SRIGAYATRI EDUCATIONAL INSTITUTIONS

INDIA

Sec:SR MPC	GT-3	Date: 12-09-20
Time: 02:00 PM to 05:00 PM	New Model-1_P2	Max Marks: 264

KEY & SOLUTIONS

MATHS

1	**AD**	2	**ABCD**	3	**ACD**	4	**ACD**	5	**ACD**
6	**ABC**	7	**BC**	8	**AB**	9	**D**	10	**ABD**
11	**AB**	12	**BC**	13	**2**	14	**7**	15	**5**
16	**1**	17	**2**	18	**1**	19	**4**	20	**6**
21	**0**	22	**2**						

PHYSICS

23	**BD**	24	**ABC**	25	**BD**	26	**C**	27	**AC**
28	**ACD**	29	**D**	30	**A**	31	**D**	32	**D**
33	**B**	34	**A**	35	**8**	36	**9**	37	**1**
38	**8**	39	**4**	40	**2**	41	**2**	42	**3**
43	**8**	44	**1**						

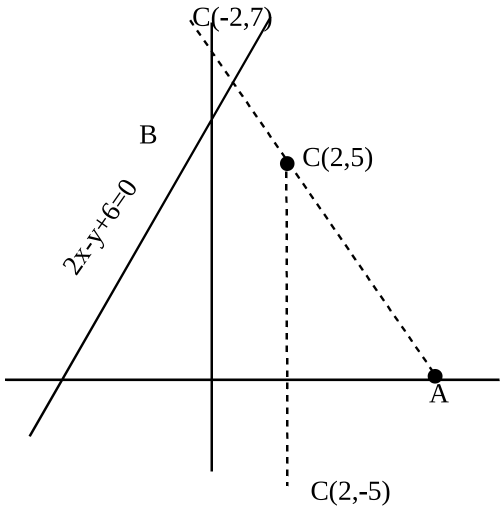
CHEMISTRY

45	**ABC**	46	**BC**	47	**ABC**	48	**BCD**	49	**A**
50	**ACD**	51	**ABD**	52	**ABC**	53	**C**	54	**C**
55	**C**	56	**B**	57	**4**	58	**8**	59	**1**
60	**5**	61	**0**	62	**2**	63	**4**	64	**5**
65	**4**	66	**5**						

SOLUTIONS
MATHEMATICS

1. $C' = (2,-5)$

$C'' = (-2,7)$



Perimeter AB+BC+CA

=AB+BC''+AC'

$\geq C'C''$

$\geq \sqrt{16+144} = 4\sqrt{10}$

$C'C''$ equation : 3x+y-1=0

Solving with $C'C''$

$\rightarrow A = \left(\frac{1}{3},0\right)$: B=(-1,4)

Area $= \frac{1}{2}\begin{vmatrix} 3 & 3/5 \\ 1 & 5 \end{vmatrix} = \frac{1}{2}\left(15 - \frac{5}{3}\right) = \frac{20}{3}$ sq. units

2. Minimum $6 - r\left(\frac{3}{\sqrt{10}}\right) = r$

$\Rightarrow r = 60 - 18\sqrt{10}$

Maximum $6 + r\left(\frac{3}{\sqrt{10}}\right) = r$

$\Rightarrow r = 60 + 18\sqrt{10}$

Tgt: $x - 3y + 9 = 0$

Normal $3x + y - 33 = 0$

$\Rightarrow \frac{x}{11} + \frac{y}{33} = 1$

Area $= \frac{6^2}{2}\left|\frac{1}{3} + 3\right| = 18 \times \frac{10}{3} = 60$ sq. units

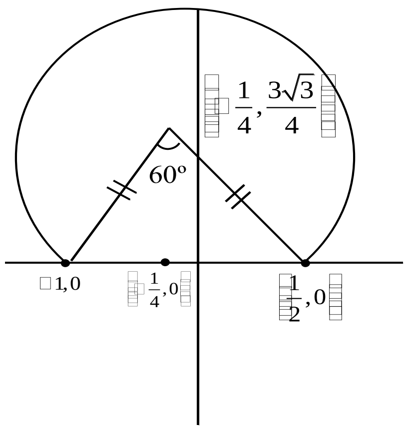
3. $\text{Arg}\left(\frac{Z(2Z-1)}{Z(Z+1)}\right)=\frac{\pi}{6} \Rightarrow \arg\left(\frac{Z-\frac{1}{2}}{Z+1}\right)=\frac{\pi}{6}$

Contre $=\left(-\frac{1}{4},\frac{3\sqrt{3}}{4}\right)$

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

$\therefore\ \text{Re}(Z)\max=-\frac{1}{4}+\frac{3}{2}=\frac{5}{4}$

$\ln(Z)\ \max=\frac{3\sqrt{3}}{4}+\frac{3}{2}=\frac{6+3\sqrt{3}}{4}$



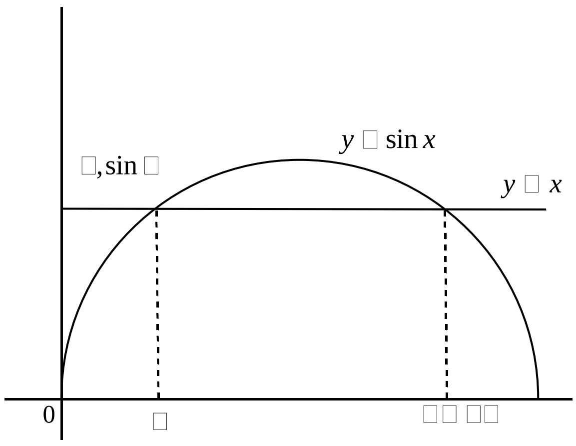
4. Solving 3 planes (1,2,1), substituting in 4th plane $\lambda = 2$

$\begin{matrix}1 & -2 & 1\\ 2 & -1 & 1\end{matrix}$ $\quad\quad$ $\begin{matrix}1 & 1 & 1\\ 1 & 2 & -1\end{matrix}$

$\vec{a}=(-1,1,3)$ $\quad\quad$ $\vec{b}=(-3,2,1)$ $\quad\quad$ $\theta=\cos^{-1}\left(\frac{8}{\sqrt{11}\sqrt{14}}\right)=\cos^{-1}\left(\sqrt{\frac{32}{77}}\right)$

Also $y=0, z=0 \Rightarrow x=4$ $\quad\quad$ $\therefore\ (4,0,0)$ lies on L_2 (needs x-axis)

5.



$\int_{\alpha}^{\pi-\alpha}(\sin x-K)dx=1$

$\Rightarrow\ (-\cos x-kx)_{\alpha}^{\pi-\alpha}=1$

$\Rightarrow -\{-\cos\alpha - \cos\alpha + K(\pi - \alpha) - k\alpha\} = 1$

$\Rightarrow 2\cos\alpha - k\pi + 2k\alpha = 1$

$\Rightarrow 2\cos\alpha - 2k\left(\frac{\pi}{2} - \alpha\right) = 1 \Rightarrow 2\sqrt{1-k^2} - 2k.\cos^{-1}k = 1$

$\Rightarrow \sqrt{1-k^2} - k\cos^{-1}k = \frac{1}{2} \Rightarrow P = \frac{1}{2}$

6. $3 = \frac{1}{2} \times \sqrt{2} \times \sqrt{3} \times h \Rightarrow h = \sqrt{6}$

$\overrightarrow{A_1A}.\overrightarrow{AB} = 0, \overrightarrow{A_1A}.\overrightarrow{BC} = 0, \overrightarrow{A_1A}.\overrightarrow{CA} = 0$

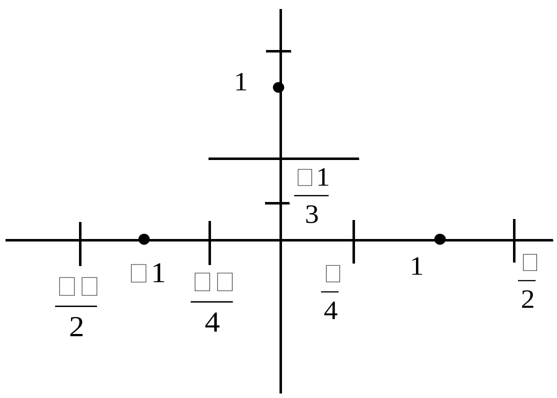
$\therefore AA_1 = \sqrt{6}$

$\therefore A_1 = (0,-2,0)(or)(2,2,2)$

$\therefore (a,b,c) = (0,-2,0)$ (or) $(a,b,c) = (2,2,2)$

7,8 & 9.

$$f(x) = \begin{cases} \frac{1}{3}, & x = -\frac{\pi}{4} \\ \frac{1}{2}, & \frac{-\pi}{4} < x < \frac{\pi}{4} \\ \frac{1}{3}, & x = \frac{\pi}{4} \\ 0, & \frac{\pi}{4} < x < 1 \\ 0, & x = 1 \\ 1, & 1 < x < \frac{\pi}{2} \end{cases}$$ (f(x) is even function)



10. R.W $= K = 4 \times 5 \times 6 \times 7 \times 8 \times 9 = 2^6.3^3.5^1.7^1$

11. $1200 = 2^4.3^1.5^2$

$K = (4+3-1)_{C_{3-1}}(1+3-1)_{C_{3-1}}.(2+3-1)_{C_{3-1}} = 15 \times 3 \times 6 = 270$

12. $l = 20 \times 9_{C_2} = 720 = 2^4.3^2.5^1$

13. GE$= \int_{-1}^{1} \frac{\sqrt{x^4+3x^2+1} - (x^2+x+1)}{(x^4+3x^2+1) - (x^4+2x^3+3x^2+2x+1)}dx = \int_{-1}^{1} \frac{\sqrt{x^4 3x^2+1} - (x^2+x+1)}{= (2x^3+2x)}$

$\Delta = \int_{-1}^{1} \frac{x}{2x^3 + 2x}dx = 2r\frac{1}{2}\int_{0}^{1} \frac{1}{x^2+1}dx = \frac{\pi}{4} \Rightarrow GE = 2$

14. $\Delta \frac{\alpha\beta\gamma}{(1-\alpha)(1-\beta)(1-\gamma)} \begin{vmatrix} 1 & 1 & 1 \\ 1-\alpha & 1-\beta & 1-\gamma \\ \alpha(1-\alpha) & \beta(1-\beta) & \gamma(1-\gamma) \end{vmatrix} = \frac{\alpha\beta\gamma}{(1-\alpha)(1-\beta)(1-\gamma)}.(\alpha-\beta)(\beta-\gamma)(\gamma-\alpha)$

$= \frac{-d/a}{\frac{a+b+c+d}{a}} \times \frac{15}{2}$

$\Rightarrow GE = 7$

15. $\bar{r}.\bar{a} + \bar{r}.\bar{b} + \bar{r}.\bar{c} = 0 \Rightarrow \sin x + \cos y + 2 = 0 \Rightarrow \sin x = -1, \cos y = -1$

$\Rightarrow \pm\frac{\pi}{2}, y = \pi$

$\therefore (G.E)_{\min} = \frac{4}{\pi^2}\left(\frac{\pi^2}{4} + \pi^2\right) = 5$

16. Clearly $f(x) = 0 \Rightarrow g(0) < 0 \Rightarrow k(3k+1) < 0 \Rightarrow -\frac{1}{3} < k < 0$

$f(x) = 1 \Rightarrow g(1) < 0 \Rightarrow 2 - 3(k+1) + 3k^2 + k < 0$

$\Rightarrow (3k+1)(k-1) < 0 \Rightarrow -\frac{1}{3} < k < 1$

$\therefore \therefore$ *No.* of in tegers =1

17. $f(f(x)) = x \ \forall x \in [0,1] \Rightarrow l = 1, \quad m = 0$

GE=2

18. $f(x+5) \geq f(x) + 5 \ \& \ f(x+5) \leq f(x) + 5$

$\Rightarrow f(x+5) = f(x) + 5 \Rightarrow f(x) = x \Rightarrow GE = 1$

19. Conceptual

20. Maximum value $= 15° = \frac{\pi}{12} \Rightarrow K = \frac{1}{12} \Rightarrow G.E = 6$

21. $A.M \Rightarrow G.M \Rightarrow LHS > 3 \neq RHS$

Number of solutions =0

22. $S_n = \sum_{r=0}^{n} \frac{\sin\left(\frac{x}{2^r} - \frac{x}{2^{r+1}}\right)}{\cos\left(\frac{x}{2^{r+1}}\right)\cos\left(\frac{x}{2^r}\right)} = \tan x - \tan\left(\frac{x}{2^{n+1}}\right)$

$\therefore f(\ ) = \tan x \qquad \therefore G.L = 2$

PHYSICS

23. $W_X = \frac{RhcZ^2}{3^2} \ (Z = 3)$

$W_Y = \frac{RhcZ^2}{16} \quad (Z = 2)$

$E_x = W_x + K_1$

$E_y = W_Y + K_2 \quad \& K_1 = \frac{1}{2}K_2$

24. $\frac{C_0}{\mu_0\left(1+\frac{x}{a}\right)} = \frac{dx}{dt}$ Integrate $t = \frac{3\mu_0 a}{2C}$

25. Least count is not always 1M.S.D-1 V.S.D

26 Since net force on negative charge is always directed towards positive charge so all the variable (like energy, eccentricity etc) must be depending on the angular momentum. The negative charge revolve around positive charge and hence it must emit radiation which makes all variable non-conserved.

27. conceptual

28. Radius of circular path performed by charged particle is $R = \frac{mV}{Bq}$

Time period T = $\frac{2\pi m}{Bq}$

For particle to enter in region III

$R > \ell$

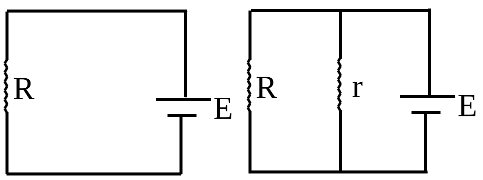
$\frac{mV}{Bq} > \ell \Rightarrow V > \frac{Bq\ell}{M}$

Path length of particle is region II is maximum when $R = \frac{mV}{Bq} = \ell$

So $V = \frac{Bq\ell}{M}$ for maximum path length in region II.

If the particle has to return to region I, time spent by particle in region II is $\frac{T}{2}$ i.e., $\frac{\pi M}{Bq}$

29. In steady state, the equivalent electric circuit is as shown



R = $\frac{E^2}{P} = \frac{(100)^2}{0.2} = 50\ k\Omega$

r = $\frac{E}{I} = \frac{100}{10 \times 10^{-3}} = 10\ k\Omega$

30. When capacitor gets fully charged and S_2 is suddenly opened. Then it is a case of discharging in $C - R$ circuit

Where $q = q_0 e^{-t/\tau}$

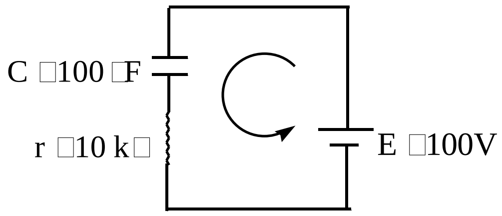
and $i = \left(-\frac{dq}{dt}\right) = \left(\frac{q_0}{\tau}\right) e^{-t/\tau}$

Here $q_0 = CE = (100C)$

$\tau = C(R_1 + R_2)$

On solving we get $C = 100\mu F$

31. Initially charge on capacitor $q_0 = 0.37\,CE$



$$E = \frac{q}{C} + ir = \frac{q}{C} + r\frac{dq}{dt}$$

$$\frac{dq}{E - \frac{q}{C}} = \frac{dt}{r} \Rightarrow \int_{q_0}^{q} \frac{dq}{E - \frac{q}{C}} = \frac{1}{r}\int_0^t dt$$

Solving this we get

$$q = CE - (CE - q_0)e^{\frac{-t}{Cr}}$$

Substituting the values we get

$$q = \left(10 - 5.66e^{-t}\right)mC$$

32, 33& 34.

Applying loop law in abcdefgha :

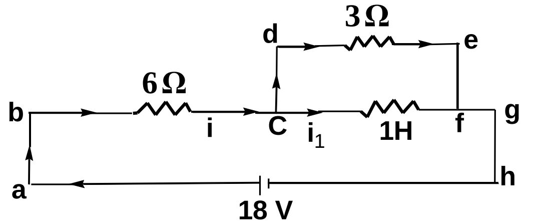
$18 = 6i + 3(i - i_1) \quad .....(i)$

In loop cdefc :

$3(i - i_1) = (1)\frac{di_1}{dt} \quad ...(ii)$

From Eq. (i)

$i = \frac{6 + i_1}{3} \quad ....(iii)$



Substituting in Eq. (iii), we have

$$3\left[\frac{6 + i_1}{3} - i_1\right] = \frac{di_1}{dt}$$

$$(6 - 2i_1) = \frac{di_1}{dt}$$

$$\int_0^{i_1} \frac{di_1}{6-2i_1} = \int_0^t dt$$

Solving this equation, we get $i_1 = 3\left(1-e^{-2t}\right)$

Substituting this value in Eq. (iii), we get $i = 2+\left(1-e^{-2t}\right)$

Potential difference across 3Ω resistance at time t is also equal to potential difference across inductor. Hence $V_{3\Omega} = V_L = L\left(\frac{di_1}{dt}\right) = 6e^{-2t}$

Further current across 3Ω and current across inductor are equal at $i - i_1 = i_1$ *or* $i = 2i_1$

Or $2+1-e^{-2t} = 6-6e^{-2t}$

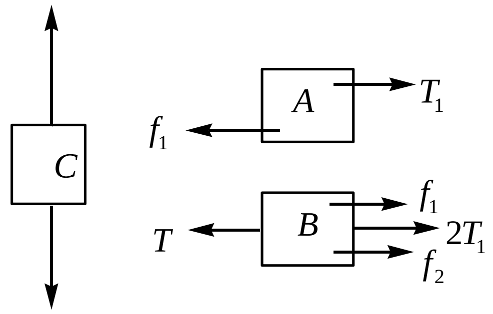
$\therefore 5e^{-2t} = 3 2t = \ln\left(\frac{5}{3}\right)$ *or* $t = \ln\sqrt{\frac{5}{3}}$

35. Applying momentum conservation

$200\times10 = 40(v+10)+100v$

$v = 8m/s$

36. Let f_1 and f_2 be the friction force between A and B and between B and horizontal surface respectively. Limiting values if these frictional forces will be



$f_{L_1} = 0.3\times50\times10 = 150N$

$f_{L_2} = 0.3\times120\times10 = 360N$

The FBD of the three blocks are shown in figure

Let m is the mass of block C. For A and B to remain at rest, block C should also remain at rest

For block $C: T = mg$

For block A: $T_1 = f_1$

For block $B: T = f_1 + f_2 + 2T_1$

For largest value of mass of C, the friction f_2 must be towards left

$T = 3f_1 + f_2 = mg$

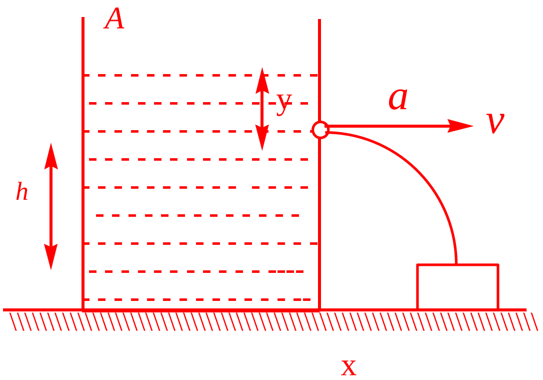
$f_1 \le f_{L1}$ *and* $f_2 \le f_{L2}$

Hence $mg \le 3f_{L1} + f_{L2}$ *or* $m \le 81$

$\therefore$ maximum value of $m = 81kg$

37. Velocity of efflux $v = \sqrt{2gy}$

Range $x = \sqrt{2gy} \times \sqrt{\frac{2h}{g}}$



The velocity of block must be $\frac{dx}{dt}$

$$v_b = \frac{dx}{dt} = \sqrt{\frac{2h}{g}} \times \sqrt{2g} \times \frac{1}{2\sqrt{y}} \frac{dy}{dt}$$

$$= \frac{\sqrt{h}}{\sqrt{y}} \frac{dy}{dt} \text{ ---------------(i)}$$

Using equation of continuity

$$A\frac{dy}{dt} = a\sqrt{2gy} \text{ --------------(ii)}$$

From equation (i) and (ii)

$$v_b = \sqrt{\frac{h}{y}} \times \frac{a}{A}\sqrt{2gy}$$

$$= \sqrt{2gh} \times \frac{a}{A} = 20 \times \frac{1}{20} = 1ms^{-1}$$

38. $m \times 0.5 \times 5 + 1 \times 80 = 100$ $m = \frac{20}{25} = 8$

39. Let the velocity of cars 1 and 2 be $v_1 m/s$ and $v_2 m/s$ respectively

$\therefore$ a parent frequencies of sound emitted by car 1 and 2 as detected at end point are

$$f_1 = f_0\left(\frac{v}{v - v_1}\right), f_2 = f_0\left(\frac{v}{v - v_2}\right)$$

$$330 = 300\left(\frac{300}{300 - v_1}\right) \text{and } 360 = 300\left(\frac{330}{330 - v_2}\right)$$

Solving above equation we get

$v_1 = 30m/s$ and $v_2 = 55m/s$

The distance between both the cars just when the 2nd car reaches end point B

$100m = v_2 t - v_1 t$ or $t = 4\sec$

40. The process is described by

$P = \frac{k}{V^2}$ Where k is a constant

Let volume at C be $V \Rightarrow 3P_0V_0^2 = P_0V^2 \Rightarrow V = \sqrt{3}V_0$

$$W = \int_{V_0}^{\sqrt{3}V_0} PdV = \int_{V_0}^{\sqrt{3}V_0} \frac{k}{V^2} = k\left[-\frac{1}{V}\right]_{V_0}^{\sqrt{3}V_0}\left[\frac{1}{V} - \frac{1}{\sqrt{3}V_0}\right] = \left(3-\sqrt{3}\right)P_0V_0$$

Change in internal energy $\Delta U = \frac{f}{2}nR\Delta T = \frac{3}{2}nR\Delta t$

$$\Delta T = T_C - T_A = \frac{\sqrt{3}P_0V_0}{nR} - \frac{3P_0V_0}{nR} = -\left(3-\sqrt{3}\right)\frac{P_0V_0}{nR}$$

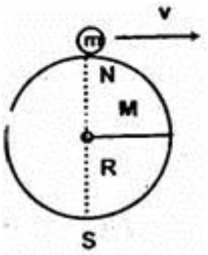
$$\Delta U = \frac{3}{2}\left(3-\sqrt{3}\right)P_0V_0$$

First law of thermodynamics, $\Delta Q = \Delta U + W$

$$\Rightarrow \Delta Q \frac{3}{2}\left(3-\sqrt{3}\right)P_0V_0 + \left(3-\sqrt{3}\right)P_0V_0 = \frac{1}{2}\left(3-\sqrt{3}\right)P_0V_0$$

and $\Rightarrow \Delta Q = nC\Delta T \Rightarrow nC\Delta T = -\frac{1}{2}\left(3-\sqrt{3}\right)P_0V_0 \ \Rightarrow n.c\frac{\left(3-\sqrt{3}\right)}{nR} = \frac{\left(3-\sqrt{3}\right)P_0V_0}{2} \Rightarrow c = R/2$

41. When the centre of the satellite is at a distance y from the centre of the earth,
By conservation of energy



$$\frac{1}{2}mv^2 - \frac{GMm}{R+r} = \frac{1}{2}mv_1^2 - \frac{GMm}{y}$$

Since $r << R$,

$$\frac{1}{2}mv^2 - \frac{GMm}{R} = \frac{1}{2}mv_1^2 - \frac{GMm}{y}$$

Also by conservation of angular momentum at the for that distance

$$mvR = mvy \ v_1 = \frac{vR}{y}$$

$$\therefore \frac{1}{2}mv^2 - \frac{GMm}{R} = \frac{1}{2}mv_1^2 - \frac{GMm}{y} = \frac{1}{2}\frac{mv^2R^2}{y^2} - \frac{GMm}{y}$$

$$\frac{1}{2}mv^2\left[1-\frac{R^2}{y^2}\right] = GMm\left(\frac{1}{R}-\frac{1}{y}\right)$$

$$\Rightarrow \frac{1}{2}mv^2\left[\frac{(y-R)(y+R)}{y^2}\right] = GMm\left[\frac{y-R}{Ry}\right] \Rightarrow v^2(y+R)R = 2GMy$$

$$v^2R^2 = y\left[2GM - v^2R\right] \Rightarrow y = \frac{v^2R^2}{2GM - v^2R}$$

If $Rv^2 = 2GM \ \ y = \infty$

$\therefore$ Satellite will escape to infinity.

42. Consider a small angular displacement β

Torque about the rotational axis

$$T = -\left(mg\frac{l}{2}\sin\theta\right)(\beta)$$

$$T \Rightarrow \alpha$$

$$1 = m\frac{(l\sin\theta)^2}{3} = m\frac{l^2\sin^2\theta}{3}$$

$$-\left(mg\frac{l}{2}\sin\theta\right)(\beta) = \frac{ml^2\sin^2\theta}{3}\alpha$$

$$\alpha = -\left(\frac{3g}{2l\sin\theta}\right)\beta$$

$$\therefore T = 2\pi\sqrt{\frac{2l\sin\theta}{3g}}$$

43. $t = \frac{t_1 t_2}{t_1 + t_2} = \frac{6 \times 3}{9} = 2\text{ hr}$

6 hr. is equal to three half lines

$$N = \frac{N_0}{2^3} = \frac{N_0}{8} \Rightarrow \frac{N_0}{N} = 8$$

44. $y = Ae^{-(5x^2 - 40x + 80)}$

$$= Ae^{-5(x-4)^2}$$

$$y = \; = Ae^{-b(kx - wt)^2}$$

$$k = 1, w = 2 \quad V = \frac{w}{k} = 2\text{ m/sec}$$

CHEMISTRY

$$(X) = CH_2 = CH - O - CH_2CH_3 \xrightarrow{H_3O^{\oplus}} CH_3CHO + CH_3CH_2OH$$

(y) (z)

45.

46. (B, C) If only the concentration of P is increased to nine times, than the rate of the reaction becomes thrice its original value. This means the order with respect to is 1/2. If only the concentration of Q is doubled, the rate becomes four times the original value. This means the order with respect to Q is 2. So, overall order is 5/2.

Units of rate constant

$= (\text{conc})^{1-n}s^{-1}$

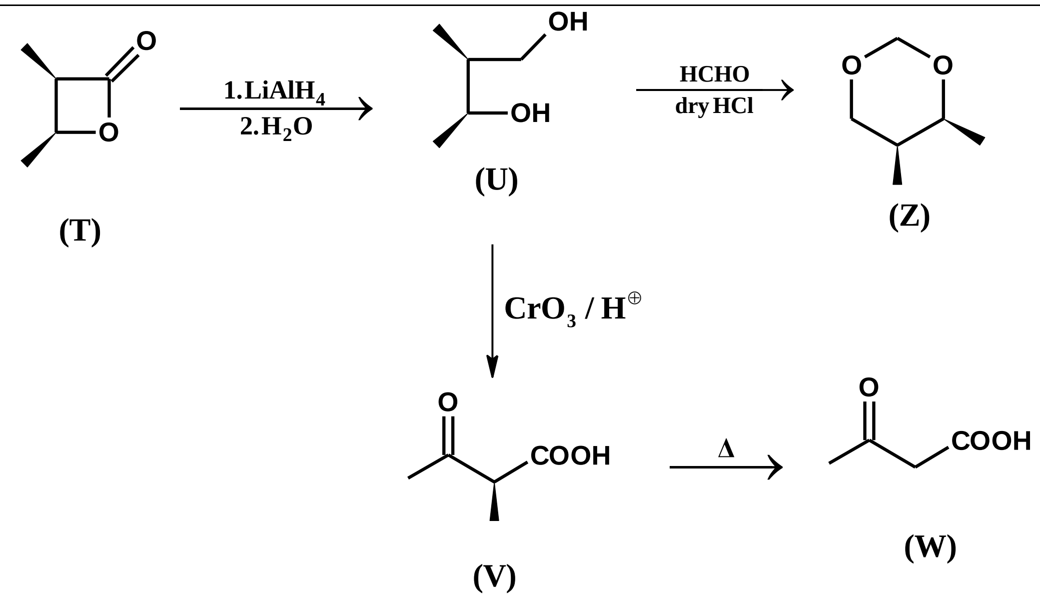
$= \left(\text{moles } L^{-1}\right)^{1-\frac{5}{2}} s^{-1}$

$= L^{\frac{3}{2}}\text{ mol}^{-\frac{3}{2}}\, S^{-1}$

Only for the 1st order reactions, half–life is independent of the initial concentration of reactants.

47. Pyrosilicate: $Si_2O_7^{6-}$

48.



49. From the graph it is clear that,

Threshold frequency is $\nu_o = 1\times10^{15}Hz$

$\therefore \lambda_o = \frac{c}{\nu_o} = \frac{3\times10^8}{1\times10^{15}} = 3000\mathring{A}$

And work function $(W) = h\nu_o$

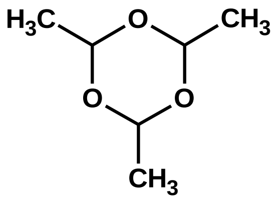
$= 6.62\times10^{-34}\times1\times10^{15} = 6.62\times10^{-19}J$

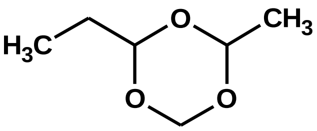
50. (b) Ea, order $\rightarrow$ S > Se > Te > O

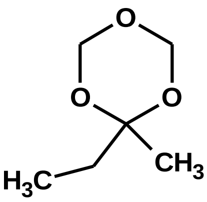
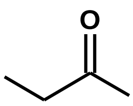
Due to very small size and higher electronic density oxygen has lesser EA, value than other elements in its group.

Acidic nature α magnitude of O.S.

(51-52)SOLUTON :

 $\xrightarrow{H_3O^{\oplus}}$ $3CH_3CHO$ **(P)**

 $\xrightarrow{H_3O^{\oplus}}$ HCHO **(R)** + CH_3CHO **(P)** + CH_3CH_2CHO **(Q)**

 $\xrightarrow{H_3O^{\oplus}}$ 2HCHO **(R)** +  **(S)**

53. Negative soles are precipitated by high positive charge on metals.

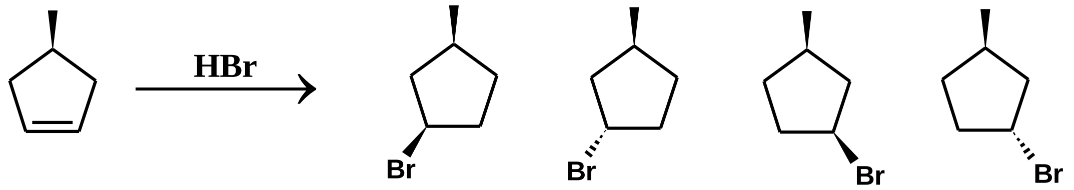
54. Coagulation depends on both magnitude and sign.

55. ΔG is more negative for PbS formation

ΔG is positive for formation of CS_2 at room temperature

56. Because PbS is below H_2S formation in the diagram

57.



58. Average velocity = $\sqrt{\frac{8RT}{\pi M}} = 4\times10^2 m/s \Rightarrow \frac{RT}{\pi M} = 2\times10^4$.

$\Rightarrow$ RT = 2π M x 10^4.

Total KE of He = $\frac{3}{2}nRT = \frac{3}{2}\times\frac{W}{M}\times RT = \frac{3}{2}\times\frac{6}{4}\times RT = \frac{9RT}{4}$

= $\frac{9}{4}\times 2\pi M\times10^4$ x 10^{-3}

= 180 π Joule.

Total KE of Ne^{20} = $\frac{12}{20}\times\frac{3}{2}RT = \frac{9}{10}RT = \frac{9}{10}\times2\pi M\times10^4\times10^{-3} = 360\pi$ Joule

Average KE per mole = $\frac{(360+180)\pi}{1.5+0.6} = 807.84J = 0.8KJ$ = x .

∴ x = 0.8 kJ ; 10 x = 0.8 x 10 = 8.

59. **(i) BN**

(ii) $B_3N_3H_3Cl_3$, $B_3N_3H_6$

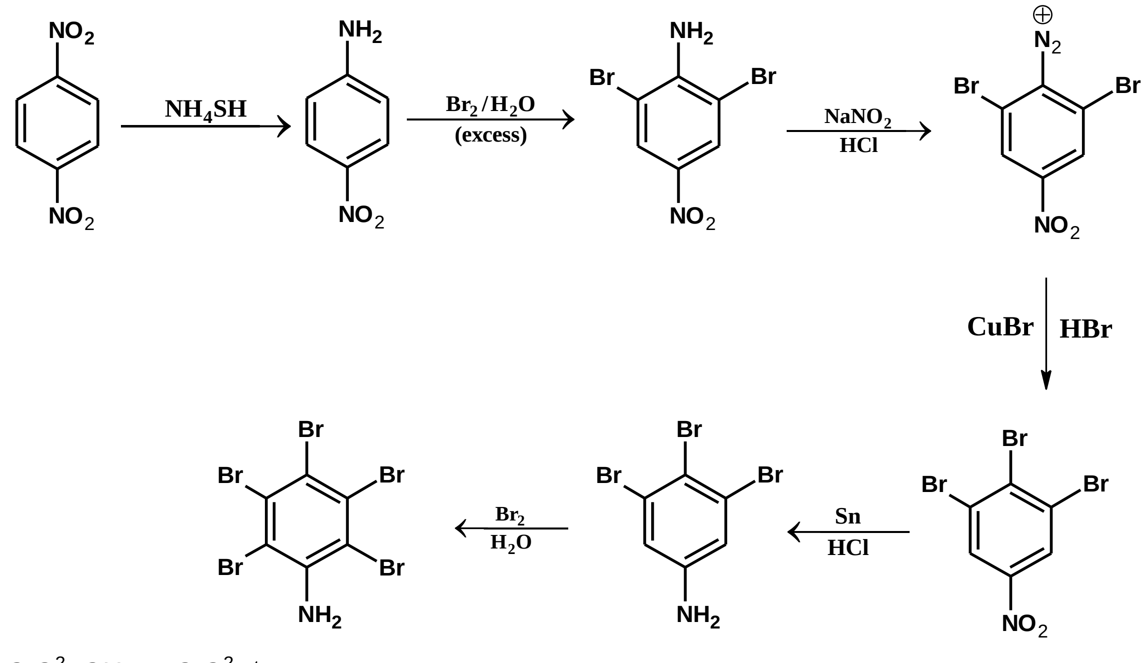
(iii) B + KF

(iv) $Cr(BO_2)_3$

(v) $[BH_2(CH_3NH_2)_2]^+[BH_4]^-$

(vi) $2BH_3.(CH_3)_3N$

60.



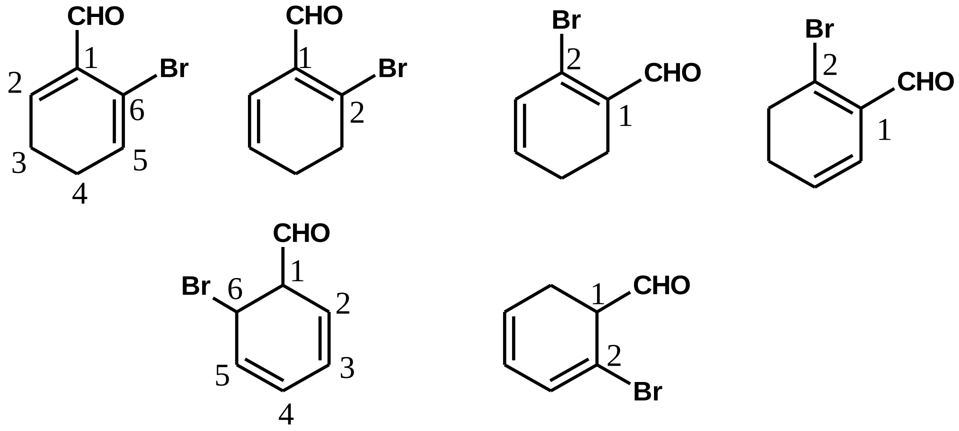
61. $\underset{\text{orange}}{CrO_7^{2-}}\ OH^- \rightarrow \underset{\text{yellow}}{CrO_4^{2-}}$ t

Oxidation number of Cr in $Cr_2O_7^{2-} = +6$

Oxidation number of Cr in $CrO_4^{2-} = +6$

62. I and II

63.



64. $H_2PO_4^- \rightleftharpoons HPO_4^{2-} + H^+$

pH = $\frac{1}{2}(pK_1 + pK_2)$

$pK_1 = -\log\left(4.1\times10^{-3}\right) = 3 - \log 4.1 = 2.39$

$pK_2 = -\log\left(4.2\times10^{-8}\right) = 8 - \log 4.2 = 7.38$

pH = $\frac{1}{2}(2.39 + 7.38) = 9.77 = 4.89$

65. a. $\text{Na-Hg} + H_2O \longrightarrow NaOH + Hg + \frac{1}{2}H_2$

c. $4NaOH + ZnCl_2 \longrightarrow Na_2ZnO_2 + 2NaCl + 2H_2O$

d. $CuSO_4 + H_2O + Na_2CO_3 \longrightarrow CuCO_3.Cu(OH)_2 + Na_2SO_4 + CO_2$

e. In case of alkali metals for performing flame test, chlorides are preferred over carbonates as they are more volatile

66. Molarity of H_2O_2 solution $= \frac{22.4}{11.2} = 2$

$H_2S + H_2O_2 \rightarrow 2H_2O + S$

i.e., number of moles of H_2O_2 required = number of moles of H_2S

$\Rightarrow 2\times V(in \quad mL)\times10^{-3} = \frac{0.34}{34}$

$\Rightarrow V(in \quad mL) = 5$