ANSWER KEY
FULL TEST-06

PHYSICS

Q.1 (2)	**Q.2** (1)	**Q.3** (3)	**Q.4** (2)	**Q.5 (3)**	**Q.6** (1)	**Q.7** (1)	**Q.8** (3)	**Q.9** (1)	**Q.10** (3)
Q.11 (4)	**Q.12** (4)	**Q.13** (2)	**Q.14** (1)	**Q.15** (1)	**Q.16** (4)	**Q.17** (2)	**Q.18** (2)	**Q.19** (3)	**Q.20** (3)
Q.21 (1)	**Q.22** (2)	**Q.23** (1)	**Q.24** (3)	**Q.25** (2)	**Q.26** (4)	**Q.27** (2)	**Q.28** (2)	**Q.29** (2)	**Q.30** (2)
Q.31 (4)	**Q.32** (3)	**Q.33** (2)	**Q.34** (4)	**Q.35** (4)	**Q.36** (4)	**Q.37** (2)	**Q.38** (1)	**Q.39** (2)	**Q.40** (3)
Q.41 (3)	**Q.42** (1)	**Q.43** (3)	**Q.44** (4)	**Q.45** (4)					

CHEMISTRY

Q.46 (1)	**Q.47** (4)	**Q.48** (4)	**Q.49** (3)	**Q.50** (1)	**Q.51** (4)	**Q.52** (2)	**Q.53** (2)	**Q.54** (4)	**Q.55** (3)
Q.56 (4)	**Q.57** (3)	**Q.58** (1)	**Q.59** (4)	**Q.60** (4)	**Q.61** (1)	**Q.62** (1)	**Q.63** (2)	**Q.64** (3)	**Q.65** (3)
Q.66 (2)	**Q.67** (4)	**Q.68** (3)	**Q.69** (1)	**Q.70** (4)	**Q.71** (3)	**Q.72** (4)	**Q.73** (1)	**Q.74** (1)	**Q.75** (3)
Q.76 (2)	**Q.77** (1)	**Q.78** (1)	**Q.79** (1)	**Q.80** (2)	**Q.81** (4)	**Q.82** (4)	**Q.83** (1)	**Q.84** (3)	**Q.85** (2)
Q.86 (3)	**Q.87** (4)	**Q.88** (1)	**Q.89** (1)	**Q.90** (4)					

BIOLOGY

Q.91 (3)	**Q.92** (3)	**Q.93** (1)	**Q.94** (1)	**Q.95** (3)	**Q.96** (3)	**Q.97** (3)	**Q.98** (4)	**Q.99** (1)	**Q.100** (4)
Q.101 (3)	**Q.102** (2)	**Q.103** (3)	**Q.104** (1)	**Q.105** (3)	**Q.106** (2)	**Q.107** (2)	**Q.108** (2)	**Q.109** (3)	**Q.110** (3)
Q.111 (3)	**Q.112** (4)	**Q.113** (3)	**Q.114** (3)	**Q.115** (1)	**Q.116** (1)	**Q.117** (1)	**Q.118** (2)	**Q.119** (1)	**Q.120** (1)
Q.121 (1)	**Q.122** (4)	**Q.123** (3)	**Q.124** (1)	**Q.125** (2)	**Q.126** (1)	**Q.127** (3)	**Q.128** (3)	**Q.129** (4)	**Q.130** (3)
Q.131 (3)	**Q.132** (2)	**Q.133** (4)	**Q.134** (2)	**Q.135** (4)	**Q.136** (1)	**Q.137** (4)	**Q.138** (3)	**Q.139** (4)	**Q.140** (4)
Q.141 (4)	**Q.142** (3)	**Q.143** (2)	**Q.144** (4)	**Q.145** (3)	**Q.146** (3)	**Q.147** (4)	**Q.148** (2)	**Q.149** (4)	**Q.140** (2)
Q.151 (4)	**Q.152 (3)**	**Q.153** (4)	**Q.154 (3)**	**Q.155** (4)	**Q.156** (3)	**Q.157** (4)	**Q.158** (1)	**Q.159** (4)	**Q.160** (3)
Q.161 (2)	**Q.162** (3)	**Q.163** (2)	**Q.164** (2)	**Q.165** (3)	**Q.166** (3)	**Q.167** (4)	**Q.168** (3)	**Q.169** (4)	**Q.170** (3)
Q.171 (4)	**Q.172** (4)	**Q.173** (3)	**Q.174** (1)	**Q.175** (3)	**Q.176** (3)	**Q.177** (2)	**Q.178** (3)	**Q.179** (1)	**Q.180** (4)

Hints & Solutions

Q.1 (2)

$$y = \frac{z}{r}e^{-zt}$$

$$[y] = \left[\frac{z}{r}\right]$$

$$[zt] = [M^0L^0T^0] \Rightarrow [Z] = [T^{-1}]$$

$$[r] = \left[\frac{z}{y}\right] = \left[\frac{T^{-1}}{L^1}\right]$$

$$[r] = [L^{-1}T^{-1}]$$

Q.2 (1)

$$\text{Average speed} = \frac{\text{total distance}}{\text{total time}}$$

$$48 = \frac{x + x}{\frac{x}{60} + \frac{x}{v}}$$

$$\frac{x}{60} + \frac{x}{v} = \frac{2x}{48} \Rightarrow \frac{1}{v} = \frac{-1}{60} + \frac{1}{24} = \frac{-2+5}{120}$$

$$v = \frac{120}{3} = 40\,\text{km/hr}$$

Q.3 (3)

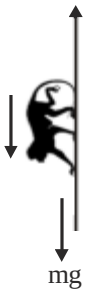
$$\frac{V}{V_2} = \frac{1}{\sqrt{2}} \Rightarrow V_1 = V \Rightarrow V_2 = \sqrt{2}V$$

Acquires same height. So, $(Vy)_1 = (Vy)_2$

$$V\sin 45° = \sqrt{2}V\sin\theta$$

$$\sin\theta = \frac{1}{2} \Rightarrow \theta = 30°$$

Q.4 (2)



Applying Newton's second law

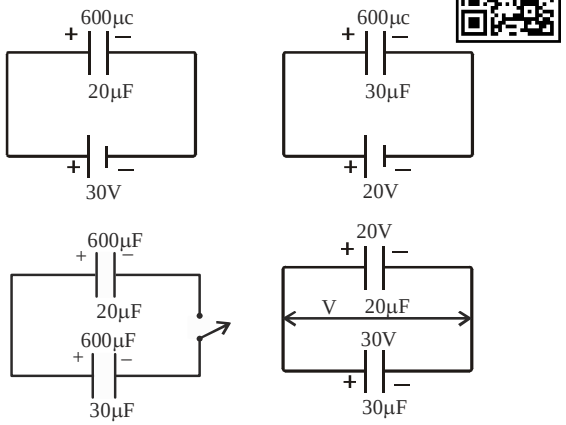
$mg - T = ma$

$T = m(g - a)$

$250 = 50(10 - a)$

$5 = 10 - a \Rightarrow a = 5\ m/s^2$

Q.5 **(3)**

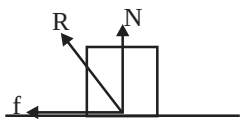


From charge conservation 600 + 600 = 20V + 30 V

50 V = 1200

V = 24 Volt

Q.6 (1)



Contact force,

$$R = \sqrt{N^2 + f^2}$$

$$= \sqrt{N^2 + (\mu N)^2}$$

$$= N\sqrt{1+\mu^2}$$

$R > f$

Q.7 (1)

$$W_{all} = \frac{1}{2}m\left(v_f^2 - 0^2\right)$$

(W_{all} = Area from x = 0 to x = 25)

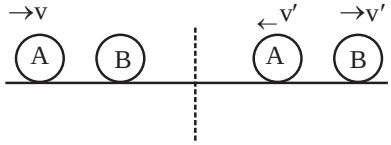
$$25 \times 10 = \frac{1}{2} \times 5 \left(v_f^2\right)$$

$$v_f^2 = \frac{25 \times 2 \times 10}{5}$$

$$v_f^2 = 100$$

$$v_f = 10 m/s$$

Q.8 (3)



$$e = 1 = \frac{v_2 - v_1}{u_1 - u_2} \qquad m_A v = -m_A v^1 + m_B v^1$$

$$1 = \frac{v' - (-v')}{v - 0} \qquad m_A (v + v') = m_B v'$$

$$2v' = v \qquad \frac{m_A}{m_B} = \frac{v'}{v + v'} = \frac{v'}{(2v') + v'} = \frac{1}{3}$$

Q.9 (1)

For paramagnetic substances susceptibility is small and positive.

$$\chi_m > 0$$

$$\mu_r = 1 + \chi_m > 1$$

Q.10 (3)

Loss in potential energy = gain in kinetic energy

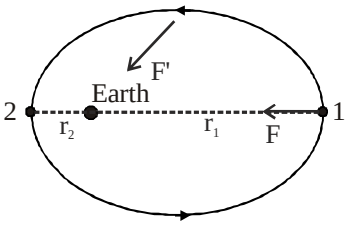
$$mgh = \frac{1}{2}mv^2 + \frac{1}{2}I\omega^2$$

$$mgh = \frac{1}{2}mv^2 + \frac{1}{2}\left(\frac{MR^2}{2}\right)\frac{v^2}{R^2}$$

$$4mgh = 2mv^2 + mv^2$$

$$v = \sqrt{\frac{4mgh}{2m + M}}$$

Q.11 (4)



Torque of gravitational force on satellite is zero about centre of earth. Therefore Angular Momentum of satellite remains conserved about centre of Earth.

$\therefore L_1 = L_2$

From Energy conservation Þ

$K_1 + U_1 = K_2 + U_2$

$$K_1 - \frac{GMm}{r_1} = K_2 - \frac{GMm}{r_2}$$

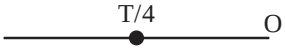
$$K_2 = K_1 + GMm\left(\frac{1}{r_2} - \frac{1}{r_1}\right)$$

$$\because r_2 < r_1 \Rightarrow GMm\left(\frac{1}{r_2} - \frac{1}{r_1}\right) = + \text{positve}$$

$\Rightarrow K_2 > K_1$

Q.12 (4)

$x = 4\cos 4\pi t$



$\omega = 4\pi$

$$\frac{2\pi}{T} = 4\pi \Rightarrow T = \frac{1}{2}\text{sec}$$

$$t = \frac{T}{4} = \frac{1}{8}\text{sec}$$

Q.13 (2)

8 gm ice – 15°C

$Q_1 = ms_{ice}\Delta T$
$= 8 \times 1/2 \times 15 = 60$ Cal

8 gm ice 0°C

$Q_2 = mL_f$
$= 8 \times 80 = 640$ Cal

8 gm water at 0°C

$Q_3 = ms_w\Delta T$
$= 8 \times 80 = 640$ Cal

8 gm water at 100°C

$Q_4 = mL_v$
$= 8 \times 540$
$= 4320$ Cal

8 gm steam at 100°C

So heat required
$Q = Q1 + Q2 + Q3 + Q4$
$= (60 + 640 + 800 + 4320)$ cal
$= 5820$ cal Ans. (2)

Q.14 (1)
Density of a nucleus is independent of mass number

Q.15 (1)
Average translational Kinetic energy $\propto T$

Translational kinetic energy, $E = \frac{3}{2}kT$

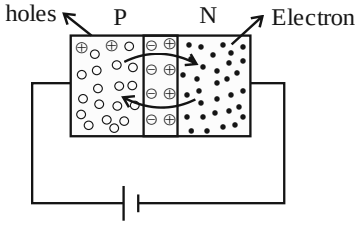
$$E \propto T$$

$$\frac{E_1}{E_2} = \frac{T_1}{T_2}$$

$$\frac{6.21\times10^{-21}}{E_2} = \frac{300}{600}$$

$E_2 = 12.42 \times 10^{-21}$ J

Q.16 (4)



Electrons are driven from N side to P side and similarly holes are driven from P-side to N-side
$\therefore$ Majority charge carrier on both sides of the junction are driven towards the junction.
Hence width of the depletion layer decreases.

Q.17 (2)

Q.18 (2)

We know,

$$B = -V\frac{dp}{dV}$$

$$B = -\frac{10\times10^6}{-\frac{0.2}{100}} = 5 \times 10^9 \text{ Pa}$$

$B = 5$ GPa

Q.19 (3)
Volumetric expansion $= \beta_1 + 2\beta_2$

Q.20 (3)

Q.21 (1)

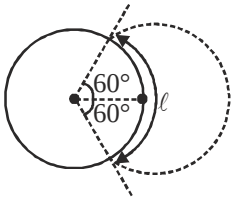
Q.22 (2)

$$V_T \propto \frac{(\rho_0 - \rho_\ell)}{\eta}$$

$$\frac{10}{0.0625} = \frac{\eta_g}{(8.5\times10^{-4})}\left(\frac{7.8-1}{7.8-1.2}\right)$$

$\eta_g = 0.132$ Pa-sec

Q.23 (1)



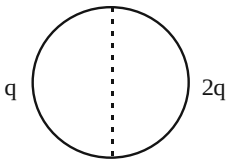
$\therefore$ Charge distributed in $2\pi r = Q$

$\therefore$ Charge distributed in $2\pi r = \frac{2\pi r}{3} = \frac{Q}{2\pi r}\times\frac{2\pi r}{3} = \frac{Q}{3}$

$$\phi_s = \frac{q_{in}}{\varepsilon_0}$$

$$\phi_s = \frac{q_{in}}{3\varepsilon_0}$$

Q.24 (3)



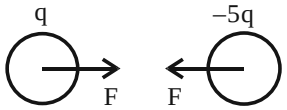
Potential at a distance on the axis of ring is given by formula

$$V = \frac{KQ}{\sqrt{R^2 + X^2}} :$$

Here, Q is a total charge on the ring.
It is independent of distribution of charge.

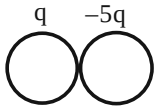
$$v = \frac{K(q+2q)}{\sqrt{R^2 + \left(2\sqrt{2}R\right)^2}} = \frac{Kq}{R}$$

Q.25 (2)

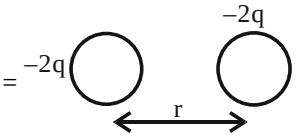


$$F = \frac{K(q)(-5q)}{r^2}$$

$$F = \frac{-5Kq^2}{r^2} \text{ .....(1)}$$



After touching charge will flow till potential of both becine some As both are icentical then charge will equally distribonte . $\frac{q-5q}{2}$



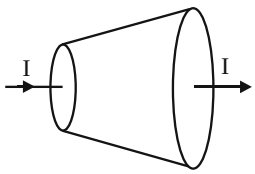
$$F^1 = \frac{K(-2q)(-2q)}{r^2} = \frac{4Kq^2}{r^2} \text{ .....(2)}$$

Dividing eq(2) and (1)

$$\frac{F^1}{F} = \frac{4}{5}$$

$$F^1 = \frac{4F}{5}$$

Q.26 (4)

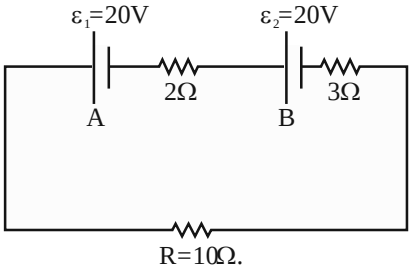


Current flow is constant.
$\therefore i = neAV_d = \text{constant}$

$$\therefore \boxed{V_d \propto \frac{1}{A}}$$

$\therefore A \uparrow V_d \downarrow$

Q.27 (2)



Current flow in the circuit

$$i = \frac{\varepsilon_1 + \varepsilon_2}{R_{eq}}$$

$$i = \frac{20+20}{2+3+10} = \frac{40}{15} = \frac{8}{3}A$$

Potential difference across cell B

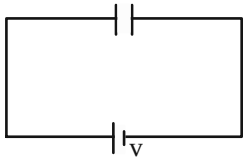
$$\Delta V = \varepsilon_B - ir_B$$

$$= 20 - \left(\frac{8}{3}\right)(3)$$

$$= 12V$$

Ans. (2)

Q.28 (2)



Potential difference across the plates is v which is constant

$$\therefore \text{Electric field}, E = \frac{v}{d} \Rightarrow E \propto \frac{1}{d}$$

As $d \uparrow$ $E \downarrow$

Q.29 (2)

$$R = \frac{V^2}{P} \Rightarrow R_1 = \frac{200 \times 200}{100} = 400\Omega$$

$$\text{and } R_2 = \frac{100 \times 100}{200} = 50\Omega$$

$$\text{Maximum current rating } i = \frac{P}{V}$$

$$\text{So, } i_1 = \frac{100}{200} \text{ and } i_2 = \frac{200}{100} \Rightarrow \frac{i_1}{i_2} = \frac{1}{4}$$

Q.30 (2)

$B = \mu_0\mu_r ni$

$= (4\pi \times 10^{-7})(400) \times 2000 \times 4 \cong 4T$

Q.31 (4)

$q = 10^{-16}\,C$

$B = B_0\hat{i} + 4B_0\hat{j}$

$V = 2\hat{i} + 4\hat{j}$

$F = q\left(\vec{V} \times \vec{B}\right)$

$$3\times10^{-16}k = 10^{-16}\begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 2 & 4 & 0 \\ B_0 & 4B_0 & 0 \end{vmatrix}$$

$3\hat{k} = \left(8B_0 - 4B_0\right)\hat{k}$

$4B_0 = 3$

$B_0 = \dfrac{3}{4} = 0.75T$ **Ans. (4)**

Q.32 (3)

Indueced emf in primary coil

$$e_p = \left(\frac{d\phi}{dt}\right) = \frac{d(\phi_0 + 4t)}{dt}$$

$e_p = 4V$

$N_p = 4$

$$\phi = \frac{4}{N_p} = \frac{4}{500}$$

Output voltage, $e_s = N_s f$

$$= 1500 \times \frac{4}{500} = 12V$$

Q.33 (2)

$\Delta\phi = \phi_f - \phi_i$

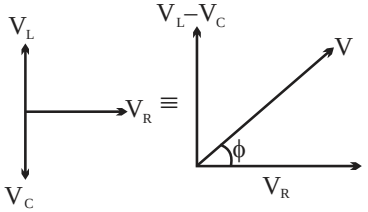
$= BA\cos0^o - BA\cos 180^o$

$= 2BA$

$$e = \frac{\Delta\phi}{\Delta t} = \frac{2BA}{\Delta t} = \frac{2\times2\times10\times10^{-4}}{0.01} = 0.4V$$

Q.34 (4)

$V_R = 40V,\ V_C = 60V,\ V_L = 30V$



$V = \sqrt{V_R^2 + \left(V_C - V_L\right)^2}$

$= \sqrt{40^2 + \left(60-30\right)^2} = 50$

power factor $\cos\phi = \dfrac{V_R}{V} = \dfrac{40}{50} = \dfrac{4}{5} = 0.8$

Q.35 (4)

$\cos\phi = \dfrac{R}{Z}$

$\cos\phi = 1$ (Given)

So, $Z = R$

Q.36 (4)

$m_0 = 8,\ m = 96$

$m = m_0 m_e$

$m_e = \dfrac{m}{m_0} = \dfrac{96}{8} = 12$

Q.37 (2)

$\mu = \dfrac{3}{2}$

$\dfrac{1}{f} = (\mu_1 - 1)\left(\dfrac{1}{R_1} - \dfrac{1}{R_2}\right)$ (f = 20 cm)

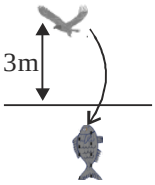
$\dfrac{1}{20} = \dfrac{1}{f} = \left(\dfrac{3}{2} - 1\right)\left(\dfrac{1}{R_1} - \dfrac{1}{R_2}\right) = \dfrac{1}{2}\left(\dfrac{1}{R_1} - \dfrac{1}{R_2}\right)$ ....(i)

$\dfrac{1}{f'} = \left(\dfrac{3/2}{5/2} - 1\right)\left(\dfrac{1}{10}\right) = \left(\dfrac{6}{10} - 1\right)\left(\dfrac{1}{10}\right) = \dfrac{2}{50}$ .....(ii)

$$\frac{f'}{f} = \frac{\frac{1}{2}}{-\frac{2}{5}} = -\frac{5}{4}$$

$f' = -\dfrac{5}{4} \times 20 = -25$ cm.

Q.38 (1)



$d_{app} = \dfrac{d_{actual}}{n_i} \times n_r$

$= \dfrac{3}{1} \times \dfrac{4}{3} = 4$

Q.39 (2)

When transparent plate is placed is front of one slit, then path difference

$\Delta X = (\mu - 1)t = d\sin\theta \left(\therefore \sin\theta \simeq \tan\theta = \dfrac{y}{D}\right)$

$$(\mu-1)t=\frac{dy}{D}$$

$$y=\frac{(\mu-1)tD}{d}$$

$$\frac{6}{1000}=\frac{(\mu-1)\times10^{-3}\times20\times10^{-2}}{3\times10^{-3}}$$

$$\mu-1=\frac{9}{100}$$

$\mu=1.09$ Ans (2)

Q.40 (3)

Stopping potential and maximum kinetic energy is independent of intensity. It depends on frequency of incident radiation. Photo electric current depends on intensity.

Q.41 (3)

Paschen series for shortest wavelength of paschen n = ∞ to n = 3 transition occurs.

$$\therefore\ \frac{1}{\lambda}=Rz^2\left[\frac{1}{3^2}-\frac{1}{\infty^2}\right]$$

$$\frac{1}{\lambda}=Rz^2\left[\frac{1}{9}\right] \qquad ...(1)$$

$$\Rightarrow Rz^2=\frac{9}{\lambda}$$

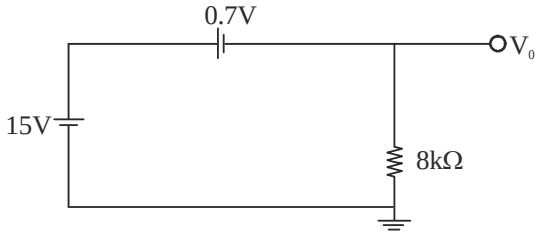
For longest wavelength of lymen series ; n = 2 to n = 1 transition

$$\frac{1}{\lambda'}=Rz^2\left[\frac{1}{1^2}-\frac{1}{2^2}\right]=\frac{3}{4}Rz^2 \qquad ...(2)$$

$$\Rightarrow \lambda'=\frac{4\lambda}{27}$$

Q.42 (1)

Si diode is in forward biased condition while Ge diode is in reverse biased condition.

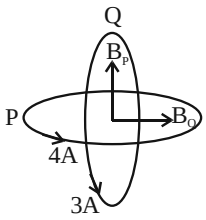


$V_0=15-0.7$

$=14.3\,V$

$$i=\frac{14.3}{8\times10^3}=1.8mA$$

Q.43 (3)



$$B_P=\frac{\mu_0 I_2}{2R}$$

$$=\frac{4\pi\times10^{-7}\times4}{2\times0.02\pi}=4\times10^{-5}\ Wb/m^2$$

$$B_Q=\frac{\mu_0 I_1}{2R}$$

$$=\frac{4\pi\times10^{-7}\times3}{2\times0.2\pi}$$

$$=3\times10^{-5}Wb/m^2$$

$$\therefore\ B=\sqrt{B_P^2+B_Q^2}$$

$$=\sqrt{\left(4\times10^{-5}\right)^2+\left(3\times10^{-5}\right)^2}$$

$$=5\times10^{-5}Wb/m^2$$

Q.44 (4)

$29\,MSD=30\,VSD$

$$1VSD=\frac{29}{30}MSD$$

Least count = 1 MSD – 1 VSD

$$=1\,MSD-\frac{29}{30}MSD$$

$$=\frac{1}{30}MSD$$

Given that 1 MSD = 1°

$$LC=\frac{1}{30}\times1^\circ=\frac{1}{30}\times60\,min=2\,min$$

Q.45 (4)

$$\rho=\frac{\pi r^2R}{\ell}$$

$$\frac{\Delta\rho}{\rho}=2\frac{\Delta r}{r}+\frac{\Delta R}{R}+\frac{\Delta\ell}{\ell}$$

$$=2\left(\frac{0.02}{0.24}\right)+\frac{1}{30}+\frac{0.01}{4.8}$$

$$\frac{\Delta\rho}{\rho}=0.20$$

$$\frac{\Delta\rho}{\rho}\times 100 = 20\%$$

Q.46 (1)

	X	Y
	xy_3	xy_5
Mole	0.2	0.1
weight	18.5 gm	13.05

$$\text{Mole} = \frac{\text{wt.}}{\text{Mwt.}}$$

So

for xy_3 for xy_3

$$0.2 = \frac{18.5}{x+3y} \quad \& \quad 0.1 = \frac{13.05}{x+5y}$$

$0.2x + 0.64y = 18.5..(1)$ & $0.1x + 0.5y = 13.05 .... (2)$

After solving (1) & (2)

$x = 35.5$

$y = 19$

Q.47 **(4)**

$$\Delta E = 2E - E = \frac{hc}{\lambda} \quad ...(1)$$

$$\Delta E = \frac{4E}{3} - E = \frac{hc}{\lambda^1} \quad ...(2)$$

$$\frac{1}{2}\quad \frac{E}{\frac{E}{3}} = \frac{hc}{\lambda}\times\frac{\lambda^1}{hc}$$

$$3 = \frac{\lambda^1}{\lambda} \Rightarrow \lambda^1 = 3\lambda$$

Q.48 **(4)**

$PE = -1.7\ eV$

$$T.E = \frac{PE}{2} = \frac{-1.7}{2} = -0.85$$

$$\therefore E_n = \frac{-13.6}{n^2}, n^2 = \frac{13.6}{0.85}$$

i.e. the energy of n = 4

So excited state is 3rd

Q.49 (3)

$K = 231\ pm$

$Sr = 215\ pm$

Q.50 (1)

A hybrid orbital formed from s and p-orbital can contribute of σ-bond only due to symmetrical head-on overlapping.

Q.51 (4)

N_2 is more stable than F_2 due to stronger bond.

N_2 has B.O. 3

F_2 has B.O. 1

Bond strength ∝ Bond order

Q.52 **(2)**

It does ot make exact predictions regarding the tetra hedral and sqaure planar structures of 4- coordinate complex.

Q.53 (2)

$\Delta H_f^0(CO_2) = \Delta H_{rx^n}^0$ when .

- Product is forming 1 mole
- Product formed by its elements
- Element present in most stable Commor occuring form

So in 2nd reaction this is happen

Q.54 (4)

$q = 100\ J,\ w = -30\ J$

$\Delta U = q + w$

$AU = 100 - 30 = 70\ J$

Q.55 (3)

$v_1 = 2\ell,\ v_2 = 6l$

$P_{ext} = 5\ atm.$

$W = P_{ext.}(dv)$

$= -5(v_2 - v_1)$

$= -5(6-2)$

$= -20\ \ell\ atm.$

Q.56 (4)

(i) $NH_4OH + HCl \rightarrow NH_4OH + H_2O$

4 5 – –

0 5 – 4 4

Not buffer

(ii) $HCN + NaOH \rightarrow NaCN + H_2O$

1 2 – –

0 2–1 1

Basic solution

(iii) $HCl + NaOH \rightarrow SA + SB$

No buffer

(iv) $NH_4OH + HCl \rightarrow NH_4Cl + H_2O$

4 1 – –

4–1 0 1

Basic buffer

Option (4)

Q.57 (3)

$$A + B \rightleftharpoons C + 2D$$

t = 0 0.5 0.5 – –

$t = eq^m$ 0.5 – 0.1 0.5 – 0.1 0.1 0.2

$\because$ 20% of 0.5 = 0.1

$$keq^m = \frac{(0.1)(0.2)^2}{(0.4)^2} = 0.025$$

Q.58 (1)

$K_2\overset{+6}{Cr_2}O_7 + Sn^{+2} \rightarrow Sn^{+4} + Cr^{+3}$

$n_f = 6 \quad 2$

equivalent of $K_2Cr_2O_7$ = equivalent of Sn^{+2}

mole × 6 = 1 × 2

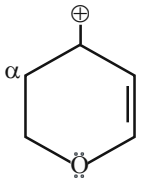
$$\text{mole} = \frac{2}{6} = \frac{1}{3}$$

Q.59 **(4)**

$-NO_2 \rightarrow -M/-I \quad -COOH \rightarrow -M/-I$

$-CN \rightarrow -M/-I \quad -CH_3 \rightarrow +H/+I$

Q.60 (4)



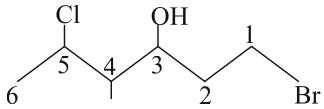
— O — → Show –I effect

Cojugated system is present $\left\{\begin{matrix}\pi\ \sigma\ \oplus \\ \text{and}\quad \pi\ \sigma\ ..\end{matrix}\right\}$

So Resonance

$C^{\oplus}$ has 2 α – H so show hyperconjugation

Q.61 (1)



—OH→PFG

1 -bromo-5-chloro-4-methyl hexan-3-ol

Q.62 (1)

$$CH_3CH_2CH=CH_2 \xrightarrow[\text{Peroxide}]{\text{H-Br}} CH_3-CH_2-\underset{H}{CH}-\underset{Br}{CH_2}$$

(FRAR)

1-bromo butane

According to Anti M.K. – Rule

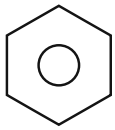
Q.63 (2)

$$\begin{matrix}CH_3\\ H_3C\end{matrix}\!\!>C=CH_2 \xrightarrow{KMnO_4/H^{\oplus}} \begin{matrix}CH_3\\ H_3C\end{matrix}\!\!>C=O + CO_2 + H_2O$$

molecular mass of CO_2 = 44

Q.64 (3)

$$\begin{matrix}Br & Br\\ | & |\\ CH-CH\\ | & |\\ Br & Br\end{matrix} \xrightarrow[-2ZnBr_2]{Zn/\Delta} CH\equiv CH \xrightarrow[\text{Fe-tube}]{\text{Red Hot}}$$



dehalogenation cyclic polymerisation

Q.65 **(3)**

(A) $i = 1 + (n-1)\alpha = 1 + (4-1) \times 0.8 \Rightarrow 3.4$

(B) $i = 1 + (n-1)\alpha = 1 + (3-1) \times 0.9 \Rightarrow 2.8$

(C) $2CH_3COOH \xrightarrow{\text{Benzene}} (CH_2COOH)_2$

(D) $i = 1 + (5-1) \times 0.7 \Rightarrow 3.8$

Q.66 **(2)**

$\Pi_1 = \Pi_2 \Rightarrow C_1RT = C_2RT$

$$\frac{8}{342} \times \frac{1000}{100} = \frac{5}{M_{wt}} \times \frac{1000}{100}$$

$$M_{wt} = \frac{342 \times 5}{8} = 213.75\text{gm}$$

Q.67 (4)

(i) $K = Sm^{-1}$

$\lambda_{eq.} = Sm^2\,eq^{-1}$

$\lambda_M = Sm^2\,mol^{-1}$

$G^* = m^{-1}$

Q.68 **(3)**

$$A: H_2 \rightarrow 2H^+ + 2e^-$$
$$C: 2H^+ + 2e^- \rightarrow H_2$$
$$H_2 + 2H^+ \rightarrow 2H^+ + H_2$$
$$4\text{atm}\ (0.1\text{M})\ \ (0.1\text{M})1\text{atm}$$

$$E = E^o - \frac{0.0591}{2}\log\frac{P_{H_2}}{P_{H_2}}$$

$$= 0 - \frac{0.0591}{2}\log\frac{1}{4}$$

$$= +\frac{0.06}{2} \times 0.60 = 0.018\,\text{v}$$

Q.69 (1)

$$\frac{-d[A]}{dt} = k[A]^1$$

Q.70 (4)

$r = k[A][B]$

$$r^1 = k\left(\frac{1}{\frac{1}{4}}\right)\left(\frac{1}{\frac{1}{4}}\right)$$

$r^1 = k \times 16$

16 times

Q.71 (3)

$4A + B \rightarrow 2C + 2D$

$$= \frac{1}{4}\left(\frac{-d[A]}{dt}\right) = \frac{-d[B]}{dt} = \frac{1}{2}\frac{d[C]}{dt} = \frac{1}{2}\frac{d[D]}{dt}$$

$$\frac{\text{R.O.D. of A}}{4} = \frac{\text{R.O.D. of B}}{1} = \frac{\text{R.O.A. of C}}{2} = \frac{\text{R.O.A. of D}}{2}$$

Q.72 (4)

Facts

Q.73 (1)

CCl_4 is not readily hydrolysed due to non-availability of d-orbital in carbon.

Q.74 **(1)**

$Ti^{+2} \rightarrow 3d^2 \rightarrow n=2$

$\mu = \sqrt{2(2+2)} = \sqrt{8} = 2.83 B.M.$

$Cr^{+3} \rightarrow 3d^3 \Rightarrow \mu = 3.87$ B.M.

$Zn^{+2} \rightarrow 3d^{10} \Rightarrow \mu = 0$ B.M.

$Co^{+2} \rightarrow 3d^7 \rightarrow \mu = 3.87$ B.M.

Q.75 **(3)**

they have high melting points than pure metals .

Q.76 **(2)**

On moving left to Right in a period ionic Radii dereases.

$La^{+3} > Eu^{+3} > Ho^{+3} > Tm^{+3}$

Q.77 **(1)**

$K_3[Cr(C_2O_4)_3]$

Potassium trioxalatochromate(III)

Q.78 **(1)**

(i)$[Fe(CN)_6]^{3-} \rightarrow CN^- \rightarrow$ S.F.L .(d^2SP^3)

$t_{2g}^5 e_g^0$,1 unpaired e^-

$\mu = \sqrt{3}$ B.M. paramagnetic, low spin complex.

(ii)$[CoF_6]^{3-} \rightarrow F^-$ (W.F.L.)$\rightarrow Sp^3d^2$

$t_{2g}^4 e_g^2 \rightarrow 4$ unpaired e^-

$\mu = \sqrt{24}$ B.M., low spin complex, Para magnetic.

(iii) $[Co(NH_3)_6]^{3+} \rightarrow d^2sp^3$, $t_{2g}^6 e_g^0$

$\mu = 0$, low spin complex , Diamagnetic

(iv) $[Mn(H_2O)_6]^{2+} \rightarrow t_{2g}^3 e_g^2 \rightarrow sp^3d^2$

$\mu = \sqrt{35}$ B.M. high spin complex, Paramagnetic .

Q.79 **(1)**

molar conductivity $\propto$ No of electrolytes

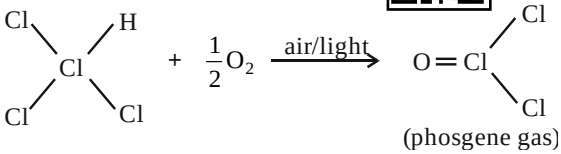
$[Co(NH_3)_6]Cl_3 \rightarrow 1:3$ electrolytes

$[Co(NH_3)_5Cl]Cl_2 \rightarrow 1:2$

$[Co(NH_3)_4Cl_2]Cl \rightarrow 1:1$

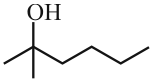
$[Co(NH_3)_3Cl_3] \rightarrow 0$

Q.80 **(2)**



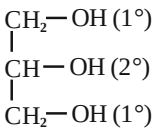
(phosgene gas)

Q.81 (4)

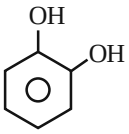


2-methyl hexan-2-ol is an 3°-Alcohol give immediate turbidity with Lucas reagent.

Q.82 (4)



2, 1° - Alcohol and 1, 2°-Alcohol



Catechol {O-dihydroxy benzene

Q.83 (1)

I. $CH_3CH=CH_2 + H_2O \xrightarrow{H^+} CH_3\underset{OH}{\underset{|}{C}}HCH_3$

II. $CH_3CHO \xrightarrow[(ii)H_2O]{(i)CH_3MgI} CH_3\underset{OH}{\underset{|}{C}}HCH_3$

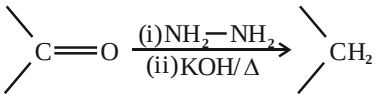
III. $CH_2O \xrightarrow[(ii)H_2O]{(i)C_2H_5MgI} C_2H_5CH_2OH$

IV. $CH_3CH=CH_2 \xrightarrow[neutral]{KMnO_4} CH_3\underset{OH}{\underset{|}{C}}H\underset{OH}{\underset{|}{C}}H_2$

Q.84 (3)

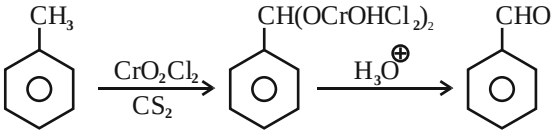
	Acetaldehyde	Acetone
Tollen's test:	✓	×

Q.85 **(2)**



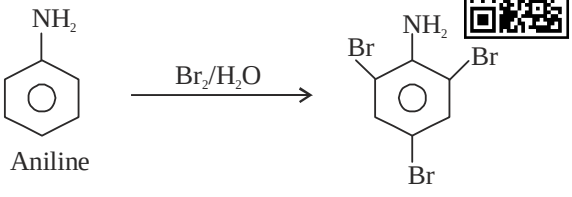
Wolf-Kishner reduction

Q.86 (3)



Toluene — Chromium complex

Q.87 **(4)**



Aniline — 2,4,6- Tribromo aniline

Q.88 **(1)**

For methyl amines, Basic strength order is aqueous medium is

$2^o > 1^o > 3^o > NH_3$

Q.89 **(1)**

Vitamin $B_6 \rightarrow$ Pyridoxine

Vitamin C $\rightarrow$ Ascorbic acid

Vitamin $B_2 \rightarrow$ Riboflavin

Vitamin $B_1 \rightarrow$ Thiamine

Q.90 **(4)**

Kjeldahl method is not applicable to compound containing nitrogen in nitro and azo groups and nitrogen present in the ring (eg, pyridine)

Q.91 (3)

Q.92 (3)

Q.93 (1)

Q.94 (1)

Sphagnum often grows in acidic marshes. The older dead parts of moss and other marshy plants got slowly carbonised, compressed and fossilised over thousands of years and have produced a dark spongy mass called peat.

Q.95 (3)

Q.96 (3)

New NCERT Pg. No. 64

- Statement I: Imbricate aestivation involves overlapping of petals or sepals in a whorl but not in any particular order. When sepals or petals in a whorl just touch one another without overlapping, it is called valvate aestivation, not imbricate.
- Statement II: Correctly describes the vexillary aestivation seen in flowers like those of pea and bean.

Q.97 (3)

Q.98 (4)

Q.99 (1)

Q.100 (4)

Old NCERT Pg. No. 86

The given image is of Sclereid in fruit wall (4).

Q.101 (3)

Q.102 (2)

Q.103 (3)

Q.104 (1)

Q.105 (3)

Q.106 (2)

Q.107 (2)

Q.108 (2)

Q.109 (3)

Q.110 (3)

Q.111 (3)

New NCERT Pg. No. 156

- During glycolysis, two redox equivalents (NADH) are removed from PGAL (glyceraldehyde-3-phosphate), converting it into BPGA (1,3-bisphosphoglycerate).
- Substrate-level phosphorylation involves the direct transfer of a phosphate group to ADP to form ATP, but this is not related to the conversion of PGAL to BPGA.
- Therefore, while both the assertion and reason are true, the reason is not the correct explanation for the assertion.

Q.112 (4)

Q.113 (3)

Q.114 (3)

Q.115 (1)

Q.116 (1)

Q.117 (1)

Q.118 (2)

Q.119 (1)

Q.120 (1)

Q.121 (1)

Q.122 (4)

Q.123 (3)

Q.124 (1)

Q.125 (2)

Q.126 (1)

Q.127 (3)

Q.128 (3)

NEW NCERT Pg. No. - 166

The convention for naming these enzymes is the first letter of the name comes from the genus and the second two letters come from the species of the prokaryotic cell from which they were isolated, e.g., EcoRI comes from Escherichia coli RY13. In EcoRI, the letter 'R' is derived from the name of strain. Roman numbers following the names indicate the order in which the enzymes were isolated from that strain of bacterial

Q.129 (4)

Q.130 (3)

NEW NCERT Pg. No. - 179

the Bt toxin protein exist as inactive proto:ms but once an insect ingest the inactive toxin, it is converted into an active form of toxin due to the alkaline pH of the gut which solubilise the crystals. The activated toxin binds to the surface of midgut epithelial cells and create pores that cause cell swelling and lysis and eventually cause death of the insect.

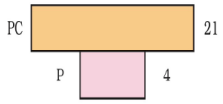
Q.131 (3)

Q.132 (2)

Q.133 (4)

Q.134 (2)

NEW NCERT Pg. No. - 212



(c) Inverted pyramid of biomass-small standing crop of phytoplankton supports large standing crop of zooplankton

Q.135 (4)

Q.136 (1)

Q.137 (4)

NEW NCERT Pg. No - 223

Causes of biodiversity losses: The accelerated rates of species extinctions that the world is facing now are largely due to human activities. There are four major causes 'The Evil Quartet' etc.

(i) Habitat loss and fragmentation
(ii) Over-exploitation
(iii) Alien species invasions
(iv) Co-extinctions

Q.138 (3)

Q.139 (4)

Q.140 (4)

NEW NCERT Pg. No. - 49

Here the psittacula means parrot , comes under aves of animal

kingdom are homiothermous (warm blooded animals) i.e , they are able to maintain a constant body temperature.

Q.141 (4)

NEW NCERT Pg. No. - 40

Here both the statements A AND B are correct

A- depicting the water canal system of poriferans , where water enters through ostia and exit through osculum → this is correct

B - poriferans are dioecious sexes are separate

Q.142 (3)

Q.143 (2)

Q.144 (4)

New NCERT Pg. No. 80, 81

- Statement I: Incorrect, as adult frogs have a short alimentary canal because they are carnivorous, not herbivorous.
- Statement II: Incorrect, as the dorsal side of a frog is typically olive green with dark spots.

Q.145 (3)

Q146 (3)

Q.147 (4)

Q.148 (2)

Q.149 (4)

Q.150 (2)

Q.151 **(4)**

Chloroplast duplication occurs in G_2 phase of the cell cycle.

Q.152 **(3)**

NEW NCERT Pg. No. - 185

Breathing involves two stages : inspiration during which atmospheric air is drawn in and expiration by which the alveolar air is released out.

Expiration takes place when the intra-pulmonary pressure is higher than the atmospheric pressure.

Relaxation of the diaphragm and the inter-costal muscles returns the diaphragm and sternum to their normal positions and reduce the thoracic volume and thereby the pulmonary volume. This leads to an increase in intra-pulmonary pressure to slightly above the atmospheric pressure causing the expulsion of air from the lungs, i.e., expiration

Q.153 (4)

NEW NCERT Pg. No. - 187

Residual Volume (RV): Volume of air remaining in the lungs even after a forcible expiration. This averages 1100 mL to 1200 mL. By adding up a few respiratory volumes described above, one can derive various pulmonary capacities, which can be used in clinical diagnosis.

Q.154 (3)

Q.155 (4)

NEW NCERT Pg. No -198 , 199

A bicuspid or mitral valve guards the opening between the left atrium and the left ventricle. The openings of the right and the left ventricles into the pulmonary artery and the aorta respectively are provided with the semilunar valves.

The opening between the right atrium and the right ventricle is guarded by a valve formed of three muscular flaps or cusps, the tricuspid valve,

Q.156 (3)

Q.157 (4)

Q.158 (1)

Q.159 (4)

Q.160 (3)

Q.161 (2)

NEW NCERT Pg. No. -232

When a neuron is not conducting any impulse, i.e., resting, the axonal membrane is comparatively more permeable to potassium ions (K^+) and nearly impermeable to sodium ions (Na^+). Similarly, the

membrane is impermeable to negatively charged proteins present in the axoplasm. Consequently, the axoplasm inside the axon contains high concentration of K^+ and negatively charged proteins and low concentration of Na^+.

Q.162 (3)

Q.163 (2)

Q.164 (2)

Q.165 (3)

Q.166 (3)

NEW NCERT Pg. No - 27

The epididymis leads to vas deference that ascends to the abdomen and loops over the urinary bladder. It recieves a duct from seminal vesicle and opens into urethra as the ejaculatory duct.

Q.167 (4)

NEW NCERT Pg. No - 37

Placenta also acts as an endocrive tissue and produces several hormones like HCG (human chorionic gonadotrophin), HPL (human placental lactogen), estrogens, pregestogens etc.

Q.168 (3)

NEW NCERT Pg. No. -48

Infertility cases either due to inability of the male partner to inseminate the female or due to very low sperm counts in the ejaculates, could be corrected by artificial insemination (AI) technique. In this technique, the semen collected either from the husband or a healthy donor is artificially introduced either into the vagina or into the uterus (IUI – intra-uterine insemination) of the female.

Q.169 (4)

NEW NCERT Pg. No. -47

Early symptoms of most of these are minor and include itching, fluid discharge, slight pain, swellings, etc., in the genital region. Infected females may often be asymptomatic and hence, may remain undetected for long. Absence or less significant symptoms in the early stages of infection and the social stigma attached to the STIs, deter the infected persons from going for timely detection and proper treatment.

Q.170 (3)

Q.171 (4)

Q.172 (4)

Q.173 (3)

NEW NCERT Pg. No. -88

(a) RNA was the first genetic material: Correct. Evidence supports that RNA evolved before DNA.

(c) Ribosome is the protein-synthesizing factory: Correct. Ribosomes are essential for translation.

(d) Lac operon regulation by a common promoter and regulatory genes: Correct. This is the mechanism of polycistronic genes in prokaryotes.

(b) is incorrect because RNA polymerase binds to the promoter (not start codon).

Q.174 (1)

NEW NCERT Pg. No -117

The process of evolution of different species in a given geographical area starting from a point and literally radiating to other areas of geography (habitats) is called adaptive radiation, Darwin's finches represent one of the best examples of this phenomenon.

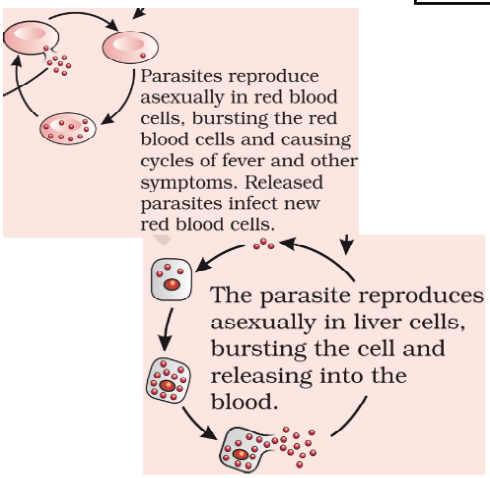
Q.175 (3)

NEW NCERT Pg. No - 124

About 15 mya, primates called Dryopithecus and Ramapithecus were existing. They were hairy and walked like gorillas and chimpanzes. Ramapithecus was more man like while Dryopithecus was more ape-like. The first human like being the hominid and was called Homo habilis. The brain capacities were between 650-800 cc. They probably did not eat meat. Homo sapiens arose in Africa and moved across continents and developed into distinct races.

Q.176 (3)

Q.177 (2)
NEW NCERT Pg. No -132



Q.178 (3)
NEW NCERT Pg. No -137

The exaggerated response of the immune system to certain antigens present in the environment is called allergy. The substances to which such an immune response is produced are called allergenates. Common examples of allergens are mites in dust, pollens, animal dander, etc. Symptoms of allergic reactions include sneezing, watery eyes, running nose and difficulty in breathing.

For determining the cause of allergy, the patient is exposed to or injected with very small doses of possible allergens, and the reactions studied. The use of drugs like anti-histamine, adrenalin and steroids quickly reduce the symptoms of allergy.

Somehow, modern-day life style has resulted in lowering of immunity and more sensitivity to allergens.

Q.179 (1)
NEW NCERT Pg. No -134

For diseases such as malaria and filariasis that are transmitted through insect vectors, the most important measure is to control or eliminate the vectors and their breeding places. The vector-borne (Aedes mosquitoes) diseases are dengue and chikungunya.

Q.180 (4)