Sri Chaitanya IIT Academy.,India.

A.P T.S KARNATAKA TAMILNADU MAHARASTRA DELHI RANCHI

A right Choice for the Real Aspirant

ICON Central Office - Madhapur - Hyderabad

SEC: Sr.S60_Elite, Target & LIIT-BTs JEE-MAIN Date: 05-01-2025
Time: 09.00Am to 12.00Pm GTM-14/09 Max. Marks: 300

KEY SHEET

MATHEMATICS

1	**2**	2	**2**	3	**3**	4	**3**	5	**3**
6	**3**	7	**1**	8	**1**	9	**2**	10	**4**
11	**1**	12	**1**	13	**3**	14	**4**	15	**4**
16	**4**	17	**4**	18	**2**	19	**1**	20	**2**
21	**1**	22	**5**	23	**96**	24	**1**	25	**180**

PHYSICS

26	**4**	27	**1**	28	**3**	29	**4**	30	**4**
31	**2**	32	**2**	33	**4**	34	**3**	35	**3**
36	**2**	37	**2**	38	**4**	39	**1**	40	**2**
41	**1**	42	**4**	43	**4**	44	**4**	45	**1**
46	**6**	47	**20**	48	**18**	49	**200**	50	**144**

CHEMISTRY

51	**3**	52	**4**	53	**3**	54	**1**	55	**3**
56	**4**	57	**2**	58	**1**	59	**3**	60	**1**
61	**4**	62	**4**	63	**2**	64	**2**	65	**1**
66	**1**	67	**4**	68	**4**	69	**2**	70	**3**
71	**7**	72	**4**	73	**790**	74	**7**	75	**25**

SOLUTION
MATHEMATICS

1. $\lim_{x\to 0}\frac{e^{x^2}-\cos x}{\sin^2 x}=\lim_{x\to 0}\frac{2xe^{x^2}-\sin x}{2\sin x\cos x}$

(Using L' Hospital Rule), $\lim_{x\to 0}\left(\frac{x}{\sin x}e^{x^2}+\frac{1}{2}\right)\frac{1}{\cos x}=1+\frac{1}{2}=\frac{3}{2}$

2. Put $\sin x = t$

3. $\sum x_i = 15\times 12\, and\, \frac{\sum x_i^2}{15}-12^2=14$, And $\sum y_i = 15\times 14\, and\, \frac{\sum y_i^2}{15}-14^2=\sigma^2$

Now $13=\frac{(14+144)\times 15+(\sigma^2+196)\times 15}{30}-13^2 \qquad \Rightarrow 3\sigma^2=30$

4. Use a_n formula to find $a=4$ and $d=5$

5. Take the terms as $4/r^2,\ 4/r,\ 4,\ 4r,\ 4r^2$

6. $x^2 - 8x + 17 = (x-4)^2 + 1$ or differentiate or use formula for minimum of quadratic function.

7. Given, $2\omega+1=z \qquad 2\omega+1=\sqrt{-3}\left[\therefore z=\sqrt{-3}\right] \qquad \Rightarrow \omega=\frac{-1+\sqrt{3}i}{2}$

Since, ω is cube root of unity. $\qquad \therefore \omega^2=\frac{-1-\sqrt{3}i}{2}\, and\, \omega^{3n}=1$

Now, $\begin{vmatrix}1 & 1 & 1\\ 1 & -\omega^2-1 & \omega^2\\ 1 & \omega^2 & \omega^7\end{vmatrix}=3k \qquad \Rightarrow \begin{vmatrix}1 & 1 & 1\\ 1 & \omega & \omega^2\\ 1 & \omega^2 & \omega\end{vmatrix}=3k$

$\left[\therefore 1+\omega+\omega^2=0\, and\, \omega^7=\left(\omega^3\right)^2.\omega=\omega\right]$

On applying $R_1\to R_1+R_2+R_3$, we get $\begin{vmatrix}3 & 1+\omega+\omega^2 & 1+\omega+\omega^2\\ 1 & \omega & \omega^2\\ 1 & \omega^2 & \omega\end{vmatrix}=3k$

$\Rightarrow \begin{vmatrix}3 & 0 & 0\\ 1 & \omega & \omega^2\\ 1 & \omega^2 & \omega\end{vmatrix}=3k \qquad \Rightarrow 3\left(\omega^2-\omega^4\right)=3k \Rightarrow \left(\omega^2-\omega\right)=k$

$\therefore k=\left(\frac{-1-\sqrt{3}i}{2}\right)-\left(\frac{-1+\sqrt{3}i}{2}\right)=-\sqrt{3}i=-z$

8. Let A is $(1-3\mu,\mu-1,2+5\mu)$

$\overline{AB}=(3\mu+2)\hat{i}+(3-\mu)\hat{j}+(4-5\mu)\hat{k}$ which is parallel to plane $x-4y+3z=1$

$=-8\mu+2=0\Rightarrow \mu=\frac{1}{4}\ \therefore 4\mu=1$

9. $x+y+z=5, \qquad x+2y+3z=9, \qquad x+3y+\alpha z=\beta$

$D=\begin{vmatrix}1 & 1 & 1\\ 1 & 2 & 3\\ 1 & 3 & \alpha\end{vmatrix}=0\Rightarrow(2\alpha-9)+(3-\alpha)+(3-2)=0 \qquad \Rightarrow \alpha=5$

Now, $D_3 = \begin{vmatrix} 1 & 1 & 5 \\ 1 & 2 & 9 \\ 1 & 3 & \beta \end{vmatrix} = 0 \Rightarrow 2\beta - 27 + 9 - \beta + 5(3-2) = 0 \Rightarrow \beta = 13 \Rightarrow at\ \alpha = 5, \beta = 13$

10. $\frac{x-2}{3} = \frac{y+1}{4} = \frac{z-2}{12} = \lambda[say]......(i)$

And equation of plane is $x - y + z = 16$

Any point on the line (i) is $(3\lambda+2, 4\lambda-1, 12\lambda+2)$

Let this point of intersection of the line and plane .

$(3\lambda+2)-(4\lambda-1)+(12\lambda+2)=16 \quad \therefore 11\lambda = 11 \Rightarrow \lambda = 1$ So, the point of intersection is $(5,3,14)$

Now , distance between the points $(1,0,2)$ and $(5,3,14) = \sqrt{(5-1)^2+(3-0)^2+(14-2)^2}$

$= \sqrt{16+9+144} = \sqrt{169} = 13$. $\therefore$ Twice the distance =26

11. Substituting the points in the given line gives negative values for both points

12. $\therefore x_1 + x_2 + x_3 + x_4 + x_5 = 3 \rightarrow$ (remaining) $\therefore {}^{3+5-1}C_{5-1} = {}^7C_4 = {}^7C_3 \therefore$ total arrangement $= {}^7C_3 \times 4! = 840$

13. The planes are parallel, the normal of one plane is perpendicular to any vector of the other plane $\vec{p} \times \vec{q}$ and $\vec{r}$ are parallel.

14. Reqd . prob. $= \frac{7_{c_2}}{12_{c_2}} + \frac{5_{c_2}}{12_{c2}} \qquad = \frac{21+10}{66} = \frac{31}{66}$

15. A) $f'(x) = (1-x)(2x+1)e^{x(1-x)} \geq 0$ range is $[0,1]$

B) $f(x) = \begin{cases} 1-2x & x < -2 \\ 5 & -2 \leq x < 3 \\ 2x-1 & x \geq 3 \end{cases}$ Min. value of f(x) =5

Max. value of f(x)=2(4)-1=7

C) $f(x) = (x^2+1)^2 + 4$ Minimum at x = 0

D) $f'(x) = 2x^3(2-x^2)e^{-x^2} \Rightarrow$ Decreasing in [-1,0]

16. $f(x) = 8ax - a\sin 6x - 7x - \sin 5x$

$f'(x) = 8a - 6a\cos 6x - 7 - 5\cos 5x = 8a - 7 - 6a\cos 6x - 5\cos 5x$

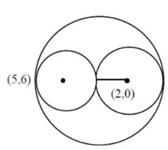
$f(x)$ is an increasing function

$f'(x) > 0 \therefore 8a - 7 > 6a + 5$ (no critical points) $\Rightarrow 2a > 12 \quad a > 6 \quad a \in (6, \infty)$

17. $5x^2(1 + {}^{11}C_1 x^2 + ...)$

18. $(x-2)^2 + y^2 = 4$ Centre is $(2,0)$ and radius =2

Distance between $(2,0)$ and $(5,6)$ is $\sqrt{9+36} = 3\sqrt{5}$



$\therefore r_1 r_2 = \frac{(3\sqrt{5}-2)}{2}\frac{(3\sqrt{5}+2)}{2} = \frac{41}{4} \therefore 4r_1r_2 = 41$

19. $f'(x) = 3\sin^2 x.\cos x + \dfrac{2x}{1+x^2}$

20. $\dfrac{dy}{dx} + \dfrac{x}{x^2-1}y = \dfrac{x^4+2x}{\sqrt{1-x^2}}$

The I. F. of this differential equation is $e^{\int \frac{x}{x^2-1}dx} = e^{-\int \frac{x}{1-x^2}dx} = e^{\frac{1}{2}\log(1-x^2)} = \sqrt{1-x^2}$

The solution is given by $y\sqrt{1-x^2} = \int \dfrac{x(x^3+2)}{\sqrt{1-x^2}}\sqrt{1-x^2}\,dx + \lambda\int (x^4+2x)dx + \lambda = \dfrac{x^5}{5} + x^2 + \lambda$

At $y(0) = 0 \Rightarrow \lambda = 0 \Rightarrow y\sqrt{1-x^2} = \dfrac{x^5}{5} + x^2$ $\displaystyle\int_{-\sqrt{3}/2}^{\sqrt{3}/2} \frac{\frac{x^5}{5}+x^2}{\sqrt{1-x^2}}dx = \int_{-\sqrt{3}/2}^{\sqrt{3}/2} \frac{x^2}{\sqrt{1-x^2}}dx$

(The other part is odd) $= 2\displaystyle\int_0^{\sqrt{3}/2} \frac{x^2}{\sqrt{1-x^2}}dx$

Let $x = \sin\theta$, we get $I = 2\displaystyle\int_0^{\pi/3} \frac{\sin^2\theta}{\cos\theta}\cos\theta\, d\theta = 2\int_0^{\pi/3} \sin^2\theta\, d\theta = \int_0^{\pi/3} (1-\cos 2\theta)\, d\theta$

$= \theta - \dfrac{\sin 2\theta}{2}\Big|_0^{\pi/3} = \dfrac{\pi}{3} - \dfrac{\sqrt{3}}{4} \therefore 2I = \dfrac{2\pi}{3} - \dfrac{\sqrt{3}}{2}$

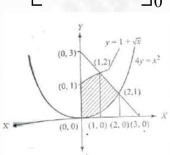
21. Point $S\left(\frac{1}{2},\frac{1}{2},\frac{1}{2}\right)$, Point $T(1,1,1)$

$\vec{p} = \overrightarrow{SP} = \dfrac{\hat{i}-\hat{j}-\hat{k}}{2}, \vec{q} = \overrightarrow{SQ} = \dfrac{-\hat{i}+\hat{j}-\hat{k}}{2}, \vec{r} = \overrightarrow{SR} = \dfrac{-\hat{i}-\hat{j}+\hat{k}}{2}, \vec{t} = \overrightarrow{ST} = \dfrac{\hat{i}+\hat{j}+\hat{k}}{2}$

Now $\vec{p}\times\vec{q} = \dfrac{\hat{i}+\hat{j}}{2}$ $\vec{r}\times\vec{t} = \dfrac{-\hat{i}+\hat{j}}{2}$, Now $(\vec{p}\times\vec{q})(\vec{r}\times\vec{t}) = \dfrac{\hat{k}}{2}$

22. Let $I = \displaystyle\int_0^1 (1+\sqrt{x})dx + \int_1^2 (3-x)dx - \int_0^2 \frac{x^2}{4}dx$

$= \left[x + \dfrac{x^{3/2}}{3/2}\right]_0^1 + \left[3x - \dfrac{x^2}{2}\right]_1^2 - \left[\dfrac{x^3}{12}\right]_0^2 = \left(1+\dfrac{2}{3}\right) + \left(6-2-3+\dfrac{1}{2}\right) - \left(\dfrac{8}{12}\right)$



$= \dfrac{5}{3} + \dfrac{3}{2} - \dfrac{2}{3} = 1 + \dfrac{3}{2} = \dfrac{5}{2}$ sq.unit $\therefore 2I = 5$

23. $(1+x^2)^4$: the middle terms is the third term $= {}^4C_2 x^4 = 96$ when $x = 2$

24. Vertex is (2,0), a = 1 Directrix is x = 1

25. $\dfrac{6!}{2!2!}$

PHYSICS

26. $\sin\left(\frac{\alpha x}{kt}\right)$=Dimensionless

$\therefore \frac{\alpha[L]}{[ML^2T^{-2}]}=[M^0L^0T^0] \Rightarrow \alpha=[ML^1T^{-2}]$

$\frac{\alpha}{\beta}=\frac{Energy}{Volume}=\frac{[ML^2T^{-2}]}{[L^3]} \Rightarrow \beta=\frac{[ML^1T^{-2}][L^3]}{ML^2T^{-2}}$

$=[M^0L^2T^0]$

27. We know that if range is same for two angle of projection, then these angle must be complementary.

Let first angle of projection be 'θ' then second will be $(90-\theta)$

$\therefore h_1=\frac{u^2\sin^2\theta}{2g}$ and $h=\frac{u^2\sin^2(90-\theta)}{2g}=\frac{u^2\cos^2\theta}{2g}$

$\therefore h_1h_2=\frac{u^2\sin^2\theta}{2g}.\frac{u^2\cos^2\theta}{2g}$. So, reason is correct

$\Rightarrow \sqrt{h_1h_2}=\frac{u^2\sin\theta\cos\theta}{2g} \Rightarrow 4\sqrt{h_1h_2}=\frac{4u^2\sin\theta\cos\theta}{2g}$

$\Rightarrow 4\sqrt{h_1h_2}=\frac{u^2(\sin\theta\cos\theta)}{g} \Rightarrow 4\sqrt{h_1h_2}=\frac{u^2\sin2\theta}{g}=R$

So, assertion is correct and reason is correct explanation of assertion.

28. $mv=(m+M)V'$

Or $v=\frac{mv}{m+M}=\frac{mv}{m+4m}=\frac{v}{5}$

Using conservation of ME, we have

$\frac{1}{2}mv^2=\frac{1}{2}(m+4m)\left(\frac{v}{5}\right)^2+mgh$ or $h=\frac{2}{5}\frac{v^2}{g}$

29. About the diameter of the circular loop (ring)

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

Using parallel axis theorem

Moment of inertia of the loop about XX' axis

$I_{xx'}=\frac{MR^2}{2}+MR^2=\frac{3}{2}MR^2$

Here mass $M=L\rho$ and radius $R=\frac{L}{2\pi}$;

$\therefore I_{XX'}=\frac{3}{2}(L\rho)\left(\frac{L}{2\pi}\right)^2=\frac{3L^3\rho}{8\pi^2}$

30. Due to complete solid sphere, potential point P

$V_{sphere}=\frac{-GM}{2R^3}\left[3R^2-\left(\frac{R}{2}\right)^2\right]$

$=\frac{-GM}{2R^3}\left(\frac{11R^2}{4}\right)=-11\frac{GM}{8R}$

Due to cavity part potential at point P

$V_{capacity}=-\frac{3}{2}\frac{\frac{M}{8}}{\frac{R}{2}}=-\frac{3GM}{8R}$

So potential at the centre of cavity

$=V_{sphere}-V_{capacity}=-\frac{11GM}{8R}-\left(-\frac{3}{8}\frac{GM}{R}\right)=\frac{-GM}{R}$

31. $T=\frac{(T_1+T_2+T_3)}{3}=60$

32. work done=Area of graph

$W=\frac{1}{2}(400-100)(4-2)$

$W=300J$

33. Time taken by the harmonic oscillator to move from mean position to half of the amplitude is $\frac{T}{12}$

$so, \frac{T}{12}=3$

$T=36\sec$

34. $f=\frac{n}{2l}\sqrt{\frac{T}{\mu}}$, where n = nth harmonic and is equal to number of antinodes.

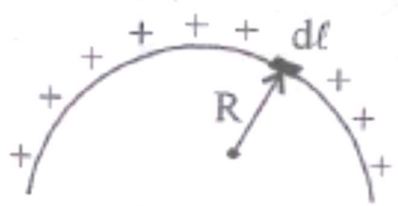
$f_A=\frac{p}{2l}\sqrt{\frac{T}{\rho A_0}}\Rightarrow f_B=\frac{q}{2l}\sqrt{\frac{T}{4\rho A_0}}\qquad \therefore \frac{f_A}{f_B}=\frac{2p}{q}\Rightarrow\frac{p}{q}=\frac{1}{2}$

35. When electric field is parallel to surface, it makes 90^0 angle with area vector so flux = 0

As $\phi=\bar{E}.\bar{A}=E\,A\cos 90^0=0$

36. $dv=\frac{1}{4\pi\in_0}\frac{\lambda d\ell}{R};v\int dv=\frac{1}{4\pi\in_0}\frac{\lambda\ell}{R}$

Potential at centre, $V=V_2+V_1 \quad\Rightarrow V=\frac{(\lambda.\pi R_2)}{4\pi\varepsilon_0 R_2}+\frac{(\lambda.\pi R_1)}{4\pi\varepsilon_0 R_1}=\frac{\lambda}{2\varepsilon_0}$



37. Resistance between P and Q $\quad r_{PQ}=r||\left(\frac{r}{3}+\frac{r}{2}\right)=\frac{r\times\frac{5}{6}r}{r+\frac{5}{6}r}=\frac{5}{11}r$

Resistance between Q and R $r_{QR}=\frac{r}{2}\|\left(r+\frac{r}{3}\right)=\frac{\frac{r}{2}\times\frac{4}{3}r}{\frac{r}{2}\times\frac{4}{3}}=\frac{4}{11}r$

Resistance between P and R $r_{PR}=\frac{r}{3}\|\left(\frac{r}{2}+r\right)=\frac{\frac{r}{3}\times\frac{3}{2}r}{\frac{r}{3}\times\frac{3}{2}r}=\frac{3}{11}r$

Hence, it is clear that r_{PQ} is maximum.

38. $F=\frac{mV^2}{r}$ and $F=qVB\ \therefore \frac{mV^2}{r}=qVB\Rightarrow r=\frac{mV}{qB}$

$or, r=\frac{\sqrt{2mK}}{qB}\qquad \left(\because p=mV=\sqrt{2mK}\right)\quad \Rightarrow \frac{r^2q^2B^2}{2m}=K$

$k_p=\frac{r_p^2q_p^2B^2}{2m_p}$ and $k_\alpha=\frac{r_\alpha^2q_\alpha^2B^2}{2m_\alpha}\quad \therefore \frac{K_p}{K_\alpha}=\frac{r_p^2q_p^2m_\alpha}{r_\alpha^2q_\alpha^2m_p}=\left(\frac{2}{1}\right)^2\left(\frac{1}{2}\right)^2\left(\frac{4}{1}\right)$ or, $\frac{K_p}{K_\alpha}=4:1$

39. According to Curie's law, magnetic susceptibility is inversely proportional to temperature for a fixed value of external magnetic field i.e. $X=\frac{C}{T}$

The same is applicable for ferromagnet & the relation is given as

$X=\frac{C}{T-T_C}\left(T_C \text{ is curie's Temperature}\right)$

Dimagnetism is due to non-cooperative behaviour of orbiting electrons when exposed to external magnetic field.

40. For LC oscillation, Maximum current, $I=Q_0.\omega=\frac{CV}{\sqrt{LC}}=V\sqrt{\frac{C}{L}}$

$\left[\because \omega=\frac{1}{\sqrt{LC}}\ \&\ Q_0-CV\right]=12\sqrt{\frac{100\times10^{-6}}{6.4\times10^{-3}}}=1.5A$

41.

$$\frac{E}{B}=C$$

$$\frac{E}{B}=3\times10^8$$

$$B=\frac{E}{3\times10^8}=\frac{9.6}{3\times10^8}$$

$$B=3.2\times10^{-8}T$$

$$\hat{B}=\hat{v}\times\hat{E}$$

$$=\hat{i}\times\hat{j}=\hat{k}$$

$$so,\ \vec{B}=3.2\times10^{-8}\hat{k}T$$

42. If side of object square = ℓ
and side of image square ℓ'

From question, $\frac{\ell'^2}{\ell^2}=9\,or\,\frac{\ell'}{\ell}=3$

i.e., magnification m =3,

u = -40 cm

$v=3\times40=120\,cm$

f = ?

From formula, $\frac{1}{v}-\frac{1}{u}=\frac{1}{r}\Rightarrow\frac{1}{120}-\frac{1}{-40}=\frac{1}{f}$

Or, $\frac{1}{f}=\frac{1}{120}+\frac{1}{40}=\frac{1+3}{120}\therefore f=30\,cm$

43. From the Einstein's photoelectric equation

$eV_0=\frac{hc}{\lambda}-\phi_0=\frac{hc}{\lambda}-\frac{hc}{\lambda_0}\qquad...(i)$

$\&\frac{eV_0}{4}=\frac{hc}{2\lambda}-\frac{hc}{\lambda_0}\qquad...(ii)$

$\Rightarrow\frac{1}{4}\left(\frac{hc}{\lambda}-\frac{hc}{\lambda_0}\right)=\frac{hc}{2\lambda}-\frac{hc}{\lambda_0}$

$\Rightarrow\frac{1}{\lambda_0}-\frac{1}{4\lambda_0}=\frac{1}{2\lambda}-\frac{1}{4\lambda}\Rightarrow\frac{3}{4\lambda_0}=\frac{1}{4\lambda}$

$\Rightarrow\lambda_0=3\lambda$

44. Nuclear fission between neutron $\left({}_{0}^{1}n\right)$ and uranium isotope ${}_{92}^{235}U$

${}_{92}^{235}U+{}_{0}^{1}n\rightarrow{}_{56}^{144}Ba+{}_{36}^{89}Kr+3{}_{0}^{1}n$

45. P.D. across 800Ω resistors = 5.6 V

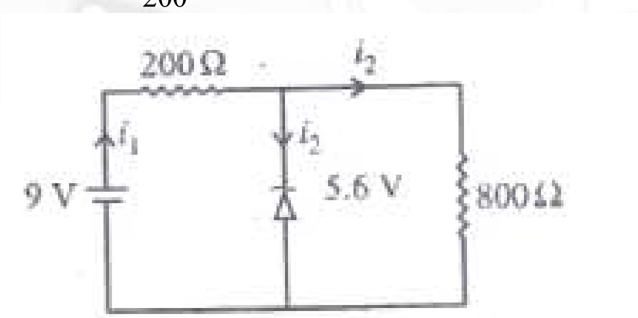
So, $I_{800\Omega}=\frac{5.6}{800}A=7\,mA$

Now, P.D. across

200Ω resistors

$=9-5.6\,V=3.4V$

So, $I_{200\Omega}=\frac{9-5.6}{200}=17\,mA$

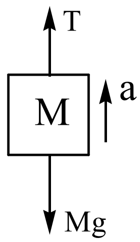


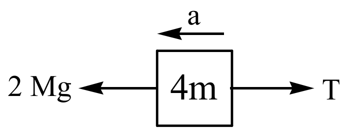
So, current through zener diode $=I_2=17-7=10\,mA$

46. For 4m

$2Mg-T=4Ma\qquad...(i)$

For M





T-mg=Ma

Adding (i) & (ii), we get ….(ii)

$\text{Mg}=5\,\text{Ma} \Rightarrow \text{a}=\dfrac{g}{5}$

So, $\text{T}=\text{Ma}+\text{Mg}=\dfrac{\text{Mg}}{5}+\text{Mg}=\dfrac{6}{5}\text{Mg}$

47. Given, Height of cylinder, h=20 cm Acceleration due to gravity, $g=10ms^{-2}$

Velocity of efflux $v=\sqrt{2gh}$

Where h is the height of the free surface of liquid from the hole

$\Rightarrow v=\sqrt{2\times 10\times 20}=20m/s$

48. Magnetic field $\text{F}=\text{i}\ell\text{B}$ $(\because \varepsilon = iR)$

$=\left(\dfrac{\varepsilon}{R}\right)\ell B=\left(\dfrac{vB}{R}\right)\ell B=\dfrac{vB^2\ell^2}{R}=\dfrac{4}{5}\times\left(\dfrac{15}{100}\right)^2\times 1^2$

$=\dfrac{4}{5}\times\dfrac{225}{10^4}=18\times 10^{-3}N$ $(\because \varepsilon = vB\ell)$

49. Intensity at a point is given by

$I=I_0\cos^2\left(\dfrac{\Delta\phi}{2}\right)$

$\Rightarrow$ According to question $\dfrac{I_0}{4}=\cos^2\left(\dfrac{\Delta\phi}{2}\right)$

$\Delta\phi=\dfrac{2\pi}{3}\therefore \Delta\phi=\dfrac{2\pi}{\lambda}\left(\dfrac{yd}{D}\right)=\dfrac{2\pi}{3}$

$\Rightarrow y=\dfrac{\lambda D}{3d}=\dfrac{600\times 10^{-9}\times 1}{3\times 10^{-3}}=2\times 10^{-4}m$

50. Longest wavelength corresponds to transition between n = 3 and n = 4

$\dfrac{1}{\lambda}=\text{RZ}^2\left(\dfrac{1}{3^2}-\dfrac{1}{4^2}\right)=\text{RZ}^2\left(\dfrac{1}{9}-\dfrac{1}{16}\right)=\dfrac{7\text{RZ}^2}{9\times 16}$

$\Rightarrow \lambda=\dfrac{144}{7\text{R}}=\dfrac{\alpha}{7\text{R}}(\text{given})\text{ for Z=1}\quad \therefore \alpha=144$

CHEMISTRY

51. The first electron gain enthalpy is exothermic (or negative). Generally, electron gain enthalpy becomes less exothermic (or less negative) when comparing elements of a group from top to bottom .
There fore, electron gain enthalpy of S> Se and Li>Na .
But there are some exceptions to this .
One of them is the case of a group 17 elements where electron gain is most negative for C1 instead of F, due to extra small size of fluorine
∴ Upon an electron gain, energy releases in the order :
Cl >F, S> Se and Li > Na .
52. Structure I is Trigonal Planar, Structure II, III & IV are pyramidal
53. MnO_2 is not reduced, rather oxidized to $KMnO_4$ during the preparation reaction
54. Conceptual
55. 3° Carbocation is more stable then 2° or 1° Carbocations
56. In Aryl halides Chlorine has resonating structures with benzene ring makes double bond character. Thus makes it a weak leaving group
57. Formaldehyde doesn't have alpha hydrogen.
58. A gives +ve Iodoform test with lower molecular mass.
59. Conceptual
60. Acetic Acid contains alpha hydrogen for halogenations
61. Sucrose is a non reducing sugar. Glucose and Fructose makes a acetal bond with glycosidic linkage.
62. Conceptual
63. $w=-nRT.2.303\log\frac{v2}{v_1}$
64. $K_2=\frac{1}{\sqrt{K_1}}$
65. $K_{sp}=s^2$
66. Conceptual
67. $P_s=P^0\times 2$
68. The correct order for Ionisation Energy is O > S > Se > Te > Po
69. I & II are exhibiting Cis and Trans geometrical Isomers
70. Conceptual
71. Except for O_3 , SCl_2 rest all are linear molecules.
72. I, V, Vi, VII are O,P Directing groups while others are meta directing
73. $\Delta H_{solution}$ =Lattice energy + Hydration energy
74. No.of equation acid= no.of equation base
75. $t_{\frac{1}{2}}=\frac{a_0}{2k}$