbons are responsible for depletion of the ozone layer in the upper strata of the atmosphere. They are used as propellants, aerosol spray caps. refrigerant, fire fighting reagents etc. They are stable and chemically inert compounds. They absorb UV-radiation and break down libearating free atomic chlorine which causes decomposition of ozone through free radical reaction. This results in the depletion of the ozone layer.

Freons are mainly freon-1 ($CFCL_3$) and freon - 12 (CF_2Cl_2). They form free radical of chlorine in the presence of UV-radiation, Such free radical decomposes O_3 as follows

$$Cl^{\bullet} + O_3 \longrightarrow ClO^{\bullet} + O_2$$
$$ClO^{\bullet} + O_3 \longrightarrow \underset{\text{chlorine free radical}}{Cl^{\bullet}} + 2O_2$$

68. Ans (4)

In Riemer-Tiemen reaction when phenol react with CCl_4 in alcoholic KOH, it forms salicylic acid



69. Ans (3)

Esters having α-Hydrogen give condensation reaction

70. Ans (3)

$$C = \frac{40}{12} = 3.33,\ H = \frac{13.33}{1} = 13.33,$$
$$N = \frac{46.67}{14} = 3.34$$
$$= 1 \qquad = 4 \qquad = 1$$

Emperical formula = CH_4N

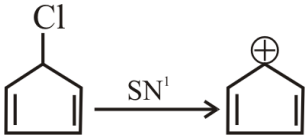
71. Ans (3)

An analgesic drugs is one which relieves or decrease the pain.

72. Ans (2)

The given conversion is effected by only $LiAlH_4$.

73. Ans (3)

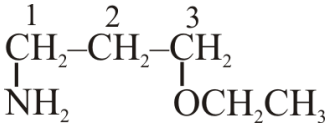


It is anti aromatic

74. Ans (2)

$$HCHO + CH_3CHO \xrightarrow{\bar{O}H} \underset{\underset{OH}{|}}{CH_2–CH_2–CHO}$$
$$2CH_3CHO \xrightarrow{\bar{O}H} \underset{\underset{OH}{|}}{CH_3–CH–CH_2–CHO}$$

75. Ans (3)



76. Ans (4)

$K = Ae^{-\frac{E_a}{RT}}$

$e^{\frac{Ea}{RT}} = \frac{0.01}{100} \Rightarrow \frac{E_a}{RT} = 2.303 \log 10^{-4}$

$\Rightarrow E_a = 2.303 \times 4 \times 400\ R = 30.6 kJ/mol$

77. Ans (1)

$m = \frac{M \times 1000}{(1000 \times d - M \times M.W)}$

$m = \frac{10^{-2} \times 1000}{(1000 \times 1.1) - (10^{-2} \times 106)}$

$= 9 \times 10^{-3}$

78. Ans (2)

Given electron potential data is

$Cl_2 + 2H_2O \rightarrow 2ClO^- + 4H^+ + 2e^-$;

$E° = -1.61$ volt

$ClO^- + 2H_2O \rightarrow ClO_3^- + 4H^+ + 4e^-$;

$E° = -0.50$ volt

For reaction to be spontaneous E^0 reaction should + ve, Thus substracting equation 1 from equation 2.

79. Ans (3)

The change in entropy when the pressure is changed isothermally from P_1 to P_2 is given by relation

$\Delta S = nR\ln (P_1/P_2)$

80. Ans (3)

$\frac{P^0 - P_S}{P^0} = \frac{n_2}{n_1 + n_2}$

$P^0 - P_S = \left[\frac{1}{1 + \frac{1000}{18}}\right] \times 760 = 13.43 mm$

81. Ans (4)

100 g chlorophyll contains 2.68 g

$Mg = \frac{2.68}{24}$ mole Mg

2g chlorophyll contains $\frac{2.68 \times 2}{24 \times 100}$ mole

$Mg = 2.2 \times 10^{-3}$ mole Mg

No. of Mg atoms $= 2.2 \times 10^{-3} \times 6.023 \times 10^{23}$

$= 1.345 \times 10^{21}$ atoms of Mg

82. Ans (1)

$\frac{r_1}{r_2} = \frac{v_1/t}{v_2/t} = \frac{v_1}{v_2} = \sqrt{\frac{M_2}{M_1}}$

Volume of 0.48 g of O_2 at STP

$= \frac{22400}{32} \times 0.48$ mL

(32 g of O_2 occupies 22400 mL at STP)

$\therefore \frac{V_{O_2}}{V_{CO_2}} = \sqrt{\frac{M_{CO_2}}{M_{O_2}}} = \sqrt{\frac{44}{32}} = 1.173$

$V_{CO_2} = \frac{V_{O_2}}{1.173} = \frac{22400}{32} \times \frac{0.48}{1.173}$

$= 286.5$ mL

83. Ans (2)

$NH_4Cl(s) \leftrightharpoons NH_4^+(aq) + Cl^-(aq)$;

$\Delta H = +3.5$ kcal/mol

This is the endothermic reaction hence, increasing the temperature will shift the equilibrium to the right.

84. Ans (3)

$Q > K_{eq}$

Therefore, reaction proceeds in backward direction, i.e., more PCl_5 will be formed.

85. Ans (3)

Most probable radius $= \frac{a_0}{Z}$

where $a_0 = 52.9$ pm. For helium ion, $Z = 2$.

$r_{mp} = \frac{52.9}{2} = 26.45$ pm

86. Ans (4)

Osmotic pressure = iCRT, For both the solutions, all other conditions are same except i which is 1.0 for sucrose while 2.0 for NaCl.

Therefore, osmotic pressure of NaCl

$= 2 \times 0.25$

$= 0.50$ atm

88. Ans (3)

$$2Al + 3Cl_2 \rightarrow 2AlC$$

Moles before reaction	1.0	3.0	0
Moles after reaction	0	1.5	1

Mole ratio for reactants and products are

2 : 3 : 2

Thus limiting reagent is Al.

Moles of $AlCl_3$ formed = 1.0

Moles of excess reagent Cl_2 left unreacted = 1.5

89. Ans (4)

$$6HCHO \leftrightharpoons C_6H_{12}O_6$$

Conc. at equilibrium $C(1-\alpha)$ $\quad \frac{C\alpha}{6}$

$$\alpha = \frac{M_{Tb} - M_{obs}}{(n-1)M_{obs}}$$

$$= \frac{30 - 150}{\left[\frac{1}{6} - 1\right] 150}$$

$$= \frac{120}{\frac{5}{6} \times 150} = 0.96$$

90. Ans (2)

$$NH_4^+ + H_2O \leftrightharpoons NH_4OH + H^+$$

$$k_{eq} = \frac{[NH_4OH][H^+]}{[NH_4^+]} \times \frac{[OH^-]}{[OH^-]}$$

$$k_{eq} = \frac{k_w}{k_b}$$

$$\Rightarrow 5.5 \times 10^{-10} = \frac{10^{-14}}{k_b}$$

$$k_b = \frac{10^{-14}}{5.5 \times 10^{-10}} = 1.8 \times 10^{-15}$$

105. Ans (3)

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109. Ans (3)

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115. Ans (4)

NCERT-XI Pg. # 67(E/H)

120. Ans (2)

NCERT XII, Pg # 157

122. Ans (2)

NCERT XIth Pg. # 116

132. Ans (2)

NCERT XI Pg. # 132

133. Ans (4)

NCERT-XI, Pg. # 132, Para-3, Line-12, 13, 14, 15

134. Ans (3)

NCERT Pg. # 134,135

135. Ans (2)

NCERT XI, Page # (E/H) 163,164

139. Ans (4)

NCERT Pg. # 174, 175, table 9.1, 9.2

141. Ans (4)

Module 1 Pg.# 7, 8

142. Ans (3)

NCERT Pg # 20

149. Ans (3)

NCERT–XI, Pg. # 146

168. Ans (3)

NCERT-XI Pg. # 231

172. Ans (1)

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176. Ans (2)

NCERT Pg.# 267