ANSWERS KEY

NEET-2018(Code-AA)

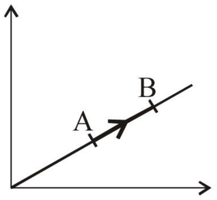
Date : 06.05.2018

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

NEET-2018 Solution, Code-AA

PHYSICS

1. (3)



$PV = nRT$

$V \alpha T \quad \Rightarrow P = \text{constant}$

$Q = \Delta U + W$

$$1 = \frac{\Delta U}{Q} + \frac{W}{Q}$$

$$\frac{W}{Q} = 1 - \frac{\Delta U}{Q}$$

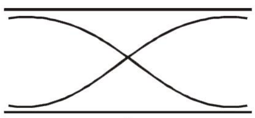
$$= 1 - \frac{nC_V \Delta T}{nC_P \Delta T}$$

$$= 1 - \frac{C_V}{C_P}$$

$$= 1 - \frac{1}{\gamma}$$

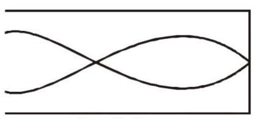
$$= 1 - \frac{1}{5/3} = 1 - \frac{3}{5} = \frac{2}{5}$$

2. (3)



l

$$\nu_1 = \frac{1}{2\ell}\sqrt{\frac{\gamma P}{\rho}}$$



l_1=20cm

$$\nu_3' = \frac{3}{4\ell_1}\sqrt{\frac{\gamma P}{\rho}}$$

Now $\nu_3' = \nu_1$

$$\frac{3}{4\ell_1}\sqrt{\frac{\gamma P}{\rho}} = \frac{1}{2\ell}\sqrt{\frac{\gamma P}{\rho}}$$

$$\Rightarrow \quad \ell = \frac{2\ell_1}{3} = \frac{2}{3} \times 20 = 13.3\text{cm}$$

3 (2)

$$V_{rms} = \sqrt{\frac{3RT}{M}} = \sqrt{\frac{3k_B T}{m}}$$

$$V_{rms} = V_{escape}$$

$$\sqrt{\frac{3k_B T}{m}} = 11.2 \times 10^3 \text{ m/s}$$

on squaring both side

$$\frac{3k_B T}{m} = 125.44 \times 10^6$$

$$T = \frac{m}{3k_B} \times 125.44 \times 10^6$$

$$= \frac{2.76 \times 10^{-26}}{3 \times 1.38 \times 10^{-23}} \times 125.44 \times 10^6$$

$$= \frac{346.2}{4.14} \times 10^3 = 83623\text{K} = 8.36 \times 10^4\text{K}$$

4. (3)

$$\%\eta = \left(1 - \frac{T_2}{T_1}\right) \times 100$$

$$= \left(1 - \frac{273}{373}\right) \times 100 = 26.8\%$$

5. (2)

$(47 \pm 4.7)\text{k}\Omega$

$$\Rightarrow \quad \%\text{ error } = \frac{4.7}{47} \times 100 = 10\%$$

$47\text{k}\Omega = 47 \times 10^3 \Omega$

Colour code is

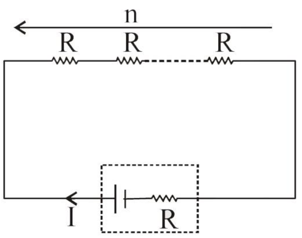
$4 \rightarrow$ yellow

$7 \rightarrow$ Violet

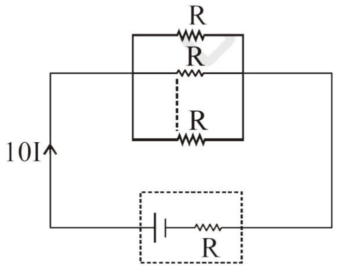
$3 \rightarrow$ Orange

$10\% \rightarrow$ Silver

6. (3)



$$I=\frac{\varepsilon}{(n+1)R} \quad ...(1)$$



$$10I=\frac{\varepsilon}{R+\frac{R}{n}} \quad ...(2)$$

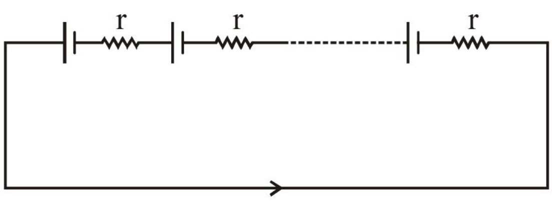
$$10I=\frac{n\varepsilon}{(n+1)R}$$

for (1) and (2)

$$\frac{10I}{I}=\frac{n\varepsilon}{\varepsilon}$$

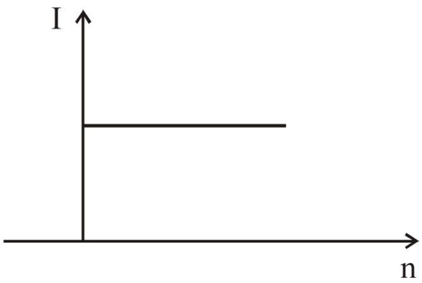
$n = 10$

7. (3)



$$I=\frac{n\varepsilon}{nr}=\frac{\varepsilon}{r}$$

$\Rightarrow$ 'I' is independent of 'n'



8. (2)

From Brewster's Law $\tan I_P = \mu$

$\Rightarrow I_P = \tan^{-1}(\mu)$

9. (2)

$d = 2\text{mm} = 2\times10^{-3}\text{m}$

$\lambda = 5896\text{Å} = 0.5896\times10^{-6}\text{m}$

$D = 100\text{cm} = 1\text{m}$

$\theta_1 = 0.20°$

$\theta_2 = 0.21°$

Angular width of funges

we know that

$$\beta=\frac{\lambda D}{d}$$

$$\theta=\frac{\beta}{D}=\frac{\lambda}{d}$$

$$\theta\alpha\frac{1}{d}\Rightarrow\frac{\theta_1}{\theta_2}=\frac{d_2}{d_1}$$

$$\Rightarrow d_2 = d_1\times\frac{\theta_1}{\theta_2} = 2\text{mm}\times\frac{0.20°}{0.21°} = 1.9\text{mm}$$

10. (1)

$$MP=\frac{f_0}{f_e}$$

11. (2)

$$\frac{KE}{TE}=\frac{1}{-1}$$

12. (3)

Velocity of electron at t = 0sec is V_0

$\Rightarrow$ de-Broglie wavelength $\lambda_0=\frac{h}{mV_0}$ ...(1)

Velocity of electron at 't' sec.

V = U + at

$$V = V_0+\frac{eE_0}{m}t \qquad \left[\begin{aligned} \because \quad & \vec{F} = -e\vec{E} \\ & = +eE_0\hat{i} \\ \Rightarrow \quad & \vec{a}=\frac{\vec{F}}{m}=\frac{eE_0}{m}\hat{i}\end{aligned}\right]$$

$\Rightarrow$ de-Broglie wavelength of electron at 't' sec

$$\lambda=\frac{h}{mV}=\frac{h}{m\left(V_0+\frac{eE_0}{m}t\right)}=\frac{\lambda_0}{1+\frac{eE_0}{mV_0}t}$$

13. (3)

$N_0 = 600$

No. of Nuclei Disintegrated = 450

No. of Nuclei left

$N = 600 - 450 = 150$

We know that $N = \frac{N_0}{2^n}$

$\Rightarrow \quad 2^n = \frac{N_0}{N} = \frac{600}{150} = 4 = 2^2$

$\Rightarrow \quad n = 2$

$n = \frac{t}{T_{1/2}} = 2$

$t = 2T_{1/2} = 2 \times 10 \text{ min} = 20 \text{ min}$

14. (3)

$h\nu = h\nu_0 + \frac{1}{2}mv^2$

$\nu = 2\nu_0$ let velocity $= V_1$

$h2\nu_0 = h\nu_0 + \frac{1}{2}mV_1^2 \qquad ...(1)$

$\nu = 5\nu_0$ let velocity $= V_2$

$h5\nu_0 = h\nu_0 + \frac{1}{2}mV_2^2$

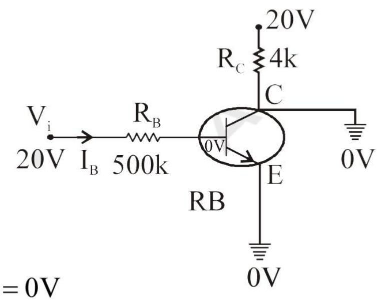
$\Rightarrow \quad 4h\nu_0 = \frac{1}{2}mV_2^2 \qquad ...(2)$

for (2) and (1)

$$\frac{4h\nu_0}{h\nu_0} = \frac{\frac{1}{2}mV_2^2}{\frac{1}{2}mV_1^2}$$

$4 = \frac{V_2^2}{V_1^2} \Rightarrow V_2 = 2V_1 \quad \Rightarrow \quad \frac{V_1}{V_2} = \frac{1}{2}$

15. (4)



$V_{BE} = 0V$

$V_{CE} = 0V$

$I_B = \frac{20V}{500 \times 10^3} = \frac{20 \times 10^6}{5 \times 10^5} \mu A = 40 \mu A$

$I_C = \frac{20V}{4 \times 10^3} = 5 \times 10^{-3} A = 5mA = 5000\mu A$

$\beta = \frac{I_C}{I_B} = \frac{5000\mu A}{40\mu A} = 125$

16. (4)

17. (2)

$y = A \cdot \bar{B} + \bar{A} \cdot B$

18. (2)

$\vec{V} = V\hat{i}$

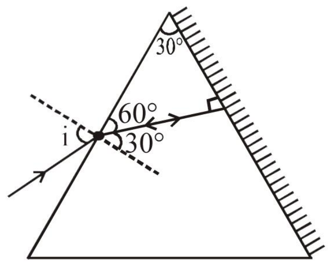
$\vec{E} = E\hat{j}$

Velocity of e.m. wave is along $\vec{E} \times \vec{B}$

This imply magnetic field intensity is along $+\hat{k}$

$\Rightarrow$ +ve z direction.

19. (2)



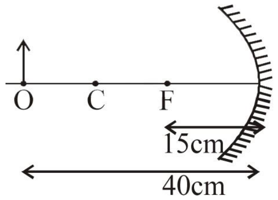
$\frac{\sin i}{\sin r} = \mu$

$\frac{\sin i}{\sin 30} = \sqrt{2}$

$\sin i = \sqrt{2} \sin 30 = \sqrt{2} \times \frac{1}{2} = \frac{1}{\sqrt{2}}$

$i = 45°$

20. (2)



u = –40cm
f = –15cm

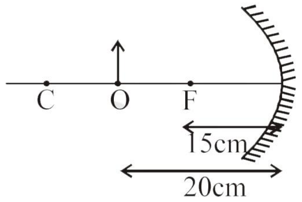
$$\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$$

$$\frac{1}{v}-\frac{1}{40}=-\frac{1}{15}$$

$$\frac{1}{v}=-\frac{1}{15}=-\frac{1}{40}$$

$$=\frac{-8+3}{120}=\frac{-5}{120}=\frac{-1}{24}$$

$v = -24cm$



u = –20cm
f = –15cm

$$\frac{1}{v}+\frac{1}{u}=\frac{1}{f}$$

$$\frac{1}{v}-\frac{1}{20}=\frac{1}{-15}$$

$$\frac{1}{v}=\frac{1}{20}-\frac{1}{15}$$

$$\frac{1}{v}=\frac{3-4}{60}\Rightarrow\frac{1}{v}=\frac{1}{60}\Rightarrow v=-60cm$$

Displacement of Image = 60–24=36cm away from mirror

21. (4)

$$U_L=\frac{1}{2}LI^2$$

$$25\times10^{-3}=\frac{1}{2}\times L\times(60\times10^{-3})^2$$

$$\frac{50\times10^{-3}}{3600\times10^{-6}}=L$$

$L = 13.89$ H

22. (3)

$$S=Ut+\frac{1}{2}at^2$$

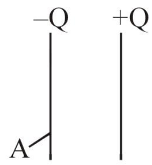
$$S=\frac{1}{2}at^2 \Rightarrow t=\sqrt{\frac{2s}{a}}$$

$$t=\sqrt{\frac{2h}{\frac{qE}{m}}}=\sqrt{\frac{2mh}{qE}}$$

$q_p = q_e$, E = constant, h = constant

$$t\,\alpha\sqrt{m}\Rightarrow\frac{t_e}{t_p}=\sqrt{\frac{m_e}{m_p}}\Rightarrow t_e<t_p$$

23. (3)

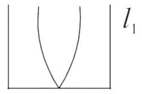


$$F=\frac{1}{2}QE=\frac{1}{2}Q\left(\frac{Q}{A\in_0}\right)$$

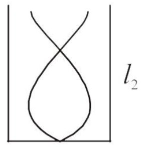
$$F=\frac{Q^2}{2\in_0 A}$$

24. (2)

$$\frac{\lambda}{4}=\ell_1+x$$



$$\frac{3\lambda}{4}=\ell_2+x$$



$$\frac{3\lambda}{4}-\frac{\lambda}{4}=\ell_2-\ell_1$$

$$\frac{\lambda}{2}=\ell_2-\ell_1$$

$$\lambda=2(\ell_2-\ell_1)$$

$$\lambda=2(73-20)=2\times53$$

$$\lambda=106cm$$

$$\nu=320Hz$$

$$\lambda=106cm=1.06m$$

$$V=\nu\lambda=320\times1.06=339m/s$$

25. (2)

$$a=-\omega^2x$$

$$|a|=\omega^2x$$

$$|a|=\frac{4\pi^2}{T^2}x \qquad \left[\because \omega=\frac{2\pi}{T}\right]$$

$$T^2=4\pi^2\frac{x}{a}$$

$$T=2\pi\sqrt{\frac{x}{a}}=2\pi\sqrt{\frac{5}{20}}$$

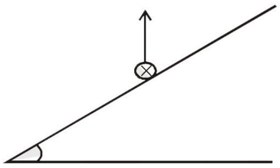
$$T=\frac{2\pi}{2}=\pi\sec$$

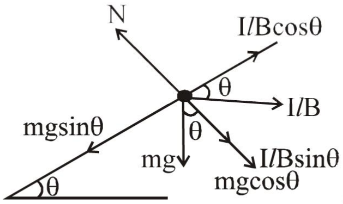
26. (4)

$\lambda = 0.5\text{kgm}^{-1}$

$\theta = 30°$

$B = 0.25T$





Rod at rest $\Rightarrow$

$I\ell B\cos\theta = mg\sin\theta$

$$I = \frac{m}{\ell}\frac{g}{\beta}\tan\theta$$

$$= 0.5 \times \frac{9.8}{0.25}\tan 30°$$

$I = 11.32A$

27. (3)

28. (3)

$V = 10\sin 314t$ ...(1)

$L = 20\text{mH} = 20 \times 10^{-3}\text{H}$

$C = 100\mu F = 10^{-4}F$

$R = 50\Omega$

$X_L = \omega L = 314 \times 20 \times 10^{-3} = 6.28\Omega$

$$X_C = \frac{1}{\omega C} = \frac{1}{314 \times 10^{-4}} = 31.85\Omega$$

$$|Z| = \sqrt{R^2 + (X_C - X_L)^2} = \sqrt{50^2 + (31.85 - 6.28)^2}$$

$|Z| = 56\Omega$

$$I_r = \frac{V_r}{|Z|} = \frac{\frac{10}{\sqrt{2}}}{56} = 126A$$

$P_{loss} = I_r^2 R = (.126)^2 \times 50 = 0.8W$

29. (1)

$$\text{Current sensitivity} = \frac{5\text{div}}{\text{mA}} = 5000\frac{\text{div}}{\text{Amp}}$$

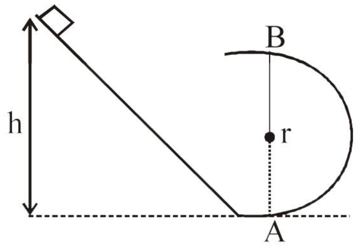
$$\text{Voltage sensitivity} = 20\frac{\text{div}}{\text{volt}}$$

$$\alpha_i = \frac{NAB}{C}$$

$$\alpha_V = \frac{NAB}{CR} = \frac{\alpha_i}{R}$$

$$\Rightarrow R = \frac{\alpha_i}{\alpha_v} = \frac{5000}{20} \Rightarrow R = 250\Omega$$

30. (4)



$2r = D$

$$r = \frac{D}{2}$$

To complete vertical circle

Velocity at 'A' is $V_A = \sqrt{5gr}$

from conservation of M.E.

$V_A = \sqrt{2gh}$

Now $\sqrt{2gh} = \sqrt{5gr}$

$2gh = 5gr$

$$h = \frac{5}{2}r$$

$$h = \frac{5}{4}D$$

31. (3)

$A \rightarrow$ solid sphere $I_A = \frac{2}{5}MR^2$

$B \rightarrow$ Disc $I_B = \frac{1}{2}MR^2$

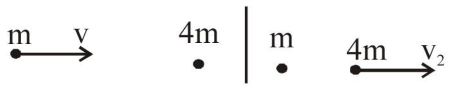
$C \rightarrow$ Ring $I_C = 1MR^2$

Now $I_C > I_B > I_A$

$\Rightarrow \quad (KE)_C > (KB)_B > (KE)_A$

$\Rightarrow \quad W_C > W_B > W_A$

32. (2)



$P_i = P_f$

$mv + 0 = 0 + 4mv_2$

$\Rightarrow \quad v_2 = \frac{v}{4}$

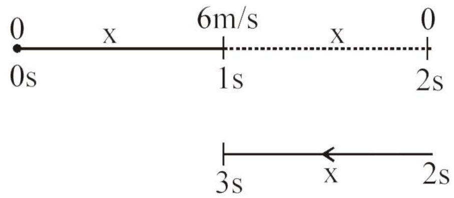
coefficient of restitution

$$e = \frac{v_2 - v_1}{u_1 - u_2} = \frac{\frac{u}{4} - 0}{u - 0} = \frac{1}{4}$$

$e = 0.25$

33. (4)

34. (2)



0s to 1s acceleration $a = \frac{qE}{m}$

1s to 2s retardation $a = -\frac{qE}{m}$

2s to 3s acceleration $a = \frac{qE}{m}$

0s to 1s Distance covered

$$s = \left(\frac{U+V}{2}\right)t$$

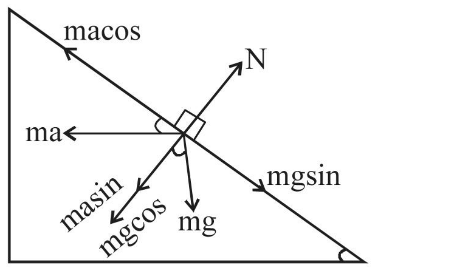
$$x = \left(\frac{0+6}{2}\right)(1) = 3m$$

0s to 3s Av. velocity $= \frac{3m}{3s} = \frac{1m}{sec}$

0s to 3s Av - speed $= \frac{9m}{3s} = 3\frac{m}{s}$

35. (4)

Reference: Incline Plane



Mass At rest $\Rightarrow$ $ma\cos\theta = mg\sin\theta$

$a = g\tan\theta$

36. (4)

$\vec{F} = 4\hat{i} + 5\hat{j} - 6\hat{k}$

Position vector of point of application of force

$\vec{r}_1 = 2\hat{i} + 0\hat{j} - 3\hat{k}$

Position vector of refrence

$\vec{r}_2 = 2\hat{i} + 2\hat{j} - 2\hat{k}$

$\vec{r} = \vec{r}_1 - \vec{r}_2$

$\vec{r} = 0\hat{i} + 2\hat{j} - 1\hat{k}$

Torque $\vec{\tau} = \vec{r} \times \vec{F}$

$$\vec{\tau} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 2 & -1 \\ 4 & 5 & -6 \end{vmatrix}$$

$$\vec{\tau} = \begin{vmatrix} 2 & -1 \\ 5 & -6 \end{vmatrix}\hat{i} - \begin{vmatrix} 0 & -1 \\ 4 & -6 \end{vmatrix}\hat{j} + \begin{vmatrix} 0 & 2 \\ 4 & 5 \end{vmatrix}\hat{k}$$

$$\vec{\tau} = -7\hat{i} - 4\hat{j} - 8\hat{k}$$

37. (4)

L.C. = 0.001cm = 0.01mm

MSR = 5mm

VSR = 25div

Diameter of ball = zero error + MSD + LC × VSR

$= 0.04 + 5 + 0.01 \times 25$

$= 0.04 + 5 + 0.25$

$= 5.29$ mm

$= 0.529$ cm

38. (4)

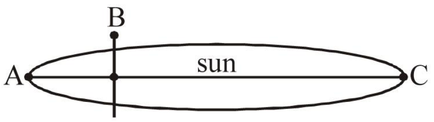
Angular Momentum L = constant

MOI $\quad I = \frac{2}{5}MR^2 \quad$ increase

$KE = \frac{1}{2}I\omega^2 = \frac{L^2}{2I} \quad$ decreases

$L = I\omega = \text{constant} \Rightarrow \omega = \frac{L}{I} \quad$ decreases

39. (2)



$K_A > K_B > K_C$

40. (4)

$M_{earth} = M(\text{Same})$

$g = \frac{GM}{R^2} \qquad M'_{sun} = \frac{M_{sun}}{10}$

$G' = 10G$

$g' = \frac{10GM}{R^2} = 10g$

(1) Time period of Pendulum

$T = 2\pi\sqrt{\frac{\ell}{g}}$

$T' = 2\pi\sqrt{\frac{\ell}{10g}} = \frac{T}{\sqrt{10}}$

Time period decreases

(2) Gravity of Earth increases

Walking becomes difficult

(3) As gravity increases

Velocity of rain drops increases

(4) g changes

41. (2)

$$\frac{K_{rot}}{K_{trans}} - \frac{K^2}{R^2} = \frac{2}{5} \Rightarrow \frac{K_{trans}}{K_{Total}} = \frac{5}{7}$$

42. (1)

The forces acting on the sphere are its weight $\frac{4}{3}\pi r^3 \rho g$ downwards, buoyancy force $\frac{4}{3}\pi r^3 \sigma g$ upwards, and viscous force $6\pi\eta r v$ upwards. The sphere attains the terminal velocity v_t when the resultant force on it is zero i.e.,

$$\frac{4}{3}\pi r^3 \rho g = \frac{4}{3}\pi r^3 \sigma g + 6\pi\eta r v_t$$

Solve above equation to get the terminal velocity,

$$v_t = \frac{2r^2 g(\rho - \sigma)}{9\eta}$$

The rate of heat generation is equal to the rate of work done by the viscous force which, in turn, is equal to its power. Thus,

$$\frac{dQ}{dt} = (6\pi r\eta v_t)(v_t) = \frac{8\pi(\rho-\sigma)^2 g^2 r^5}{27\eta}$$

43. (1)

$\text{Power} \, \alpha (T)^4 \qquad$ ...(1)

From Wein's Displacement Law

$\lambda_m T = b(\text{constant})$

$\lambda_0 T_1 = \frac{3\lambda_0}{4} T_2$

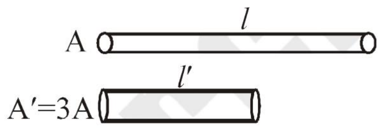
$\Rightarrow \frac{T_1}{T_2} = \frac{3}{4} \qquad$ ...(2)

$$\frac{(\text{Power})_1}{(\text{Power})_2} = \left(\frac{T_1}{T_2}\right)^4 = \left(\frac{3}{4}\right)^4 = \frac{81}{256}$$

$$\frac{P}{nP} = \frac{81}{256}$$

$$n = \frac{256}{81}$$

44. (3)



$V' = V$

$3Al' = Al$

$l' = \frac{l}{3}$

Same material $\Rightarrow Y' = Y$

Wen know that $Y = \frac{F/A}{(\Delta l)/l}$

$\Rightarrow F = \frac{YA(\Delta l)}{l}$ $Y = \text{Same},\ \Delta l = \text{Same}$

$F \propto \frac{A}{l}$

$\frac{F'}{F} = \frac{A'}{A} \times \frac{l}{l'} = \frac{3A}{A} \times \frac{l}{l/3} = \frac{9}{1}$

$F' = 9F$

45. (2)

$m = 0.1gm$

$Q = 54cal = 54 \times 4.18J = 225.72$

$V_f = 167.1cc$

$V_i = 0.1cc$

$\Delta V = V_f - V_i = 167cc = 167 \times 10^{-6} m$

$P = 1.013 \times 10^5 Nm^{-2}$

$W = P(\Delta V) = 1.013 \times 10^5 \times 167 \times 10^{-6}$

$= 1.013 \times 16.7$

$= 16.92\ Joule$

$Q = \Delta U + W$

$225.72 = \Delta U + 16.92$

$\Delta U = 208.8\ J$

CHEMISTRY

46. (3)

$HNO_3 = +5$
$NO = +2$
$N_2 = 0$
$NH_4Cl = -3$

47. (1)

MF_6^{-3}

Boron doesn't have vacant d-orbital so it can't have 6 covalury.

48. (1)

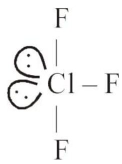
Ellingham diagram the metal which lie below can reduce metal which lie above to it.

49. (4)

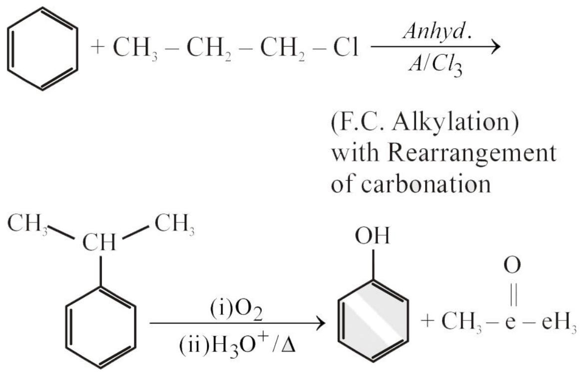
$B < Ga < Al < In < Tl$
$\downarrow$
due to poor shriding of d-orbitals

50. (2)

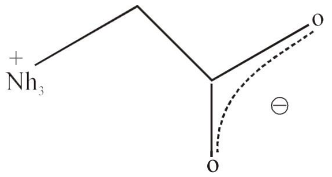
51. (2)



52. (4)



53. (4)



54. (4)

Regarding cross linked polyer

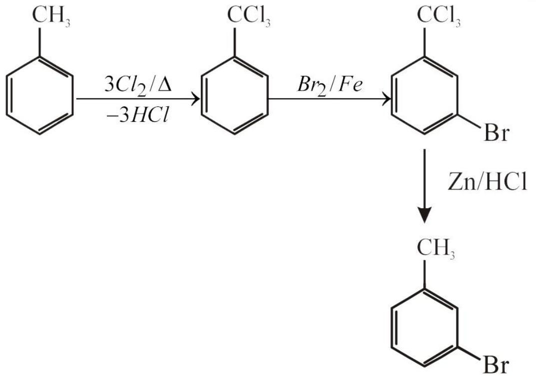
55. (4)

In acidic medium aniline is present as anilium ion.

56. (3) **57. (1)** **58. (2)**

59. (3) **60. (4)**

61. (3)



62. (4)

$CH_4 + Br_2 \rightarrow CH_3 - Br \xrightarrow[\text{ether}]{2Na} C_2H_6$

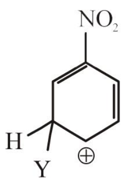
63. (2)

$CH_2 = CH - C \equiv CH$

$\uparrow \quad \uparrow \quad \uparrow \quad \uparrow$

$Sp^2 \quad Sp^2 \quad Sp \quad Sp$

64. (1)



$\Rightarrow$ 3 Resonatic structure

65. (3)

66. (4)

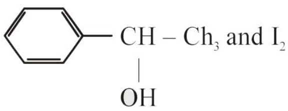
Carbylamine reaction

Intermediate = carbone (: CCl_2)

67. (4)

68. (1)

Haloform Reaction



69. (3)

$Co + 3 \Rightarrow d^6 = \sqrt{24} Bm.$

$Cr + 3 \Rightarrow d^3 = \sqrt{15} Bm.$

$Fe + 3 \Rightarrow d^5 = \sqrt{35} Bm.$

$Ni + 2 \Rightarrow d^8 = \sqrt{8} Bm.$

70. (4)

71. (2)

Iron Carboxy Fe(CO)s is

Mononuclear

72. (3)

The type of Isomerism.

geometrical isomerism

73. (2)

74. (4)

$75\text{mL} \frac{M}{5} \text{HCl} + 25\text{mL} \frac{M}{5} \text{NaOH}$

$$\frac{\cancel{75} \times \frac{1}{\cancel{5}} - \cancel{25} \times \frac{1}{\cancel{5}}}{100} = \frac{10}{100}$$

$= 10^{-1} = [H+]$

PH = 1

75. (1)

76. (3)

liquification of a_{gas} α, ‘a’

a → vander waal constant for pressure

<u>**Gas**</u>	<u>**a**</u>
NH_3	4.17
H_2	0.244
O_2	1.36
CO_2	3.59

So, NH_3 can be easily liquified.

77. (3)

solubility of $BaSO_4$, s = 2.42×10^{-3} g/L.

$= \frac{2.42}{233} \times 10^{-3}$ mol/L.

$BaSO_4(s) + H_2O(l) \rightleftharpoons Ba^{+2}(aq.) + SO_4^{-2}(aq.)$

t = 0	–	–
	s	s

t = t_{eq}.

$K_{sp} = [Ba^{+2}][SO_4^{-2}]$

$= s \times s = s^2 = \left(\frac{2.42}{233} \times 10 - 3\right)^2$

$= 1.08 \times 10^{-10} mol^2 / L^2$

78. (3)

In which case

18 ml of water $\Rightarrow$ m = v × d

m = 18 ml × 1 gml^{-1}

= 18g = 1 mol.

79. (2)

$$t_{\frac{1}{2}} \propto \frac{1}{(A_0)^{n-1}}$$

80. (3)

81. (4)

$$\overset{+5}{BrO_3^-} \xrightarrow{[\text{oxidation}]} \overset{+1}{HBrO}. \qquad E^0_{BrO_3^-/HBrO=1.5v}$$

$$\overset{+1}{HBrO} \xrightarrow{[\text{Reduction}]} \overset{0}{Br2} \qquad E^0_{HBrO/Br_2=1.595v}$$

Hence, HBrO has equal tendency for oxidation as well as reduction.

HBrO undergo disproposition reaciton.

82. (2)

$$\overset{+7}{MnO_4^-} + \overset{+3}{C_2O_4^{-2}} + H^+ \rightarrow Mn^{+2} + \overset{+4}{CO_2} + H_2O.$$

$$\underset{n = 5}{} \qquad \underset{\substack{n = 1\times2 \\ = 2}}{}$$

So, $MnO_4^- + 5C_2O_4^{-2} + 16H +$

$$\rightarrow 2Mn^{+2} + 10CO_2 + 8H_2O.$$

83. (3)

$$A_2(g) + B_2(g) \rightleftharpoons X_2(g), \Delta H = -x \text{ kJ}.$$

For formation of product, reaction should proceed in forward direction.

So, For exothermic reaction,

$T\downarrow \cdot K\uparrow \cdot$ so reaction proceeds in forward direction.

For the reaction, $Q_p = \dfrac{nx_2}{n_{A_2}.n_{B_2}}\left(\dfrac{n_T}{P_T}\right)$

On $P\uparrow, Q_P\downarrow$ and $Q_P < K_P$ so reaction proceeds in forward direction.

84. (2)

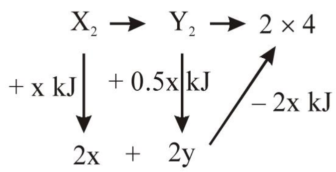
For zero order reaction,

$$\left(t_{1/2}\right)_{\text{initial}} = \frac{a_0}{2k}$$

$$\left(t_{1/2}\right)_{\text{final}} = \frac{2a_0}{2k} = 2\left(t_{1/2}\right)\text{initial.}$$

85. (1)

	ΔH
$X_2 \rightarrow 2X$	x. kJ.
$Y_2 \rightarrow 2Y$	0.5 x. kJ.
$XY \rightarrow X + Y$	x. kJ.



ΔH = 2 × (– 200)

= – 400 kJ

Apply Hess's law → a

$x + 0.5x - 2x = -400$

$-x/2 = -400$

$x = 800$ kJ.

86. (4)

'a' denotes, forces of attraction between gas molecules

87. (2)

	No. of electrons	Electronic configuation
CN^+	6 + 7 – 1 = 12	$(\sigma_{1s}^2\sigma_{1s}^2)(\sigma_{2s}^2\sigma_{2s}^2)(\sigma_{2p2}^2)(\pi_{2px}^1 = \pi_{2py}^1)$
CN^-	6 + 7 + 1 = 14	$(\sigma_{1s}^2\sigma_{1s}^2\sigma_{2s}^2\sigma_{2s}^2)(\sigma_{2p2}^2)(\pi_{2px}^1 = \pi_{2py}^1)$
NO	7 + 8 = 15	$(\sigma_{1s}^2\sigma_{1s}^2\sigma_{2s}^2\sigma_{2s}^2)(\sigma_{2p2}^2)(\pi_{2px}^1 = \pi_{2py}^1)(\pi_{2px}^{*1} = \pi_{2py}^{*})$
CN	6 + 7 = 13	$(\sigma_{1s}^2\sigma_{1s}^{*2}\sigma_{2s}^2\sigma_{2s}^{*2})(\sigma_{2p2}^2)(\pi_{2px}^2 = \pi_{2py}^1)$

So, B.O. for $CN^+ = \dfrac{N_b - N_a}{2} = \dfrac{8-4}{2} = 2$

B.O. for $CN^- = \dfrac{10-4}{2} = 3$

B.O. for $NO = \dfrac{10-5}{2} = 2.5$

B.O. for $CN = \dfrac{9-4}{2} = 2.5$

88. (4)

	Electronic	Configuration	Valency
Mg.	$1s^2\ 2s^2$	$2p^6\ 3s^2$	2
X.	$1s^2\ 2s^2$	$2p^3$	3

So, Mg + 2 & x – 3 will form E formula will be Mg_3X_2.

89. (1)

$$\text{density} = \frac{ZM}{N_A a^3}$$

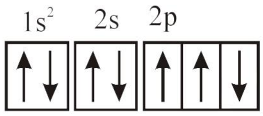
$$\text{For BCC, density} = \frac{2 \times M}{N_A \left(4R/\sqrt{3}\right)^3}, \quad z = 2., \ \sqrt{3}a = 4R.$$

$$\text{For FCC, density} = \frac{4 \times M}{N_A \times \left(4R/\sqrt{2}\right)^3}, \quad z = 4., \ \sqrt{2}a = 4R.$$

$$\frac{\text{density/BCC}}{\text{density/FCC}} = \frac{\dfrac{2M}{N_A\left(4R/\sqrt{3}\right)^3}}{\dfrac{4M}{N_A\left(4R/\sqrt{2}\right)^3}} = \frac{3\sqrt{3}}{4\sqrt{2}}$$

90. (1)

In option (1), Electronic configuration of N is



Hund's Rule is voilated

because acc. to Hund's Rule, when electrons arefilled in degenerate orbitals they have some spin quantum number.