SAKSHI JEE MAIN MOCK TEST-1 KEY SHEET

MATHEMATICS:-

1)1	2)1	3)2	4)3	5)1	6)2	7)3	8)4	9)2	10)3
11)2	12)1	13)4	14)3	15)3	16)3	17)2	18)1	19)1	20)3
21)4	22)4	23)2	24) 3	25)1	26)2	27) 2	28)1	29)4	30)1

PHYSICS:-

31)3	32)4	33)2	34)3	35)2	36)1	37)1	38)3	39)2	40)4
41)3	42)2	43)2	44)3	45)2	46)4	47)1	48)4	49)1	50)3
51)1	52)3	53)1	54)4	55)1	56)1	57)1	58)1	59)3	60)1

CHEMISTRY:-

61)3	62)4	63)1	64)3	65)4	66)3	67)4	68)3	69)1	70)4
71)3	72)1	73)3	74)3	75)3	76)1	77)3	78)2	79)3	80)3
81)3	82)2	83)2	84)4	85)0	86)2	87)2	88)3	89)3	90)1

JEE-MAIN MOCK TEST-1 Solutions

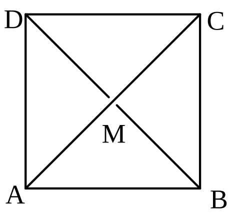
MATHEMATICS

1. $\overline{OM_1} = \overline{OM} + \overline{MA} + \overline{OM} + \overline{MB} + \overline{OM} + \overline{MC} + \overline{OM} + \overline{MD}$

$= 4\overline{OM} + \left(\overline{MA} + \overline{MC}\right) + \left(\overline{MB} + \overline{MD}\right)$

$= 4\overline{OM} + \overline{O} + \overline{O}$

$= \overline{OM} = \frac{1}{4}\overline{OM}_1$



2. $x + 2y + 3z - \frac{(5+7)}{2} = 0$

3. $v = \frac{4}{3}\pi r^3$

$\frac{dv}{dt} = 4\pi r^2 \frac{dr}{dt}$

$\frac{50}{4\pi(10+5)^2} = \frac{dr}{dt}, \frac{dr}{dt} = \frac{50}{4\pi(225)} = \frac{1}{18\pi} cm/\min$

4. To make reflexive (2,2) (3,3)(4,4) symmetric (3,2) (4,3) Transitive (2,4) (4,2)

$\therefore 7$ must be added

5. Point on the line (2,1,-2) lies on the plane $\Rightarrow 2\alpha+\beta=-5$

Normal perpendicular to the given line

$\Rightarrow 3(1)+(-5)(3)+2(-\alpha)=0$

$\Rightarrow \alpha=-6, \beta=7$

6. $\alpha+\beta+v=a \qquad \alpha\beta v=8$

$\alpha+\beta+v \geq 3\sqrt[3]{\alpha\beta v}$

$\geq 3(2)$

≥ 6

7. $(1-1+2-2+......+n-n)^2$

$=2(1^2+2^2+......n^2)+2S$

S is the required product

$$0=\frac{n(n+1)(2n+1)}{6}+S$$

$$S=\frac{-n(n+1)(2n+1)}{6}$$

8. $f(x)=lx^2-mx+5$ does not have

Distinct real roots $\Rightarrow f(x)\leq 0 \; or \geq 0 \forall x \varepsilon R$

$f(0)=5>0$

$f(-5)\geq 0$

$25l+5m+5\geq 0$

$\Rightarrow 5l+m\geq -1$

-1 is the minimum

9. $C=\left(2,\frac{3}{2}\right) \; r=\frac{5}{2}$

$$m=\frac{3}{4},\; y-\frac{3}{2}=\frac{3}{4}(x-2)\pm\frac{5}{2}\sqrt{1+\frac{9}{16}}$$

10. $A=\tan^{-1}\frac{1}{\sqrt{\tan\theta}}-\tan^{-1}\sqrt{\tan\theta}$

$$A=\tan^{-1}\left(\frac{1-\tan\theta}{2\sqrt{\tan\theta}}\right)$$

$$\tan\frac{\left(\frac{\pi}{2}-A\right)}{2}=\sqrt{\frac{1-\cos(\pi/2-A),}{1+\cos(\pi/2-A),}}=\sqrt{\frac{1-\sin A}{1+\sin A}}$$

$$=\sqrt{\frac{1-\frac{(1-\tan\theta)}{(1+\tan\theta)}}{1+\frac{(1-\tan\theta)}{(1+\tan\theta)}}}$$

$=\sqrt{\tan\theta}$

11. L_{11}, L_{22} will have with the same sign

$L_{11}=0+0+1>0$

$L_{22}=a^2+ab+1>0$

$\Rightarrow b^2 - 4 < 0$

$-2 < b < 2 \quad but\ b > 0$

$\Rightarrow b \in (0,2)$

12. $P^T P = I$

$P^T Q = P^T PAP^T = AP^T$

$P^T Q Q^{2004} P = AP^T Q^{2004} P$

$= AP^T Q\ Q^{2003} P$

$= A^2 P^T Q^{2003} P (so\ on\ like\ this)$

$= A^{2005} P^T P$

$= A^{2005}$

$= \begin{bmatrix} 1 & 2005 \\ 0 & 1 \end{bmatrix}$

13. From truth table, r is not equivalent to q or p and $\sim(p \leftrightarrow \sim q)$

14. $\dfrac{3x-4}{3x+4} = y$

$\dfrac{6x}{-8} = \dfrac{y+1}{y-1}$

$x = \dfrac{-4}{3}\left(\dfrac{y+1}{y-1}\right)$

$f(y) = \dfrac{-4}{3}\left(\dfrac{y+1}{y-1}\right) + 2$

$= \dfrac{2y-10}{3(y-1)}$

$\int f(x)dx = \dfrac{2(x-1)}{3(x-1)} - \dfrac{8}{3(x-1)}$

$\dfrac{2}{3}x - \dfrac{8}{3}\log(x-1) + c$

15. $B(0,b)$

Focal distance a+e(o)=k

a=k

2ae =2h

ae=h

$b^2 = a^2(1-e^2)$

$b^2 = k^2 - h^2$

16. $\underset{x\to\pi/2}{Lt} \dfrac{\tan\left(\dfrac{\pi}{4}-\dfrac{x}{2}\right)}{\pi - 2x} \quad \dfrac{1-\cos\left(\dfrac{\pi}{2}-x\right)}{(\pi-2x)^2}$

$\dfrac{\tan\left(\dfrac{\pi}{4}-\dfrac{x}{2}\right)}{4\left(\dfrac{\pi}{4}-\dfrac{x}{2}\right)} \dfrac{1-\cos\left(\dfrac{\pi}{2}-x\right)}{4\left(\dfrac{\pi}{2}-x\right)^2}$

$= \dfrac{1}{16}(1)\dfrac{1}{2} = \dfrac{1}{32}$

17. $I = \int_0^{\pi} (\pi - x) f(\sin^3 x + \cos^2 x) dx$

$2I = \pi \int_0^{2\pi/2} f(\sin^3 x + \cos^2 x) dx$

$2I = 2\pi \int_0^{\pi/2} f\left(\sin^3 x + \cos^2 x\right) dx$

$k = \pi$

18. $p = \frac{1}{2}$

$q = \frac{2}{6}$

$P(E) = p + \bar{p}\,\bar{q}\,p + \bar{p}\,\bar{q}\,\bar{p}\,\bar{q}\,p = \frac{p}{1 - \overline{p}\overline{q}} = \frac{\frac{1}{2}}{1 - \frac{1}{2}\frac{4}{6}}$

$= \frac{3}{4}$

19. A,B,C are collinear

$\Rightarrow B = \frac{A + C}{2}$

$\left(2y, 2(z + x)\right) = (x + z, 2y + z + x)$, $2y = x + z$, $2z + 2x = 2y + z + x$

$\Rightarrow$ $z + x = 2y$ x ,y , z are in A.P

20. $n_{c_1} a^{\frac{n-1}{13}} (a\sqrt{a})^1 = 14a^{\frac{5}{2}}$

If n=14

The above is true

$\frac{n_{c_3}}{n_{c_2}} = 4$

21. p=1, q=2 or 3 or 4 or 5 = 4

P=2 q=3,4,5 =3

P=3 q=4 or 5 =2

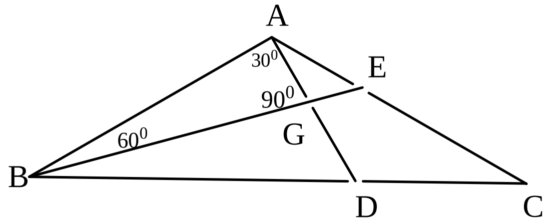
P=4 q= 5 =1

m = (4+3+2+1)-1=9 [2/4=1/2]

$n = 2^3 - 2 = 6$

$m - n = 9 - 6 = 3$

22.



$\frac{AG}{\sqrt{3}/2} = \frac{BG}{\frac{1}{2}} \Rightarrow \frac{2(4)}{3\sqrt{3}} = BG$

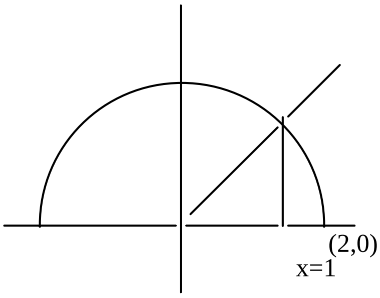
$BG = \frac{8}{3\sqrt{3}}$

$\Delta = 3(area\ \ of\ \ AGB)$

$= 3\frac{1}{2}(BG)(AG)$

$$= 3\frac{1}{2}\frac{8}{3\sqrt{3}}\frac{2}{3}(4) = \frac{32}{3\sqrt{3}}$$

23.



$$\sqrt{4-x^2} = x\sqrt{3}$$

$$\Rightarrow x = 1$$

$$Area = \int_0^1 \sqrt{3}x + \int_1^2 \sqrt{4-x^2}\,dx$$

$$= \left[\frac{\sqrt{3}}{2}x^2\right]_0^1 + \left[\frac{x}{2}\sqrt{4-x^2} + \frac{4}{2}\sin^{-1}\frac{x}{2}\right]_1^2$$

$$= \frac{2\pi}{3}$$

24. $|z-1| + |z+3| \le 8$

$\Rightarrow Z$ lies inside or on the ellipse with foci (-3,0)(1,0)

2a=8

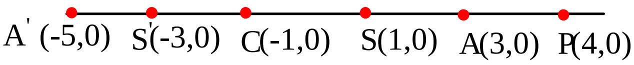
a=4

Centre = (-1,0)

Vertices (3,0) (-5,0)

$|z-4|$ is the distance from Z to (4,0)

Max = 9 Min = 1



$$|A| = 10$$

25.

$$adjA = \begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & 5 \\ 1 & -2 & 3 \end{bmatrix}$$

$$A^{-1} = \frac{1}{10}adjA$$

$$B = \frac{1}{10}\begin{bmatrix} 4 & 2 & 2 \\ -5 & 0 & \alpha \\ 1 & -2 & 3 \end{bmatrix}$$

$$\Rightarrow \alpha = 5$$

26. $op = \sqrt{x^2 + y^2}$

$$= \sqrt{a^2 + b^2 - 2ab\cos\left(\frac{at}{b} - t\right)}$$

$$\le \sqrt{a^2 + b^2 + 2ab}, \left(-\cos\left(\frac{at}{b} - t\right) \le 1\right)$$

$$\le a + b$$

27. Equation of parabola

$$\Rightarrow\left(x+\frac{3}{2}\right)^2+(y+3)^2=\frac{(2x+5)^2}{4}$$

$$(y+3)^2=2(x+2)$$

$$x+2=\frac{1}{2}t^2$$

$$=2\left(\frac{t}{2}\right)^2$$

$$x=2\left(\frac{t}{2}\right)^2-2\left(let\ \frac{t}{2} is\ some\ t\right)$$

$$\therefore x=2t^2-2$$

$$y+3=2\frac{1}{2}t$$

$$y=2\left(\frac{t}{2}\right)-3$$

$Let\frac{t}{2}$ is some t .y=2t-3

28. $$\frac{\Sigma xi}{25}=78.4$$

$$\Sigma xi=1960$$

Correct value of $\Sigma xi=1960+96-69=1987$

Correct mean $\frac{1987}{25}=79.48$

29. $$x+\frac{1}{x}\geq 2\ or\ \leq -2$$

$\therefore \cos\theta$ is not possible for any value of θ

30. $$\log(x+y)-2xy=0$$

$$x=0\Rightarrow \log y=0$$

$$y=1$$

$$\frac{1}{x+y}\left[1+y^1\right]=2\left[xy^1+y\right]$$

$$if\quad x=0,\ y=1$$

$$1(1+y^1)=2(0+1)$$

$$y^1=2-1=1$$

PHYSICS

31. (3) Net force acting on the rope = (acceleration) system x (mass) rope = $\frac{Fm}{M+m}$

$$a_{system}=\frac{F}{M+m}$$

32. (4) $\frac{1}{f}=(\mu-1)\left(\frac{1}{R_1}+\frac{1}{R_2}\right)$ and $\frac{1}{F}=\frac{1}{f_1}+\frac{1}{f_2}+\frac{1}{f_3}$

33. (2) The rate at which total mechanical energy dissipates with time is equal to the work done by the dissipative force per unit time.

$$\Rightarrow P_{dissipative} = fV = f\left(at\right)$$

$$\Rightarrow P_{dissipative} = \mu mtg\cos\alpha\left(g\left(\sin\alpha - \mu\cos\alpha\right)\right)$$

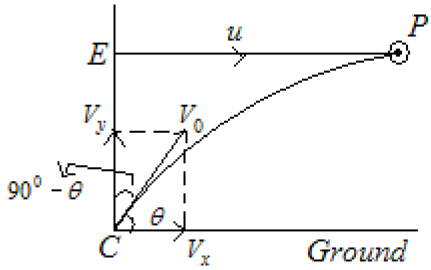
34. (3) Let the shell hit the plane at P and t be the time taken for the shell to hit the plane.

The horizontal distance traveled by the shell = $EP = u\times t = V_x.t = V_0\cos\theta t$ as $V_x = V\cos\theta$

$\mu = 300m/s, V = 600m/s$

$$\therefore \cos\theta = \frac{u}{V_0} = \frac{300}{600} = \frac{1}{2} = \cos 60^0 \quad \therefore \theta = 60^0$$

$\therefore$ Angle with the vertical = $90^0 - \theta = 30^0$



35. (2) Fringe width $\delta = \dfrac{\lambda D}{d}\delta \propto \lambda$

So, δ decreases by a factor $\dfrac{2}{3}$ so no. of fringes in the same segment increases by a factor $\dfrac{3}{2}$

36. (1) $K = \dfrac{2\pi}{\lambda} = \dfrac{\pi}{3} \Rightarrow \lambda = 6cm$

Distance between adjacent nodes $= \dfrac{\lambda}{2} = \dfrac{6}{2} = 3cm$

37. (1) Compare the given equation from

$$y = \frac{a}{b + \left(x \mp ct\right)^2},\ \left(x \mp ct\right)^2 = \left(x - 1\right)^2$$

Ct = 1 for t = 2 sec, so, C = $\dfrac{1}{2}$ cm/sec

38. (3) $\left[2mgb + mg\left(3b\right)\right] = \left[2m\left(b^2\right) + m\left(3b\right)^2\right]\alpha\left\{u\sin g\ \tau = I_{system}\alpha\right\}$

$$\Rightarrow \alpha = \frac{5g}{11b}$$

39. (2) $f_{open} = \left(n+1\right)\dfrac{c}{2l}$, $f_{closed} = (2n + 1)\dfrac{c}{4l}$

$$\frac{f_{open}}{f_{closed}} = \frac{2\left(n+1\right)}{2n+1}$$

40. (4) $c = \sqrt{\dfrac{2GM_{star}}{R}}$

$$\Rightarrow 3\times10^8 = \sqrt{\frac{2\left(6.67\times10^{-11}\right)\left(3\times2\times10^{30}\right)}{R}}$$

$$\Rightarrow R = 9\,km$$

41. (3) Since $V^2 = 1^2 + 2\left(g\right)\left(0.15\right)$ $\quad \left\{\because v^2 - u^2 = 2as\right\}$

$$\Rightarrow v^2 = 4$$

$$\Rightarrow v = 2ms^{-1}$$

Further according to equation of continuity

$$A_1 u = A_2 v$$

$$\Rightarrow 10^{-4}\left(1\right) = A_2\left(2\right)$$

$$\Rightarrow A_2 = 5\times10^{-5} m^2$$

42. (2) $\left(\frac{c}{c-v_s} - \frac{c}{c+v_s}\right) n = \text{f}_{\text{beats}} \Rightarrow \text{f}_{\text{beats}} = \frac{2cv_s}{c^2 - vs^2}$ $\quad$ $\text{n} = \left(\frac{2\times330\times2}{330^2 - 4}\right)\times330 = 4$

43. (2) $v = u - at,\ 0 = 9 - 2t, t = 4.5\,\text{sec}$

velocity will be zero at 4.5 sec. Then use $s = ut + \frac{1}{2}gt^2$

44. (3) $\frac{\sqrt{v_1}}{\sqrt{v}} = \frac{(Z_1 - 1)}{(11-1)}$

$Z_1 = 6$

45. (2) Tangential velocity of the rope, $\text{v} = \text{r}\omega$

Tangential acceleration , $\text{a} = \frac{\text{dv}}{\text{dt}} = \frac{\text{d}}{\text{dt}}(\text{r}\omega) = \omega\frac{\text{dr}}{\text{dt}}$

Here $\omega = 2\pi\text{n}$ and $\frac{\text{dr}}{\text{dt}} = \text{nd}$

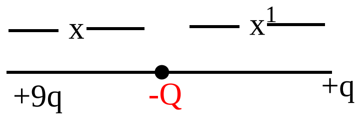
$\therefore \text{a} = 2\pi\text{n}^2\text{d}$

$\therefore \text{T} = \text{w}\left(1+\frac{\text{a}}{\text{g}}\right) = \text{w}\left(1+\frac{2\pi\text{n}^2\text{d}}{\text{g}}\right)$

46. (4) $\vec{A} = 100\vec{k}$

$\phi = \vec{E}.\vec{A} = \left(3\bar{i} + 4\bar{j} + 8\vec{k}\right).100\vec{k} = 800\,Nm^2c^{-1}$

47. (1) For the charges to be in equilibrium, net force on any point charge should be zero



$$x^1 = \frac{d}{\sqrt{\frac{Q^1}{Q}} + 1}$$

$$x^1 = \frac{d}{\sqrt{\frac{9q}{q}} + 1} = \frac{d}{4}$$

$$x = d - x^1 = d - \frac{d}{4} = \frac{3d}{4}$$

48. (4)

$$v = \sqrt{\frac{2qV}{m}}$$

49. (1) Induced emf = $\int_a^b \text{Bvdt} = \frac{\mu_o \text{Iv}}{2\pi}\ln\frac{\text{b}}{\text{a}}$

Power dissipated = $\frac{\text{E}^2}{\text{R}} = \vec{\text{F}}.\vec{\text{v}} \Rightarrow \text{F} = \frac{\text{E}^2}{\text{vR}}$

50. (3) Energy stored in the inductor = heat produced $= \frac{1}{2}Li_0^2 = \frac{1}{2}L\left(\frac{E}{R_1}\right)^2 = \frac{1}{2}L\frac{E^2}{R_1^2}$

51. (1) $\frac{[\text{dv}]}{\left[\text{v}^2\right]} = \left[\text{a}^\text{n}\right] \Rightarrow \text{n} = 0$

52. (3) $\frac{dt}{dx} = 2ax\frac{dx}{dt} + b\frac{dx}{dt} \Rightarrow v = \frac{dx}{dt} = \frac{1}{(2ax+b)} \Rightarrow \frac{d^2x}{dt^2} = \frac{-2a}{(2ax+b)^3} = -2av^3$

53. (1) $v_{A0} = 0$

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

$\frac{V_{A1}}{V_{A2}} = \frac{3}{3+2} = \frac{3}{5}$

$v_{A1} = 3x\frac{v}{5} = 0.6v$

54. (4) Limiting friction between the blocks $= 4mg = 0.5\times5\times10 = 25N$

Acceleration of upper block $= \frac{25-15}{5} = 2m/s^2$

Lower block will also move the same acceleration

$\therefore F - 25 = 10\times2$

$F = 45N$

55. (1) $\frac{MV^2}{r} = qVB$

$r = \frac{MV}{qB} \Rightarrow r^2 = \frac{M^2V^2}{qB}$

$r^2 = \frac{2M(KE)}{qB}$

56. (1) $\frac{dT}{dt} = \frac{1}{C} KA\left[\left.\frac{dT}{dx}\right|_{x=A} - \left.\frac{dT}{dx}\right|_{x=B}\right]$

$= 24\ ^0C / sec$

57. (1) $C_P = \frac{P}{\frac{dT}{dt}}$

where $\frac{dT}{dt} = \frac{a^4}{4T^3}$

58. (1)

Total decay constant is $\frac{1}{1620} + \frac{1}{405} = \frac{1}{324}$

$\frac{No}{4} = N_0e^{-\lambda t} \Rightarrow$ t = 449 years

59. (3) Invar steel is used to prepare pendulum clock because its coefficient of linear expansion is very low.

60. (1) Platinum is used to fuse into glass because both have almost the same coefficient of linear expansion.

CHEMISTRY

61. Meq of salt = Meq of Na_2SO_3

$50\times0.1\times n = 25\times0.1\times2$

$\therefore$ $n = 1$ $[\text{change in (O.N.)}]$

$\therefore$ $M^{3+} + e^- \longrightarrow M^{2+}$

62. Allotropes of an element have the same chemical properties but have different arrangement of atoms and physical properties.

63. It undergoes dehydration easily as the product obtained is conjugated, and is more stable.

64. Polarity in a molecule gives rise to an increase in forces of attraction among molecules and thus, the boiling point increases.

65. Being amphoteric , $Al(OH)_3$ is soluble in NaOH solution whereas $Fe(OH)_3$ is insoluble.

66. $CaC_2 \xrightarrow{H_2O} C_2H_2 \xrightarrow[Hg^{2+}(\text{catalyst})]{H_2O} CH_3CHO \xrightarrow[Ni]{H_2} CH_3CH_2OH$

67. Let *w* g of each be taken, then initial mole of $P = \frac{w}{10}$; mol of $Q = \frac{w}{20}$

Final mole of $P = \frac{w_1}{5\times10}$ Final mole of $Q = \frac{4w_1}{20\times5}$

For P $\frac{P_{N_0}}{P_N} = e^{\lambda_1 t}$ For Q $\frac{Q_{N_0}}{Q_N} = e^{\lambda_2 t}$

$\therefore$ For P $\frac{w\times5\times10}{10\times w_2} = e^{\lambda_1\times20}$

For Q $\frac{w\times20\times5}{20\times w_1\times4} = e^{\lambda_2\times20}$

By Eqs. (i) and (ii) $4 = e^{(\lambda_1-\lambda_2)\times20}$

$\therefore$ $20(\lambda_1-\lambda_2) = \log_e 4$

or $20\left(\frac{0.693}{10} - \frac{0.693}{t_{1/2}}\right) = \log_e 4$

$\therefore$ $t = \infty$

68. $FeSO_4\cdot7H_2O \xrightarrow{\Delta} FeSO_4 + 7H_2O;$

$2FeSO_4 \xrightarrow{\Delta} Fe_2O_3 + SO_2 + SO_3$

69.

$\underset{(A)}{C_3H_6Cl_2} \xrightarrow{KOH(aq)} \underset{(B)}{C_3H_6O}$

or

$\underset{(A)}{C_3H_6Cl_2} \xrightarrow{KOH(alc)} \underset{(C)}{C_3H_4}$

$CH_3C\equiv CH \xrightarrow[H^+.Hg^{2+}]{H_2O} CH_3COCH_3 \xrightarrow[+NaOH]{Br_2} CHBr_3 + CH_3COONa$

Since, B and D are different, thus B is CH_3CH_2CHO and so A is $CH_3CH_2CHCl_2$.

70. Higher vapour pressure of H_2O in atomosphere will drive H_2O vapours to the solute particles.

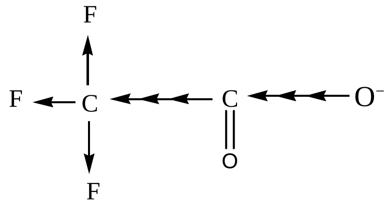
71. $HO{-}SO_2OH + PCl_5 \longrightarrow Cl{-}SO_2Cl + POCl_3 + 2HCl$

72. must be a tertiary alcohol as it gives alkene on treatment with Cu. Thus, C_4H_8O is a ketone.

73. phenomenon of conversion of freshly precipitated mass into colloidal state by the action of solute or solvent is called peptization.

74. The solubility of noble gases increases with increase in molecular weight due to increase in van der Waals' forces. However, these are sparingly soluble.

75. Follow applications of inductive effect. The negative charge on carboxylate ion is dispersed more due to $-IE$ of F atom.



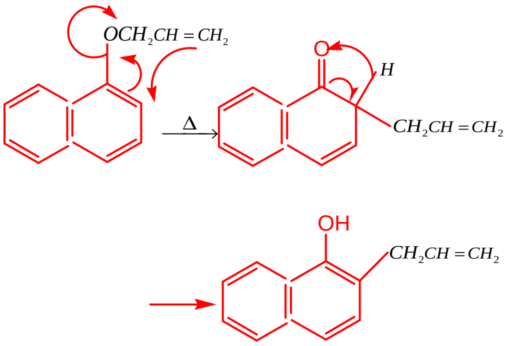
The carboxylate ion thus becomes more stable and the acid becomes more reactive.

76. $\frac{-d[N_2O_5]}{dt} = \frac{1}{2}\frac{d[NO_2]}{dt} = \frac{2d[O_2]}{dt}$

$\therefore k_1[N_2O_5] = \frac{k_2}{2}[N_2O_5] = 2k_3[N_2O_5]$

77. According to Werner's theory, only those ions are precipitated which are attached to the metal atoms with ionic bonds and are present outside the coordination sphere.

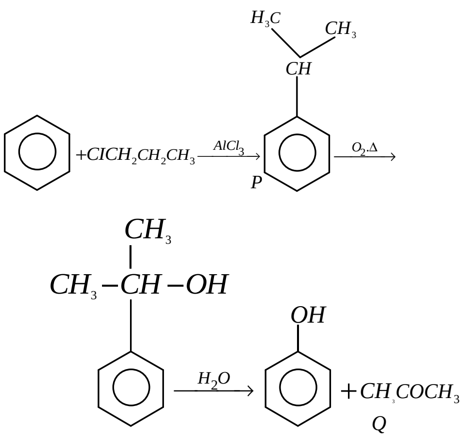
78.



79. $K_c = \frac{[NO_2]^2}{[N_2O_4]} = \frac{\left[2\times10^{-3}/2\right]^2}{\left[\frac{0.2}{2}\right]} = 1\times10^{-5}$

80. PbS is black and S^{2-} reacts with $K_2Cr_2O_7$ to give $Cr_2(SO_4)_3$ solution which is green.

81.



82. For NaX,

$$\underset{1-h}{X^-} + H_2O \rightleftharpoons \underset{h}{HX} + \underset{h}{OH^-}$$

$$\therefore\ h = \sqrt{\frac{K_h}{C}} = \sqrt{\frac{K_w}{K_a \cdot C}} = \sqrt{\frac{10^{-14}}{10^{-5}\times 0.1}}$$

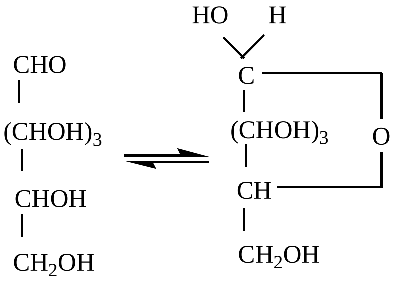
$$= \sqrt{10^{-8}} = 10^{-4}$$

$$\therefore\ \%H = 10^{-4}\times 100 = 10^{-2} = 0.01$$

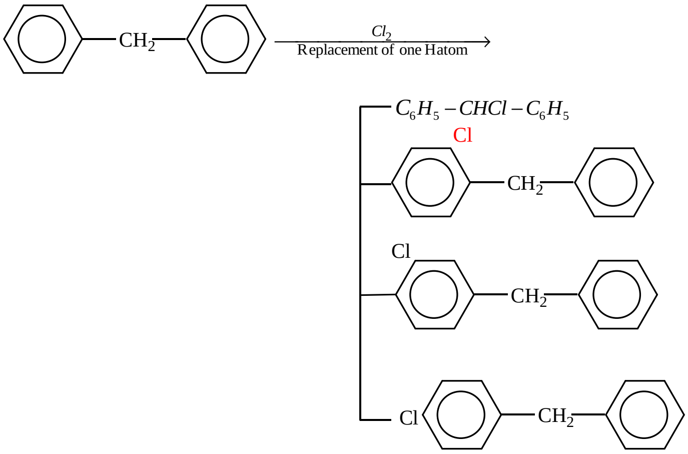
83. $E_{cell} = \frac{0.059}{2}\log\frac{\left[H^+\right]^2_{RHS}\times p_{H_2(LHS)}}{p_{H_2(RHS)}\times\left[H^+\right]^2_{LHS}}$

Thus, for positive E_{cell}, $P_{H_2(LHS)} > P_{H_2(RHS)}$

84.



85. Conceptual



86.

87. DNA has deoxyribose sugar; RNA has ribose sugar with three bases common as adenine, guanine and cytosine, DNA has fourth base thymine; RNA has uracil

88. This gives rise to higher e nuclear charge in Na^+ and the size of Na^+ becomes smaller due to more effective pull of valence shells towards nucleus.

89. In D-(+)-tartaric acid, the (+) is due to positive optical rotation and is derived from $D-(+)-$ glyceraldehyde.

90. Bakelite is a step-growth polymer i.e., the condensation involving the reaction of functional group e.g., terylene, Bakelite etc.