ANSWER KEY
FULL TEST-10

PHYSICS

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

CHEMISTRY

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

BIOLOGY

Q.91 (1)	**Q.92** (1)	**Q.93** (4)	**Q.94** (3)	**Q.95** (3)	**Q.96** (2)	**Q.97** (4)	**Q.98** (3)	**Q.99** (2)	**Q.100** (2)
Q.101 (4)	**Q.102** (3)	**Q.103** (3)	**Q.104** (1)	**Q.105** (1)	**Q.106** (1)	**Q.107** (2)	**Q.108** (1)	**Q.109** (3)	**Q.110** (1)
Q.111 (3)	**Q.112** (2)	**Q.113** (3)	**Q.114** (2)	**Q.115** (1)	**Q.116** (1)	**Q.117** (1)	**Q.118** (2)	**Q.119** (1)	**Q.120** (3)
Q.121 (3)	**Q.122** (3)	**Q.123** (3)	**Q.124** (1)	**Q.125** (1)	**Q.126** (1)	**Q.127** (3)	**Q.128** (4)	**Q.129** (4)	**Q.130** (4)
Q.131 (4)	**Q.132** (4)	**Q.133** (3)	**Q.134** (2)	**Q.135** (4)	**Q.136** (4)	**Q.137** (4)	**Q.138** (3)	**Q.139** (2)	**Q.140** 4)
Q.141 (4)	**Q.142** (3)	**Q.143** (3)	**Q.144** (2)	**Q.145** (1)	**Q.146** (2)	**Q.147** (3)	**Q.148** (3)	**Q.149** (2)	**Q.150** (3)
Q.151 (1)	**Q.152** (4)	**Q.153** (3)	**Q.154** (3)	**Q.155** (4)	**Q.156** (2)	**Q.157** (2)	**Q.158** (3)	**Q.159** (1)	**Q.160** (2)
Q.161 (1)	**Q.162** (4)	**Q.163** (3)	**Q.164** (4)	**Q.165** (3)	**Q.166** (4)	**Q.167** (4)	**Q.168** (1)	**Q.169** (1)	**Q.170** (1)
Q.171 (2)	**Q.172** (2)	**Q.173** (2)	**Q.174** (1)	**Q.175** (3)	**Q.176** (2)	**Q.177** (4)	**Q.178** (1)	**Q.179** (2)	**Q.180** (2)

HINTS & SOLUTION

Q.1 (2)

(1) [Force] = $[M^1L^1T^{-2}]$, surface tension = $[M^1L^0T^{-2}]$

(2) [Frequency] = $[T^{-1}]$, velocity gradient

$$= \frac{dv}{d\ell} = \frac{L^1T^{-1}}{L^1} = \left[T^{-1}\right]$$

both are having same dimension

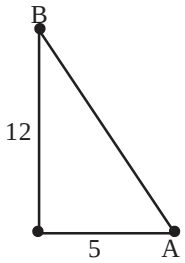
(3) $[\omega] = \left[\frac{\theta}{t}\right] = \left[T^{-1}\right]$, solid angle = dimensionless

(4) stefan's constant,

$$\sigma = \frac{dQ/dt}{AT^4} = \frac{\left[M^1L^2T^{-3}\right]}{\left[L^2K^4\right]} = \left[M^1L^0T^{-3}K^{-4}\right]$$

Planck's constant, $h = \frac{E}{\nu} = \frac{\left[M^1L^2T^{-2}\right]}{\left[T^{-1}\right]} = \left[M^1L^2T^{-1}\right]$

Q.2 (3)



AB = Displacement $= \sqrt{12^2 + 5^2} = 13\text{cm}$

Q.3 (3)

Option A is incorrect. If the velocity is zero at an instant, then acceleration may not necessarily be zero at that instant.

For e.g. when an object is thrown vertically upward, at the highest point the velocity is zero but acceleration on it due to gravity is non-zero.

Option B is incorrect because if the velocity and acceleration are in opposite direction then the object will slow down.

Option C is incorrect because if the position and velocity have opposite sign the particle will move towards origin.

Q.4 (1)

Q.5 (4)

Loss in potential energy = Gain in kinetic energy

$mgh = \frac{1}{2}mv^2$

$v = \sqrt{2gh}$

$\therefore$ Speed is independent of angle of projection.

Q.6 (3)

Concept of Inertia.

Q.7 (3)

work done by friction force = mgh

$= \frac{1}{1000} \times 10 \times 10 \quad = \frac{1}{10} \quad = 0.1\ J$

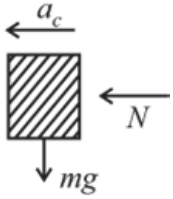
Q.8 (2)

Using conservation of energy between point P and point B

$\Rightarrow mg \times \frac{7R}{2} = \frac{1}{2}mv^2 + mgR$

$\Rightarrow v = \sqrt{5gR}$

Now at Point B



$N = \frac{mv^2}{R} \quad = \frac{m \times 5gR}{R} = 5mg$

Q.9 (3)

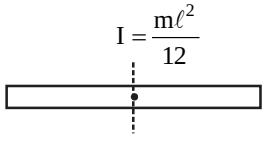
If kinetic energy of a system of particle is zero, means speed of each particle is zero.Therefore, the linear momentum of each particle is zero.

$\therefore$ The linear momentum of system must be zero.

But if linear momentum of system of particle is zero. Then it does not mean that speed of each particle is zero. So the kinetic energy may or may not be zero.

$\vec{P} = \Sigma m_i \vec{v}_i$

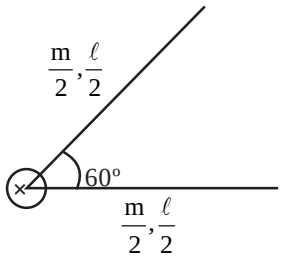
Q.10 (2)



$$I = 2\left[\frac{\left(\frac{m}{2}\right)\left(\frac{\ell}{2}\right)^2}{12} + \frac{m}{2}\left(\frac{\ell}{4}\right)^2\right]$$

$$= \frac{m\ell^2}{48} + \frac{m\ell^2}{16} \quad = \frac{m\ell^2 + m\ell^2}{48} = \frac{m\ell^2}{12}$$

or

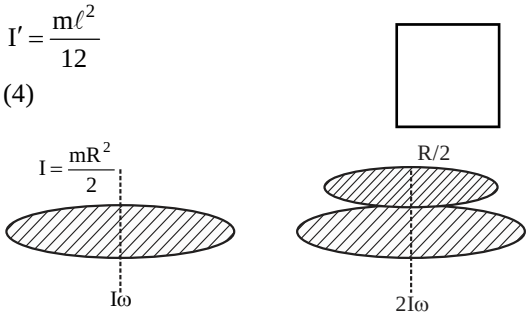


$$I' = \frac{\frac{m}{2}\left(\frac{\ell}{2}\right)^2}{3} + \frac{\left(\frac{m}{2}\right)\left(\frac{\ell}{2}\right)^2}{3}$$

$$I' = \frac{1}{3\times 4}\left[\frac{m\ell^2}{2} + \frac{m\ell^2}{2}\right]$$

$$I' = \frac{m\ell^2}{12}$$

Q.11 (4)



$$I' = \frac{mR^2}{2} + m\left(\frac{R}{2}\right)^2$$

$$= \frac{3mR^2}{4}$$

Angular momentum will remain conserved

$$\frac{mR^2}{2}\omega = \frac{3}{4}mR^2\omega^2 \Rightarrow \omega' = \frac{2\omega}{3}$$

Q.12 (3)

$M_P = 8M_E$

$$\rho_p \frac{4}{3}\pi R_P^3 = 8\rho_E \frac{4}{3}\pi R_E^3$$

$$27\rho_E \frac{4}{3}\pi R_P^3 = 8\rho_E \frac{4}{3}\pi R_E^3$$

$3R_p = 2R_E$

$R_p = \frac{2}{3}R_E$

$g = \frac{GM}{R^2} = \frac{G\rho\frac{4}{3}\pi R^3}{q^3} = \frac{4}{3}G\rho\pi R$

$g \propto \rho R$

$\frac{g'}{g} = \frac{\rho_p' R_p'}{\rho R}$

$\frac{g'}{g} = \frac{(27\rho)\left(\frac{2}{3}R_E\right)}{\rho R_E}$

$g' = 18g$

Q.13 (1)

$X = 0.3\cos\omega t$

$V = \frac{dx}{dt} = -0.3\,\omega\sin\omega t.$

$k.E = \frac{1}{2}mV^2$

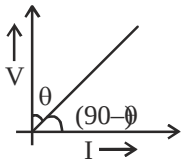
$\frac{k\left(\frac{\pi}{6\omega}\right)}{k\left(\frac{\pi}{3\omega}\right)} = \frac{V_1^2}{V_2^2}$

$= \frac{(0.3\omega)^2\sin^2\omega t_1}{(-0.3\omega)^2\sin^2\omega_2 t_2}$

$= \frac{\sin^2\left(\omega\times\frac{\pi}{6\omega}\right)}{\sin^2\left(\omega\times\frac{\pi}{3\omega}\right)} = \frac{(1/2)^2}{\left(\sqrt{3}/2\right)^2} = \frac{1}{3}$

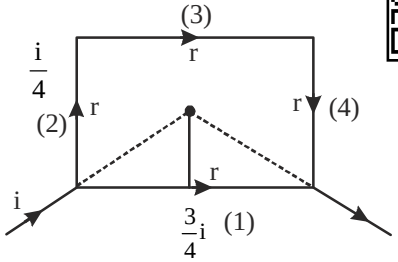
Q.14 (4)

$R = \frac{V}{I} = \tan(90-\theta)$



$R = \cot\theta$

Q.15 (1)



$B = \frac{\mu_0 i}{4\pi r}\left[\sin\theta_1 + \sin\theta_2\right]$

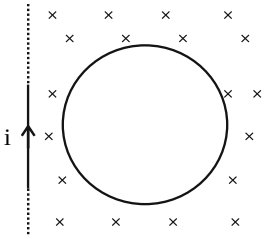
$B_1 = \frac{\mu_0\left(\frac{3}{4}i\right)}{4\pi d}\left[\sin 45^\circ + \sin 45^\circ\right]$

$= \frac{3\sqrt{2}}{4}\frac{\mu_0 i}{4\pi d}\odot = \frac{3\sqrt{2}}{16}\frac{\mu_0 i}{\pi d}\odot$

$B_2 = B_3 = B_4 = \frac{\mu_0\frac{i}{4}}{4\pi(d)}\left[\sin 45^\circ + \sin 45^\circ\right] = \frac{\sqrt{2}\mu_0 i}{16\pi d}\otimes$

$B_c = \vec{B}_1 + \vec{B}_2 + \vec{B}_3 + \vec{B}_4 = \frac{3\sqrt{2}\mu_0 i}{16\pi d} - \frac{3\sqrt{2}\mu_0 i}{16\pi d} = 0$

Q.16 (1)



Magnetic field due to a current carrying infinite wire is

$B = \frac{\mu_0 i}{2\pi r}$

$\therefore i\uparrow, B\uparrow$

$i\downarrow, B\downarrow$

$r\uparrow, B\downarrow$

Magnetic flux, $\phi = BA$

Induced emf, $\varepsilon = -\frac{\partial\phi}{dt}$

So, when current i is decreased magnetic field decreases therefore magnetic flux changes and current induced in the loop in clockwise sense so that change in magnetic field can be opposed.

→ Similarly when current is increased magnetic field will increase and current will flow in anticlockwise direction to oppose the change

→ Similarly $r\uparrow B\downarrow$

$\therefore$ current will flow in clockwise direction to oppose this change

Q.17 (3)

27°

$\frac{dQ}{dt} = \sigma eA\left(T^4 - T_S^4\right)$

$= 5.67\times10^{-8}\times0.4\times200\times10^{-4}(800^4 - 300^4)$

$= 5.67\times0.4\times4015\times2\times10^{-2}$

$= 182$ W Ans. (3)

Q.18 (3)

$p_i v_i = p_f v_f$ (at const. temperature)

(760 mm of Hg) (0.1) = p_f(0.19)

(1 atm = 760 mm of Hg)

p_f = 400mm of Hg

= 40 cm of Hg

Ans. (3)

Q.19 (3)

Concave mirror forms real as well as virtual image, for real image, magnification is negative for virtual image, magnification is positive.

Q.20 (4)

Q = – 20J, w = –8J, U_i = 30 J, U_f = ?

Q = ΔU + w (first law of thermodynamics)

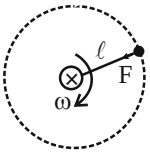
– 20 = (U_f – 30) – 8

U_f = 30 – 12

= 18 J

Q.21 (1)

$$\text{Stress} = \frac{F}{A} = 4.8\times10^7\ \text{N/m}^2$$



$F = 4.8 \times 10^7 \times 10^{-6} = 48$ N

$m\omega^2\ell = 48$

$$\omega^2 = \frac{48}{0.3\times10}$$

$\omega^2 = 16 \Rightarrow \omega = 4$ rad/s

Q.22 (2)

$Q_4 + 10 + 5 – 8 = 0$

$Q_4 = 7\ m^3/s$

$\therefore\ 0.5\ v = 7$

$$v = \frac{7}{0.5}\frac{70}{5} = 14\,m/s$$

Q.23 (2)

$$h = \frac{2T\cos0°}{R\rho g}$$

Q.24 (3)

The magnitude of the surface tension of a liquid depends on the attractive forces between the molecules. When the attractive forces are large, the surface tension is large. An increase in temperature increases the kinetic energy of the molecules, and the effectiveness of intermolecular attraction decreases. So, the surface tension decreases as the temperature is raised.

Q.25 (3)

$$\frac{\sigma_1}{\sigma_2} = \frac{R_2}{R_1} = \frac{3R}{R} = 3$$

Ans. (3)

Q.26 (3)

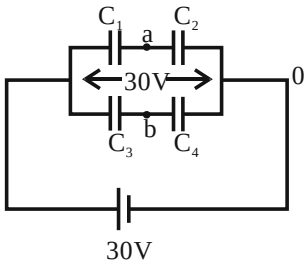
$\phi_{net} = \phi_{entering} + \phi_{exiting}$

$$= -\frac{15}{\varepsilon_0\ell^2}\ell^2 + \frac{5}{\varepsilon_0\ell^2}\times\ell^2 = -\frac{10}{\varepsilon_0} = \frac{q_{in}}{\varepsilon_0}$$

$\therefore\ q_{in} = –10C$

Ans. (3)

Q.27 (4)



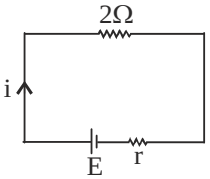
30V

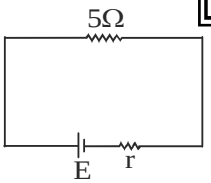
$$V_a - 0 = \frac{C_1}{C_1 + C_2}V = \left(\frac{1}{1+1.5}\right)\times30 = \frac{30}{2.5} = 12V$$

$$V_b - 0 = \frac{C_3}{C_3 + C_4}V = \frac{2.5}{2.5+0.5}\times30 = 25V$$

$V_b – V_a$ = 12 – 25 = 13V

Q.28 (3)





$$i = \frac{\varepsilon}{2+r} = 0.5$$

$2\varepsilon = 2 + r$ ...(i)

$$i = \frac{\varepsilon}{5+r} = 0.25 = \frac{1}{4}$$

$4\varepsilon = 5 + r$

Putting value of 2ε from equaiton (i)

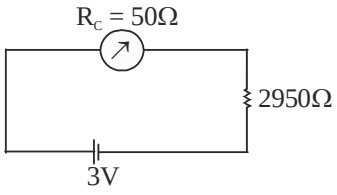
2(2 + r) = 5 + r

from equation (i)

$$\varepsilon = \frac{2+1}{2} = \frac{3}{2} = 1.5V$$

r = 1Ω

Q.29 (3)



$$i = \frac{\varepsilon}{R_{eq}}$$

$$i = \frac{30}{2950+50}$$

$$i = \frac{3}{3000} = 1\text{ nA}$$

Current corresponding to 30 division = 1nA

Current corresponding to 1 division = $\frac{1}{30}$ nA

Current corresponding to 20 division = $\frac{20}{30} = \frac{2}{3}$ nA

For current in the circuit to between $\frac{2}{3}$ mA, additional resistance needed is

$$i = \frac{\varepsilon}{R_{eq}+R}$$

$$\frac{2}{3}\times 10^{-3} = \frac{3}{3000+R}$$

$3000 + R = 4500$

$R = 1500\ \Omega$

$\therefore$ Total resistance = 2950 + 1500 = 4450 Ω

Q.30 (1)

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

Rate of change of linear momentum = force

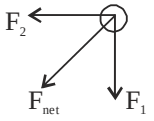
force is maximum when

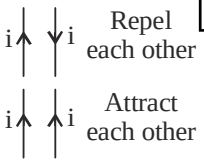
$\sin\theta = 1$

$\theta = 90°$

$\therefore \vec{V} \perp \vec{B}$

Q.31 (3)





Direction of net force is along C.

Q.32 (2)

$$\text{Induced emf.}|e| = \frac{d\phi}{dt} = \frac{d(BA)}{dt}$$

$$= A\frac{dB}{dt} = \pi\left(\frac{14}{100}\right)^2 \times 0.05$$

= 3.08 mV

Q.33 (1)

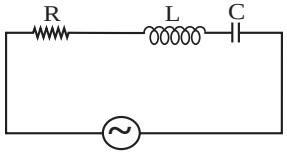
In case of resonance $X_L = X_C$. So, the circuit becomes purely resistive circuit and in pure resistive circuit current and voltage are in same phase.

Current in case of resonance

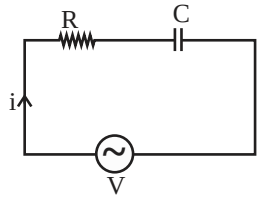
$i = \frac{V_{rms}}{R}$, depends only on resistance.

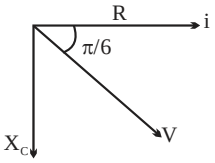
$\therefore$ statement I is correct while statement II is incorrect.

Q.34 (3)



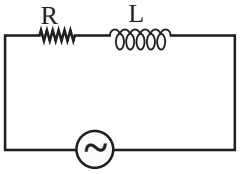
L is removed

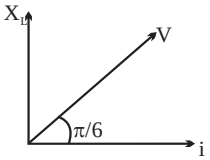




$$\tan\frac{\pi}{6} = \frac{X_C}{R} \quad \text{.....(i)}$$

C is removed





$$\tan\frac{\pi}{6} = \frac{X_L}{R} \quad \text{.....(ii)}$$

from eq. (i) and (ii)

$X_L = X_C$

$\therefore \quad Z = \sqrt{R^2 + (X_L - X_C)^2} = R$

power factor, $\cos\phi = \frac{R}{Z} = \frac{R}{R} = 1$

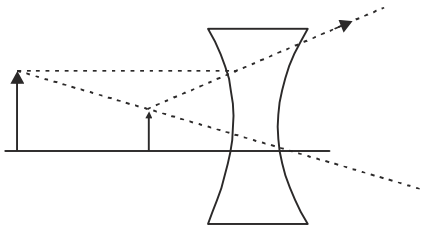
Q.35 (3)

$\tan\theta = \mu$

$\tan\theta = \frac{4}{3}$ | or $\sin\theta = \frac{4}{5}$

$\theta = \tan^{-1}\left(\frac{4}{3}\right)$ | $\theta = \sin^{-1}\left(\frac{4}{5}\right)$

Q.36 (4)



Q.37 (3)

$$y = 5\beta = \frac{5\lambda_1 D}{d} = 6\,mm \qquad \text{..... (i)}$$

$$y' = n\beta' = \frac{n\lambda_2 D}{d} \qquad \text{.....(ii)}$$

From equation (i)

$$\frac{D}{d} = \frac{6\,mm}{5\lambda_1} = \frac{(6\,mm)}{5(600\,nm)}$$

$$y' = 3\beta' = \frac{3\lambda_2 D}{d}$$

$$= 3\times(400\,nm)\times\frac{6\,mm}{5(600\,nm)}$$

$$= \frac{12}{5} = 2.4\,mm \quad \textbf{Ans.}$$

Q.38 (1)

f = hn

v = 5n

Stopping potential $V_S = X$

$eV_S = h\nu - \phi$

$eX = h(5n) - hn$

$eX = 4hn$ ... (1)

If surface is illuminated with frequency in

$eV_S = h\nu - \phi$

$eV_S = 7\,hn - hn = 6hn$

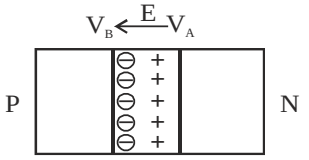
$$eV_S = 6\left(\frac{eX}{4}\right)$$

$$V_S = \frac{3}{2}X$$

Q.39 (4)

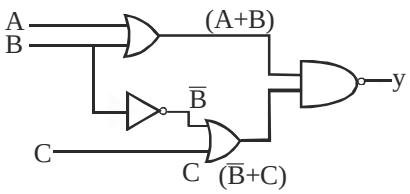
$${}_zX^4 \xrightarrow{4\alpha} {}_{z-8}Y^{A-16} \xrightarrow{3\beta} {}_{z-8+3}W^{A-16} = {}_{z-5}W^{A-16}$$

Q.40 (2)



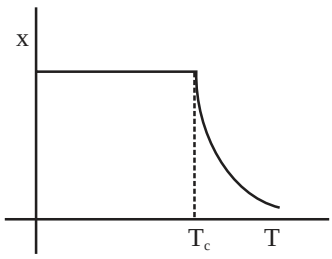
$V_A > V_B$

Q.41 (2)



$$y = (A+B)(\overline{B}+C)$$

Q.42 (1)



When ferromagnetic substance heated above curie temperature, it behaves like a paramagnetic material.

Q.43 (2)

For diamagnetic material

$x<0$, $\mu_r<1$, $\varepsilon_r>1$

$\therefore \varepsilon_r = 1.5$, $\mu_r = 0.5$

Q.44 (2)

$$\text{Least count} = \frac{\text{Pitch}}{N} = \frac{0.5}{50} = 0.01\ mm$$

Q.45 (2)

Area $= \ell \times b$

$A = 1 \times 0.5 = 0.5\ m^2$

$$\frac{\Delta A}{A} = \frac{\Delta \ell}{\ell} + \frac{\Delta b}{b}$$

$$\frac{\Delta A}{A} = \frac{0.01}{1} + \frac{0.01}{0.50}$$

$\Delta A = (0.01 + 0.02)\,A$

$= (0.03)\,(0.5)$

$= 0.01\ m^2$

$A = (0.5 \pm 0.01)\,m^2$

Q.46 (3)

	weight	mole	mole ratio
C	24	$\frac{24}{12} = 2$	$2/2 = 1$
H	4	$\frac{4}{1} = 4$	$\frac{4}{2} = 2$
O	64	$\frac{64}{16} = 4$	$\frac{4}{2} = 4$

E.F. = CH_2O_2

Q.47 (2)

Lyman series second line transition is $(n_2 \rightarrow n_1)\ 3 \rightarrow 1$

$$\frac{1}{\lambda} = R \times z^2\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

$$\frac{1}{\lambda} = R \times (1)^2\left(\frac{1}{1} - \frac{1}{9}\right)$$

$$\frac{1}{\lambda} = \frac{8R}{9}$$

$$\lambda = \frac{9}{8R}$$

Q.48 (2)

Hund's rule : Degenerate orbitals of a subshell are firstly half filled with parallel spin electron then pairing will start.

Eg. p^4 : $\boxed{\uparrow\downarrow}\boxed{\uparrow}\boxed{\uparrow}$

Q.49 (2)

Halogens have high electron gain enthalpy in periodic table after that chalcogen and pnicogen family .

Cl > F > S > P

Q.50 (3)

Atomic size order $\rightarrow$ F < N < O < C

On moving Left to Right in a period atomic size dereases.

Q.51 (4)

	dipole moment
NH_3	1.47 D
NF_3	0.23D
BF_3	0 D

Q.52 (3)

In BCl_3 and BeF_2 Hybridistion occurs in first excited state .

$B \rightarrow 1s^2\ 2s^2\ 2p^1$

$B^+ \rightarrow 1s^2\ 2s^1\ 2p^2$

$Be \rightarrow 1s^2\ 2s^2$

$Be^+ \rightarrow 1s^2\ 2s^1\ 2p^1$

Q.53 (3)

	B.O.
C_2^-	2.5
C_2	2
C_2^+	1.5

Q.54 (2)

$X \rightarrow Y + X$

$S_X = 120$ J/k-mole

$S_y = 213.8$ J/k-mole

$S_z = 197.9$ J/k-mole

$\Delta S_{rx}^{\ n} = S_{product} - S_{reactant}$

$= [S_y + S_z] - [S_x]$

$= (213.8 + 197.9) (120)$

$\Delta S_{rx}^{\ n} = 291.7$ J/k-mol

Q.55 (4)

q = 100 J

$W = -P_{ext}.(dV)$

$= -1.5 (2 - 8)$

$= 9\ \ell$. atm

$9U = q + w$

$\Delta U = 100\ J + 9 \times 101.3$

$\Delta U = 100 + 911.7$

$\Delta U = 1011.7$

Q.56 (4)

$\Delta H = Ea_f - Ea_b$

So activation energy E_a can be greater than less than or equal to ΔH option (4)

Q.57 (1)

$P^H = 4.75 + \log \frac{0.2}{0.1}$

$P^H = 4.75 + 0.30$

$P^H = 5.05 = -\log [H^+]$

$[H^+] = 10^{-5.05}$

$[H^+] = 9 \times 10^{-6}$

Q.58 (4)

$N_2 + 3H_2 \rightleftharpoons 2NH_3 + Heat$

It is a exothermic reaction $\Delta H < 0$

(i) When $[NH_3]\uparrow$ es. Reaction goes in backward direction.

(ii) P$\downarrow$es reaction goes in the direction where no of moles is more so back direction.

(iii) $[N_2]$ & $[H_2]$ decreases so reaction goes in backward direction

(iv) Vol.$\downarrow$es reaction goes in that direction where no of moles is less & $\Delta H < 0$

So, T$\downarrow$ es Rx^n goes in forward direction

Q.59 (2)

$P^H = 2$ & $P^H = 3$ so resulting solution is also acidic.

$$[H^+] = \frac{10^{-2} \times V + 10^{-3} \times V}{2V}$$

$$[H^+] = \frac{11 \times 10^{-3}}{2} = 5.5 \times 10^{-3}$$

$P^H = -\log 5.5 \times 10^{-3}$

$= 3 - \log 5.5$

$= 3 - 0.74$

$= 2.26$

Q.60 (2)

$$\overset{+7}{M}nO_4^- + \overset{+3}{N}O_2^- \rightarrow \overset{+5}{N}O_3^- + Mn^{+2}$$

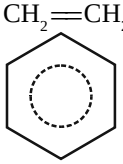
equivalent of MnO_4^- = equivalent. of NO_2^-

$1 \times 5 =$ mole $\times 2$

$$\text{mole} = \frac{5}{2}$$

Q.61 (3)

$CH_3 — CH_3$ $\quad$ $CH_2 = CH_2$



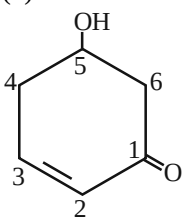
$CH \equiv CH$

$C — C$ $\quad$ $C = C$

$C \equiv C$ $\quad$ $C \cdots C$

Bond length $\rightarrow$ I > IV > II > III

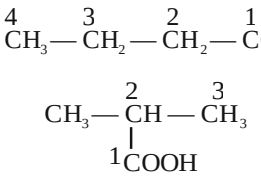
Q.62 (4)



$>C = O \rightarrow$ ketone $\rightarrow$ PFG

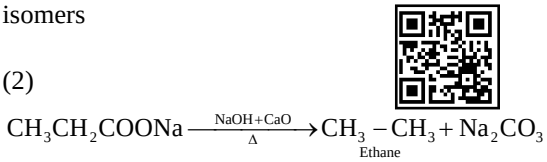
Lowest set of locant for PFG then MB then substituent

Q.63 (1)



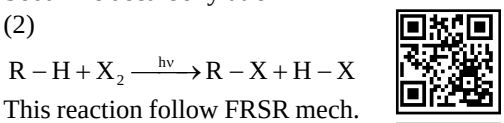
Same MF, Same F.G. but different size of Pcc so chain isomers

Q.64 (2)



Sodalime decarboxylation

Q.65 (2)



This reaction follow FRSR mech.

Q.66 (3)

Benzsene is an nucleophile so its characterist reactions are electrophilic substitution.

Q.67 (2)

$\Delta T_f = i \times k_f \times m$

$T^0_f - T_f = i \times k_f \times m$

$0.1 = i \times 1.86 \times 0.04$

$$i = \frac{0.1}{1.86 \times 0.04} = 1.34$$

$1.34 = 1 + \alpha$

$\alpha = 0.34$

Q.68 (4)

$\Delta T_b = K_b \times m$

$$1 = 2.53 \times \frac{100}{Mwt} \times \frac{1000}{100}$$

$$Mwt = 2.53 \times 1000 = 2530\ g/mol$$

option (4)

Q.69 (3)

$A^+ \longrightarrow A$ 0.08

$B^+ \longrightarrow B$ – 2.93

$C^+ \longrightarrow C$ – 2.01

for reducing power

$A \rightarrow A^+$ –0.08

$B \rightarrow B^+$ +2.93

$C \rightarrow C^+$ +2.01

B > C > A

Q.70 (3)

$A_2B_3 \rightarrow 2A^{+3} + 3B^{2-}$

$n_f = 6$

$\lambda_m = \lambda_{eq} \times n_f$

$\lambda_m = 6 \times \lambda_{eq}$

Q.71 (4)

Q.72 (2)

H_2O has exceptionally highest bioling point due to strong inter moleular H- Bonding

Q.73 (2)

$Xe[PtF_6]$ was the first Xe compund found by N. Bartlett in his experiment .

Q.74 (4)

Magnetic moment depends upon the number of unpaired electron.

d^3: 3 Unpaired electron

d^2: 2 Unpaired electron

d^8: 2 Unpaired electron

d^6: 4 Unpaired electron

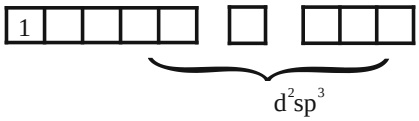
Q.75 (2)

When we move left to Right in a period atomic / ionic radii decreases .

$Yb^{3+} < Pm^{3+} < Ce^{3+} < La^{3+}$

Q.76 (3)

$[Ti(H_2O)_6]^{+3}$, $Ti^{+3} \longrightarrow 3d^1$



due to prsence of one unpaired e^- it is paramagnetic . and coloured compound

Q.77 (3)

Primary valency = oxidation no. of central metal ion.

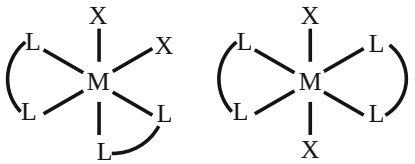
$x + 5H_2O + 1(-1) = +2$

$x + 5(0) - 1 = +2$

$x = +3$

Q.78 (1)

$[MX_2(L-L)_2]$ Shows optical isomerism



Cis Trans

Q.79 (3)

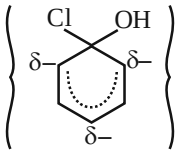
S_N2 reaction is faster for 1° alkyl halides.

Q.80 (3)

Reactivity of different $\propto$ stability of $C^{\oplus}$ alcohol with HX 3° > 2° > 1° - Alcohols

Q.81 (3)

Intermediate of NSR of aryl halide is carbanion

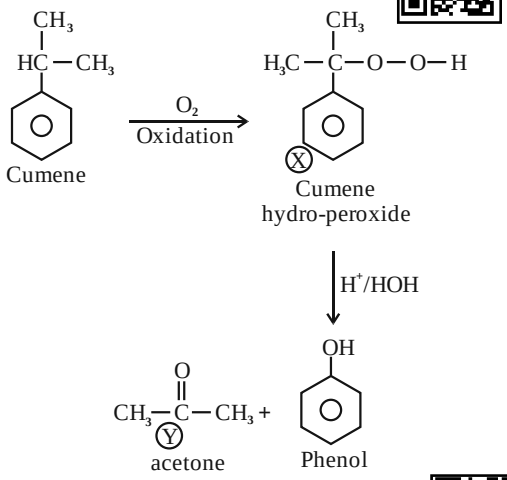


so EWG ($-NO_2$)

at O, P increases stability of carbanion so reactivity of aryl halide also increases and less temp is required for the reaction.

A → q B → r c → p

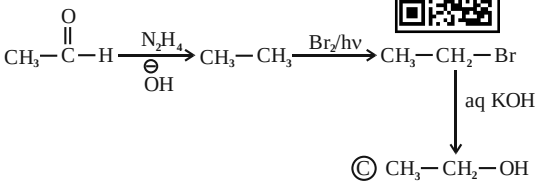
Q.82 (3)



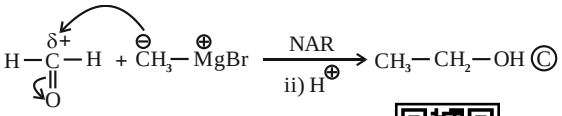
Q.83 (1)

Both assertion and reason are correct and correctly explain.

Q.84 (4)



$$CH_3 - CH_2 - OH \xrightarrow{I_2 + NaOH} \underset{\text{yellow}}{CHI_3}\downarrow + HCOONa$$



Q.85 (4)

Q.86 (4)

(a) Gattermann koch → CO, HCl, Anhy $AlCl_3$

(b) Rosenmund reduction → H_2, Pd – $BaSO_4$

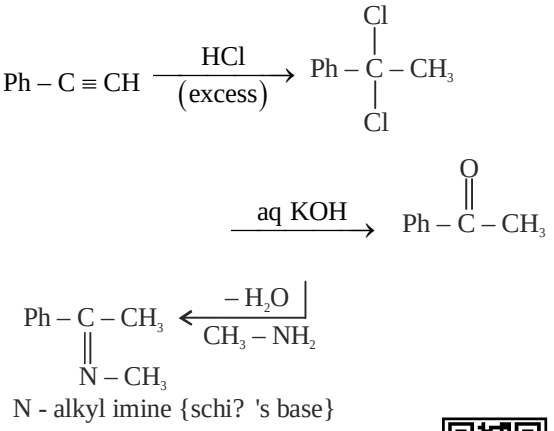
(c) Stephen - Reduction → $SnCl_2$ + HCl, $H_3O^{\oplus}$

(d) Etard reaction → $CrO_2Cl_2 - CS_2$, $H_3O^{\oplus}$

Q.87 (2)

Simple aliphatic carboxylic acids having upto four carbon atoms are miscible with water.

Q.88 (4)



N - alkyl imine {schi? 's base}

Q.89 (4)

Denaturation of protein can be brought about by changing pH and T.

Q.90 (3)

$Pb^{2+} + 2Cl^- \longrightarrow PbCl_2\downarrow$ (soluble in hot water) ; $PbCl_2 + CrO_4^{2-} \longrightarrow PbCrO_4\downarrow$ (yellow) + $2Cl^-$.

Q.91 (1)

Q.92 (1)

Q.93 (4)

Flagellated protozoans are either free living or parasitic. The parasitic forms cause diseases such as sleeping sickness e.g., *Trypanosoma*

Q.94 (3)

Q.95 (3)

Spirogyra - Green alga
Cycas - Gymnosperm
Selaginella - Pteridophyte
Sphagnum-Moss

Q.96 (2)

Q.97 (4)

Q.98 (3)

Q.99 (2)

Q.100 (2)

Q.101 (4)

Q.102 (3)

Q.103 (3)

Q.104 (1)

Q.105 (1)

Q.106 (1)

Q.107 (2)

Q.108 (1)

Q.109 (3)

Q.110 (1)

Q.111 (3)

Q.112 (2)

Q.113 (3)

Q.114 (2)

Q.115 (1)

Q.116 (1)

Q.117 (1)

Q.118 (2)

Elephants and humans are not plant pollinators.

Q.119 (1)

Q.120 (3)

NEW NCERT Pg. No -18

The other male gamete moves towards the two polar nuclei located in the central cell and fuses with them to produce a triploid primary endosperm nucleus (PEN).

Q.121 (3)

Q.122 (3)

Q.123 (3)

Q.124 (1)

Q.125 (1)

Q.126 (1)

Q.127 (3)

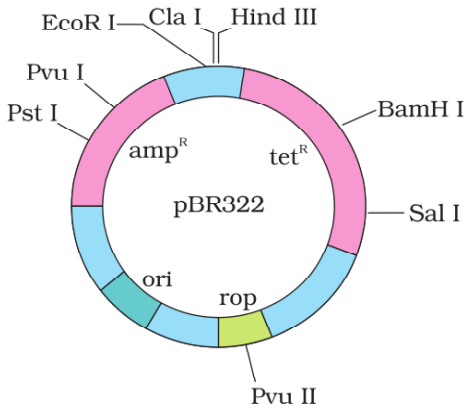
Q.128 (4)

NEW NCERT Pg. No -154, 155

The greater the BOD of waste water, more is its polluting potential.

Q.129 (4)

NEW NCERT Pg. No. - 169



If we ligate a foreign DNA at the BamH I site of tetracycline resistance gene in the vector pBR322. The recombinant plasmids will lose tetracycline resistance due to insertion of foreign DNA.

Q.130 (4)

NEW NCERT Pg. No. - 184

Transgenic mice are being developed for use in testing the safety of vaccines before they are used on humans. Transgenic mice are being used to test the safety of the polio vaccine.

Chemical safety testing: This is known as toxicity/ safety testing. The procedure is the same as that used for testing toxicity of drugs. Transgenic animals are made that carry genes which make them more sensitive to toxic substances than non-transgenic animals.

Q.131 (4)

NEW NCERT Pg. No. - 180

Using Agrobacterium vectors, nematode-specific genes were introduced into the host plant.

Q.132 (4)

Q.133 (3)

Q.134 (2)

NEW NCERT Pg. No. - 206

Vertical distribution of different species occupying different levels is called stratification. For example, trees occupy top vertical strata or layer of a forest, shrubs the second and herbs and grasses occupy the bottom layers.

Q.135 (4)

Q.136 (4)

Q.137 (4)

NEW NCERT Pg. No - 221

Some examples of recent extinctions include the dodo (Mauritius), quagga (Africa), thylacine (Australia), Steller's Sea Cow (Russia) and three subspecies (Bali, Javan, Caspian) of tiger. The last twenty years alone have witnessed the disappearance of 27 species.

Q.138 (3)

Q.139 (2)

NEW NCERT Pg. No. - 42

Planaria posses high regeneration capacity and flame cells for osmoregulation and excretion

Q.140 4)

NEW NCERT Pg. No. - 40

Here *Euspongia* option does not goes with the other options

Q.141 (4)

NEW NCERT Pg. No. - 45

Balanoglossus is a worm like invertebrate, exhibits branchial respiration and dioecious in nature (sexes are separate)

Q.142 (3)

NEW NCERT Pg. No. - 43

In this hookworm , filarial worm and round worm all three are the members of aschelminthes With pseudocoelom and muscular pharynx

Q.143 (3)

Q.144 (2)

Q.145 (1)

Q.146 (2)

Q.147 (3)

Q.148 (3)

Q.149 (2)

Q.150 (3)

Q.151 (1)

Bivalent and tetrad number is same.

Q.152 (4)

NEW NCERT Pg. No. - 190

Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking.

Q.153 (3)

NEW NCERT Pg. No -195

Platelets also called thrombocytes, are cell fragments produced from megakaryocytes (special cells in the bone marrow). Blood normally contains 1,500,00-3,500,00 platelets mm^{-3}.

Q.154 (3)

NEW NCERT Pg. No -203

Heart Failure: Heart failure means the state of heart when it is not pumping blood effectively enough to meet the needs of the body. It is sometimes called congestive heart failure because congestion of the lungs is one of the main symptoms of this disease.

Q.155 (4)

NEW NCERT Pg. No. - 209

PCT is lined by simple cuboidal brush border epithelium which increases the surface area for reabsorption.

Q.156 (2)

Q.157 (2)

Q.158 (3)

Q.159 (1)

NEW NCERT Pg. No - 247

The atrial wall of our heart secretes a very important peptide hormone called atrial natriuretic factor (ANF), which decreases blood pressure.

Q.160 (2)

Q.161 (1)

NEW NCERT Pg. No - 38

Parturition is induced by a complex neuroendocrine mechanism. The signals for parturition originate from the fully developed foetus and the placenta which induce mild uterine contractions called foetal ejection reflex.

Q.162 (4)

NEW NCERT Pg. No - 31

Some of the spermatogonia called primary spermatocytes periodically undergo meiosis.

Q.163 (3)

NEW NCERT Pg. No - 35

Fertilisation can only occur if the ovum and sperms are transported simultaneously to the ampullary region.

Q.164 (4)

Q.165 (3)

Test tube baby technique includes IVF (invitro fertilization)

But GIFT technique involves invivo fertilization

Q.166 (4)

NEW NCERT Pg. No. - 44

In barrier methods, ovum and sperms are prevented from physically meeting with the help of barriers. Such' methods are available for both males and females. Condoms

Q.167 (4)

Q.168 (1)

Q.169 (1)

Q.170 (1)

Q.171 (2)

NEW NCERT Pg. No -121

Five factors are known to affect Hardy-Weinberg equilibrium.

These are gene migration or gene flow, genetic drift, mutation, genetic recombination and natural selection. Men migration of a section of population to another place and population occurs, gene frequencies change in the original as well as in the new population. New genes/alleles are added to the new population and these are lost from the old population.

Q.172 (2)

NEW NCERT Pg. No - 122

By the time of 500 mya, invertebrates were formed and active. Jawless hsh probably evolved around 350 mya. Sea weeds and few plants existed probably around 320 mya. We are told that the first organisms that invaded land were plants. They were widespread on land when animals invaded land. Fish with stout and strong fins could move on land and go back to water. This was about 350 mya.

Q.173 (2)

Q.174 (1)

NEW NCERT Pg. No -141

MRI uses strong magnetic fields and non-ionising radiations to accurately detect pathological and physiological changes in the living tissue.

Q.175 (3)

NEW NCERT Pg. No -136

When a host is exposed to antigens, which may be in the form of living or dead microbes or other proteins, antibodies are produced in the host body. This type of immunity is called *active immunity*. Active immunity is slow and takes time to give its full effective response.

When ready-made antibodies are directly given to protect the body against foreign agents, it is called *passive immunity*.

The yellowish fluid *colostrum* secreted by mother during the initial days of lactation has abundant antibodies (IgA) to protect the infant. The foetus also receives some antibodies from their mother, through the placenta during pregnancy. These are some examples of passive immunity.

Q.176 (2)

NEW NCERT Pg. No -131

Plasmodium, a tiny protozoan is responsible for malaria.

Different species of Plasmodium (*P. vivax*, *P. malaria* and *P. falciparum*) are responsible for different types of malaria. Of these, malignant malaria caused by *Plasmodium falciparum* is the most serious one and can even fatal.

The parasite reproduces asexually in liver cells, bursting the cell and releasing into the blood.

Q.177 (4)

NEW NCERT Pg. No -143

The flower tops, leaves and the resin of cannabis plant are used in various combinations to produce marijuna, hashish, charas and ganja.

Q.178 (1)

Q.179 (2)

Q.180 (2)