

1
ANSWER KEY
MAJOR TEST (XI)

PHYSICS

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

CHEMISTRY

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

BIOLOGY

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

Q.1 (1)

$$\frac{\Delta p}{p} \times 100 = \frac{1}{2} \left(\frac{\Delta a}{a} + \frac{\Delta b}{b} + \frac{\Delta c}{c} \right) \times 100 + \frac{\alpha \Delta d}{d} \times 100$$

$$\Rightarrow 2 = \frac{1}{2} \left(\frac{1}{2} + \frac{1}{2} + \frac{1}{2} \right) + \alpha \left(\frac{1}{2} \right)$$

$$\Rightarrow 2 = \frac{3}{4} + \frac{\alpha}{2} \Rightarrow \frac{\alpha}{2} = 2 - \frac{3}{4} = \frac{5}{4} \Rightarrow \alpha = \frac{5}{2}$$



Q.2 (2)

Average speed, $V_{\text{avg}} = \frac{\text{Total distance travelled}}{\text{total time taken}}$

Area of velocity – time gives displacement

Distance travelled = $|\vec{S}_{0 \text{ to } 40\text{s}}| + |\vec{S}_{40 \text{ to } 80\text{s}}|$

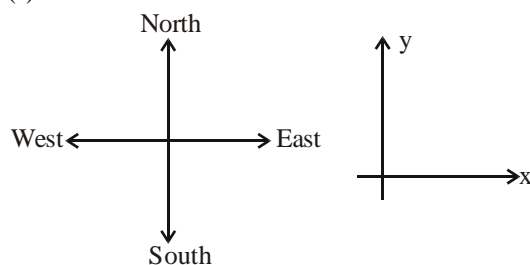
$$= \frac{1}{2} \times 40 \times 10 + \frac{1}{2} \times 40 \times 10$$

$$= 200\text{m} + 200\text{m} = 400\text{m}$$

$$V_{\text{avg}} = \frac{400}{80} = 5\text{ m/s}$$



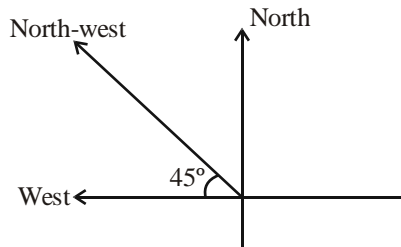
Q.3 (1)



$$\vec{V}_A = 30 \frac{\text{km}}{\text{h}} \hat{i} \quad \vec{V}_B = 30 \frac{\text{km}}{\text{h}} \hat{j}$$



$$\vec{V}_{B/A} = \vec{V}_B - \vec{V}_A = 30(\hat{j} - \hat{i}) \frac{\text{km}}{\text{h}}$$



$$|\vec{V}_{B/A}| = 30\sqrt{2} = 42 \frac{\text{km}}{\text{h}}$$

Q.4 (3)

Work done by variable force, $WD = \int_{x_i}^{x_f} fdx$

$$\Rightarrow WD = \int_0^1 (20 + 20x) dx$$

$$= \left(20x + \frac{20x^2}{2} \right)_0^1 = 20 + 10 = 30 \text{ J}$$



Q.5 (1)

Distance of masses

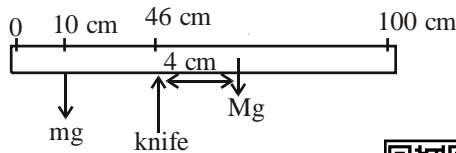
$$\text{from x-axis} = \sqrt{y^2 + z^2}$$

Moment of inertia, $I = m_1r_1^2 + m_2r_2^2 + m_3r_3^2 + m_4r_4^2$

$$\Rightarrow I = (1)(0) + (2)(0) + (3)(3)^2 + (4)(2)^2 = 27 + 16 = 43 \text{ kg m}^2$$



Q.6 (3)



Balancing torque about knife

$$(mg)(36) = mg(4)$$

$$\Rightarrow M = 9m = (9 \times 8) \text{ gram} = 72 \text{ g}$$



Q.7 (2)

$$F - T = 2a \text{ and } T = 1(a) = a$$

$$\therefore a = \frac{F}{3} = \frac{10}{3} \text{ m/s}^2$$



$$\text{and } T = \frac{10}{3} \text{ N}; \text{ Stress} = \frac{T}{\pi r^2} = \frac{6.25}{3\pi} \times 10^9$$

$$r = 4 \times 10^{-5} \text{ m}$$

Q.8 (1)

$$Q = Av$$

$$A_1v_1 = A_2v_2$$

$$\frac{v_1}{v_2} = \frac{A_2}{A_1} = \frac{\frac{\pi}{4}d_2^2}{\frac{\pi}{4}d_1^2}$$

$$\frac{v_1}{v_2} = \frac{9}{4}$$



2

Q.9

$$\begin{aligned} (1) \quad W &= S \times 8\pi R^2 \\ &= 4.8 \times 10^{-2} \times 8 \times 3.14 \times (4 \times 10^{-2})^2 \\ &= 1929.216 \times 10^{-6} \text{ J} \\ &= 19.29 \times 10^{-4} \text{ J} \end{aligned}$$



Q.10

(3) Heat flow, $\Delta Q = mS\Delta T$
where S = specific heat capacity

$$\Rightarrow S = \frac{\Delta Q}{m\Delta T} \left(\frac{\text{J}}{\text{kg-K}} \right)$$

Specific heat capacity remains constant for small temperature variations. But for large temperature variation, it varies with temperature.



Q.11

(2) Work done by gas in expansion is positive. Work done by gas in compression is negative. From graph, we can conclude that volume is decreasing \Rightarrow compression \Rightarrow negative workdone



Q.12

(2) Both the gases will occupy volume equal to volume of container.

$$PV = nRT \Rightarrow \frac{P_1}{P_2} = \frac{n_1}{n_2} = \frac{5}{3}$$



Q.13

$$(1) \quad T = 2\pi \sqrt{\frac{\ell}{g}} = 4 \text{ s}$$

Given $g = \pi^2$

$$4 = 2\pi \sqrt{\frac{\ell}{\pi^2}}; \quad 2 = \sqrt{\ell}; \quad \ell = 4 \text{ m}$$



Q.14

$$(4) \quad \text{L.C.} = \frac{\text{Pitch}}{\text{Number of division on circular scale}}$$

$$\Rightarrow 0.01 \text{ mm} = \frac{\text{Pitch}}{50} \Rightarrow \text{Pitch} = 0.5 \text{ mm}$$



Q.15

(1) average speed $\langle \vec{v} \rangle = \frac{\text{displacement}}{\text{time}}$

$$= \frac{ut + \frac{1}{2}at^2}{t} = u + \frac{1}{2}at$$



Q.16 (2)

Horizontal range

$$= \frac{2u_x \cdot u_y}{g} = \frac{2 \times 6 \times 8}{10} = \frac{48}{5}$$

R = 9.6 metre



Q.17 (1)

$$t_{\min} = \frac{12}{4} = 3 \text{ sec}$$



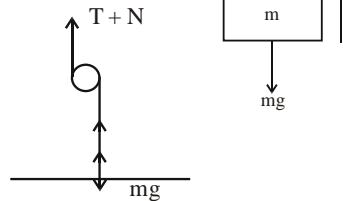
Q.18 (1)

Acceleration of block = 0 m/s²

$$\Rightarrow T - mg = ma = 0$$

$$\Rightarrow T = mg = 200 \text{ N}$$

F.B.D of man



As man is at rest

$$\Rightarrow T + N = mg \Rightarrow 200 + N = 600 \times 10 \Rightarrow N = 400$$



Q.19 (4)

Equilibrium position means F = 0

⇒ Possible points are A and C for unstable equilibrium, if particle is displaced from mean position, force and displacement is in same direction

⇒ Point C



Q.20 (2)

Force required to pump

$$\text{water} = V \frac{dm}{dt} = \rho A v^2$$

where ρ = density of water

A = cross-sectional area

v = speed of flow

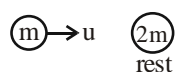
$$\text{Power} = \vec{F} \cdot \vec{V} = \rho A v^3 = \left(\frac{\text{mass}}{\text{volume}} \right) (\text{area}) v^3$$

$$= \left(\frac{\text{mass}}{\text{length}} \right) v^3 = 50 \times (4)^3 = 50 \times 64 = 3200 \text{ W}$$

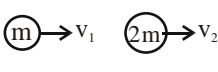


Q.21 (1)

Before collision



After collision



From momentum conservation.

$$mu + 0 = mv_1 + 2mv_2$$

$$\Rightarrow u = v_1 + 2v_2 \dots (1)$$

$$\text{From } e = \frac{v_2 - v_1}{u_1 - u_2} \Rightarrow 1 = \frac{v_2 - v_1}{u - 0}$$

$$\Rightarrow v_2 - v_1 = u \dots (2)$$

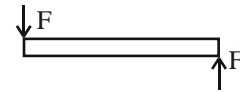
Solving (1) and (2), we get

$$v_2 = \frac{2u}{3} \text{ and } v_1 = -\frac{u}{3}$$



Q.22 (2)

When equal and opposite forces act on a body at two different points then it is called as couple



$$F_{\text{net}} = F - F = \text{zero}$$

⇒ No linear motion

but torque about any point

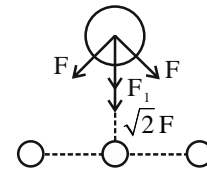
is $\neq 0$

⇒ torque $\neq 0$

⇒ there will be rotational motion



Q.23 (2)



$$F_1 = \frac{Gmm}{d^2}; F = \frac{Gmm}{(\sqrt{2}a)^2}$$

$$\vec{F}_{\text{net}} = F_1 + \sqrt{2}F = \frac{Gmm}{d^2} + \frac{1}{\sqrt{2}} \frac{mm}{a^2}$$

$$= \frac{Gmm}{d^2} (1 + 1/\sqrt{2}) \text{ along PB}$$



Q.24 (3)

Slope of stress vs strain graph gives modulus of elasticity (young's modulus).

$$\text{Young's modulus for B, } Y_B = \tan 60^\circ = \sqrt{3}$$

$$\text{Young's modulus for A, } Y_A = \tan 30^\circ = \frac{1}{\sqrt{3}}$$

$$\Rightarrow \frac{Y_B}{Y_A} = \frac{\sqrt{3}}{\frac{1}{\sqrt{3}}} = \frac{3}{1}$$



Q.25 (3)

$$P_{\text{excess}} = \frac{4T}{r} \text{ and } V \propto r^3$$

$$V_1 : V_2 = 8 : 1 \Rightarrow r_1 : r_2 = 2 : 1$$

$$P_{\text{excess}} \propto \frac{1}{r}$$



Q.26 (3)

Bernoulli's theorem is energy conservation in liquid flow where sum of pressure energy, kinetic energy and gravitational potential energy remains constant.

$$\text{ie } P + \rho gh + \frac{1}{2} \rho v^2 = \text{energy per unit volume} \\ = \text{constant}$$



Q.27 (1)

$$\frac{\Delta V}{V} = \gamma \Delta T \Rightarrow \frac{0.12}{100} = (3\alpha) \times 20$$

$$\Rightarrow \alpha = \frac{0.12}{100 \times 60} = 2 \times 10^{-5} \text{C}^{-1}$$



Q.28 (3)

In cyclic process; $dU = 0$

$$Q_1 + Q_2 + Q_3 + Q_4 = W_1 + W_2 + W_3 + W_4$$

$$\text{Hence } W_4 = 765 \text{ J}$$



Q.29 (4)

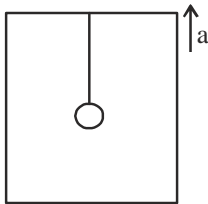
Use, $TV^{\gamma-1} = \text{constant}$

$$\Rightarrow \frac{T_2}{300} = (8)^{\frac{5}{3}-1}$$

$$T_2 = 1200 \text{ K} = 927^\circ \text{C}$$



Q.30 (2)



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

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

$$\frac{T^2}{4} = 4\pi^2 \frac{\ell}{a+g}$$

$$\frac{4\pi^2 \ell}{4g} = 4\pi^2 \frac{\ell}{a+g}$$

$$a + g = 4g \Rightarrow a = 3g$$



Q.31 (4)

Comparing from standard equation,
 $y = A \sin(\omega t - kx)$

$$\omega = \frac{2\pi}{0.04}, k = \frac{2\pi}{50}$$

$$\text{and } k = \frac{2\pi}{\lambda}$$

$$\Rightarrow \lambda = 50 \text{ cm}$$



Q.32 (1)

$$[\text{Energy}] = [\text{ML}^2\text{T}^{-2}]$$

$$[\text{Speed}] = [\text{LT}^{-1}]$$

$$[\text{Energy} \times \text{speed}] = [\text{ML}^3\text{T}^{-3}]$$

$$\Rightarrow a = 1, b = 3, c = -3$$



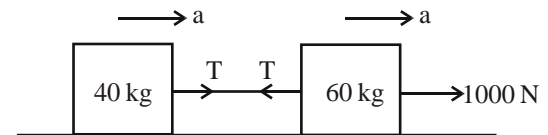
Q.33 (2)

$$\underbrace{0.0000}_{5} \underbrace{5041}_{4}$$

In significant 4 significant digits

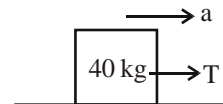


Q.34 (2)



$$a = \frac{1000}{40 + 60} = 10 \text{ m/s}^2$$

For 40 kg block :-



$$T = ma = 40a$$

$$= 40 \times 10 = 400 \text{ N}$$



Q.35 (1)

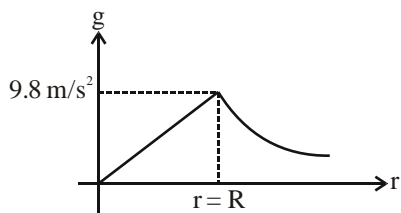
$$\vec{r}_{\text{cm}} = \frac{m_1 \vec{r}_1 + m_2 \vec{r}_2 + m_3 \vec{r}_3 + m_4 \vec{r}_4}{m_1 + m_2 + m_3 + m_4}$$

$$\Rightarrow X_{\text{cm}} = \frac{m_1 x_1 + m_2 x_2 + m_3 x_3 + m_4 x_4}{m_1 + m_2 + m_3 + m_4}$$

$$\Rightarrow X_{\text{cm}} = \frac{m(1) + 2m(0) + 3m(-1) + 4m(0)}{m + 2m + 3m + 4m}$$

$$\Rightarrow X_{\text{cm}} = \frac{m - 3m}{10m} = -\frac{1}{5}$$





where $R =$ radius of earth

$$g_{\text{mine}} < g_{\text{sea-level}} > g_{\text{mountain}}$$

$$\Rightarrow W_{\text{mine}} < W_{\text{sea-level}} > W_{\text{mountain}}$$

Q.46

(3)
No. of molecules

$$(\text{oxygen}) = \frac{16}{32} \times N_A = \frac{1}{2} N_A$$

$$\text{In } 14\text{g } N_2, \text{ no. of molecules} = \frac{14}{28} \times N_A = \frac{1}{2} N_A$$

Q.47

(1)
 $m_{e^-} : m_{p^+} : m_{n^0}$

$$9.1 \times 10^{-31} : 1.6726 \times 10^{-27} : 1.675 \times 10^{-27}$$

$$\frac{9.11 \times 10^{-31}}{9.11 \times 10^{-31}} : \frac{1.673 \times 10^{-27}}{9.11 \times 10^{-31}} : \frac{1.6749 \times 10^{-27}}{9.11 \times 10^{-31}}$$

$$1 : 1836 : 1839$$

Q.48

(4)
Given $\Delta x = 0$
Uncertainty in momentum (ΔP) = ?

$$\Delta x \cdot \Delta P \geq \frac{h}{4\pi} ; \Delta P \geq \frac{h}{4\pi \times \Delta x} ; \Delta P \geq \frac{h}{4\pi \times 0}$$

$\Delta P =$ infinite

Q.49

(4)
When we move left to right in a period atomic radii decreases and when we move top to bottom in a group atomic radii increases.

$$N > O$$

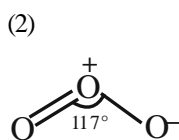
$$\wedge \quad \wedge$$

$$P > S$$

Q.50

(1)
Ununium ($Z = 111$) it is Rontgenium (Rg) not darmstadtium.

Q.51

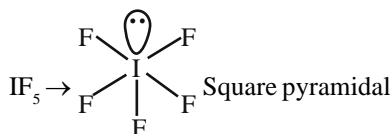
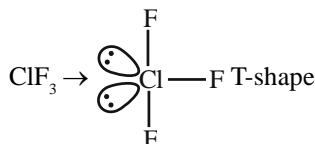
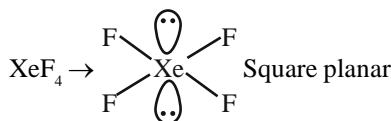
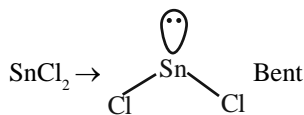


Ozone molecule contain $2\sigma, 1\pi$ bond

6

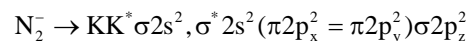
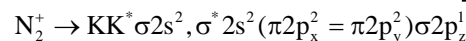
Q.52

(3)



Q.53

(1)



$$(\pi^* 2p_x^1 = \pi^* 2p_y^1)$$

N_2^+ is more stable than N_2^- because in N_2^+ number of e⁻s in ABMO is less than N_2^- .

Q.54

(2)

At 100°C and 1 atm pressure conversion of $H_2O(l)$ into $H_2O(g)$ will be at equilibrium.

At equilibrium,

$$\Delta S_{\text{universe}} = 0$$

$$\Delta S_{\text{system}} + \Delta S_{\text{surrounding}} = 0$$

Since ΔS_{system} is positive as liquid is converted into gas, So $\Delta S_{\text{surrounding}}$ will be negative.

$$\Delta S_{\text{system}} > 0 \text{ and } \Delta S_{\text{surrounding}} < 0$$

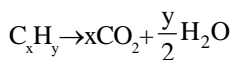
Q.55

(4)

Melting of ice is an endothermic process, so ΔH is positive.

Q.56

(4)



$$0.5L \quad 2.5L \quad 3L$$

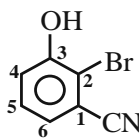
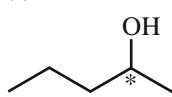
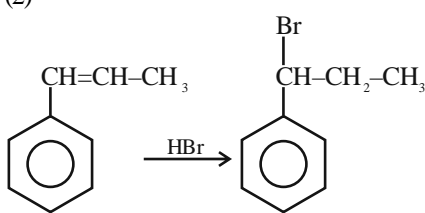
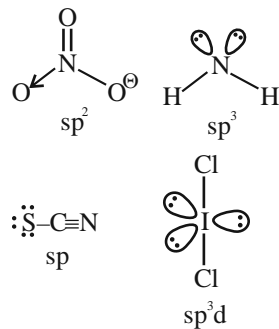
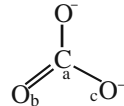
$$x = \frac{2.5}{0.5} = 5$$

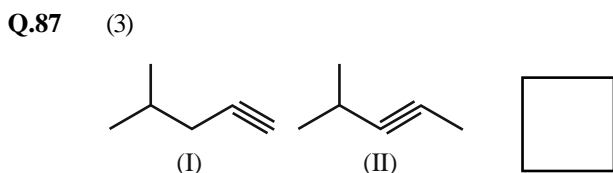
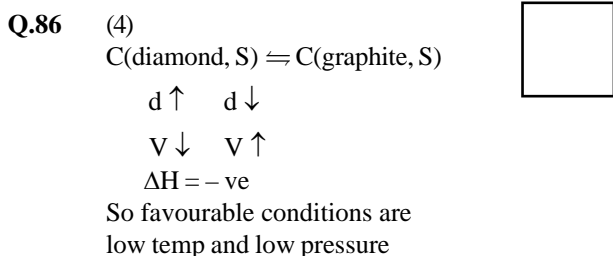
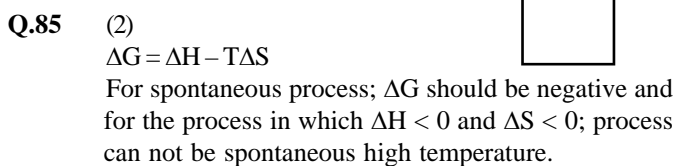
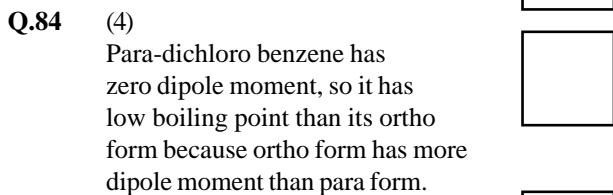
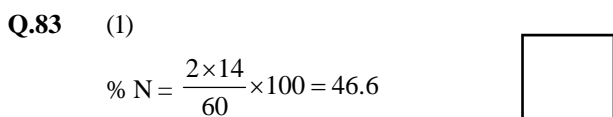
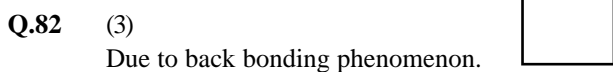
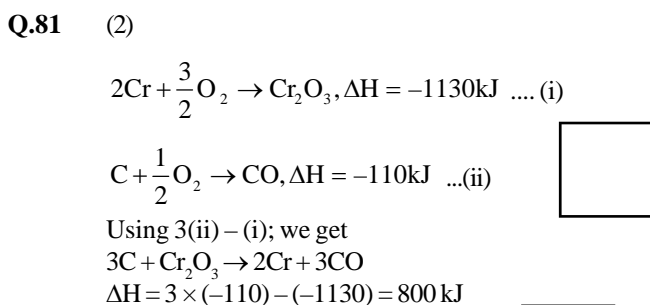
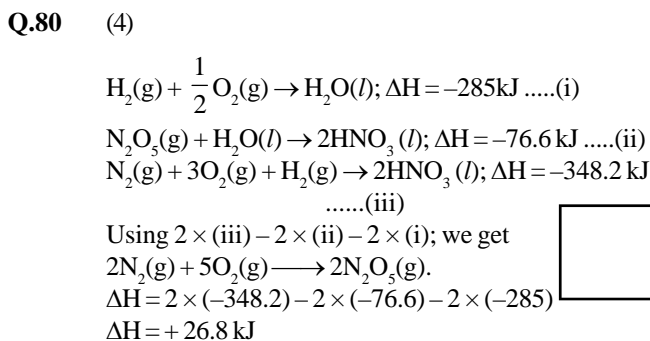
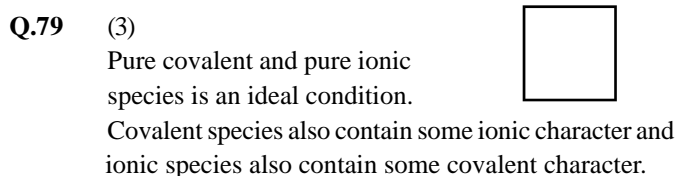
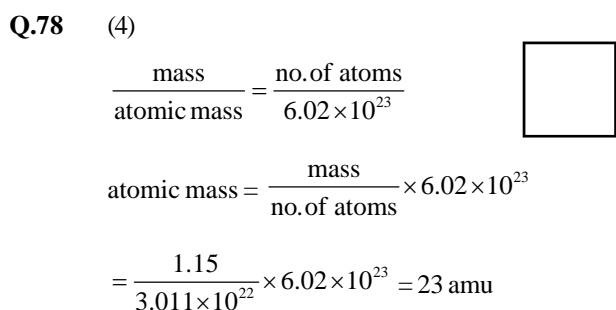
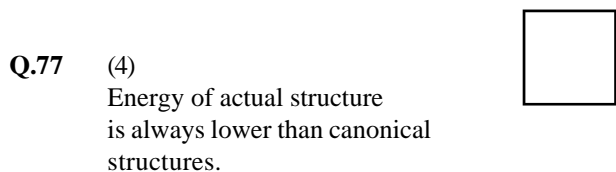
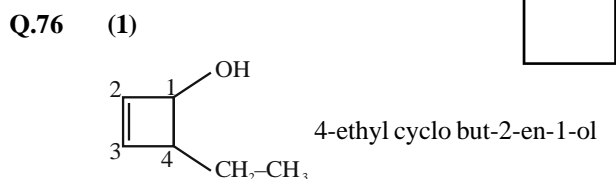
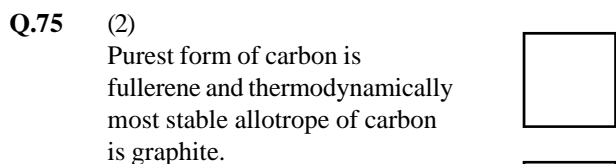
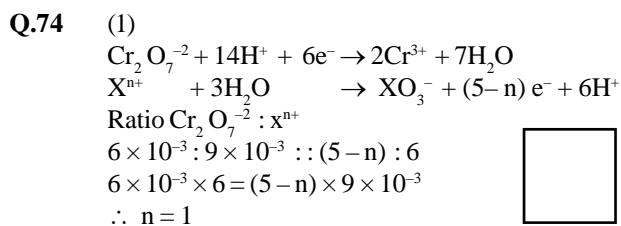
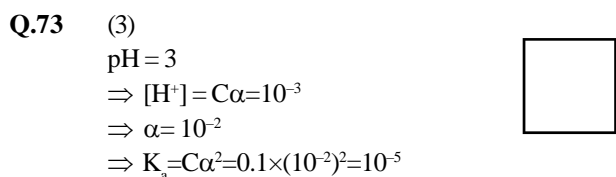
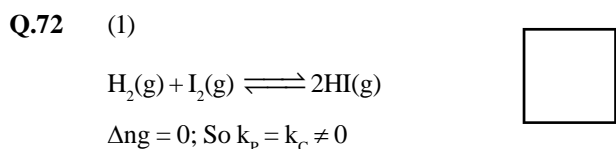
$$\frac{y}{2} = \frac{3}{0.5} \Rightarrow y = 12 [C_5H_{12}]$$

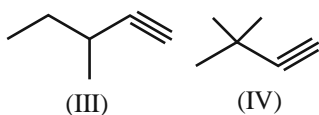


- Q.57** (2)

$$\text{pH} = \text{pK}_a + \log \frac{[\text{Salt}]}{[\text{Acid}]}; 4 = 5 + \log \frac{[\text{Salt}]}{[\text{Acid}]}$$

$$\frac{[\text{Salt}]}{[\text{Acid}]} = 10^{-1}$$
- Q.58** (1)
 In CH_4 , oxidation state of C is -4 which is the lowest possible oxidation state of carbon, so it can act as reducing agent only.
- Q.59** (1)
 Due to inert pair effect Pb^{+2} is more stable than Pb^{+4} . So PbO_2 behave as oxidising agent.
- Q.60** (3)

 2-bromo-3-hydroxy benzonitrile
- Q.61** (2)

 2-pentanol contains only one chiral carbon, So it will be optically active (chiral).
- Q.62** (1)
 Electron rich groups act as *ortho* and *para* directing groups as they increases electron density at these two positions.
 Out of the given groups, following are electron rich and deficient,
 Electron rich — OH , $-\text{OCH}_3$, $-\text{NHCOCH}_3$
 Electron deficient — CN , $-\text{CO}_2\text{H}$, $-\text{CHO}$
 Hence, $-\text{OH}$, $-\text{OCH}_3$ and $-\text{NHCOCH}_3$ acts as *ortho* and *para*-directing groups towards electrophilic substitution reactions.
- Q.63** (2)

- Q.64** (4)
 Number of significant figures in 2.0400 is 5.
- Q.65** (1)
 $E_2 - E_1 > E_3 - E_2 > E_4 - E_3 > E_5 - E_4$
- Q.66** (2)
 According to $(n + \ell)$ rule, lower value of $(n + \ell)$ orbitals are filled 1st, which is not followed in (2)
- Q.67** (1)
 I.E. order $\rightarrow \text{N} > \text{Be} > \text{B} > \text{Li}$
- Q.68** (2)
 Sn and Pb form amphoteric oxides.
- Q.69** (1)

- Q.70** (1)

 $a = 0, b = 0, c = -1$
- Q.71** (3)
 (a) On cooling, entropy decrease
 (b) $\text{CaCO}_3(\text{s}) \rightarrow \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
 $\Delta n_g > 0$; So entropy \uparrow
 (c) $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$
 $\Delta n_g < 0$; So entropy \downarrow
 (d) $\text{HCl}(\text{g}) + \text{NH}_3(\text{g}) \rightarrow \text{NH}_4\text{Cl}(\text{s})$
 $\Delta n_g < 0$; So entropy \downarrow
 (e) $\text{Cl}_2(\text{g}) \rightarrow 2\text{Cl}(\text{g})$
 $\Delta n_g > 0$; So entropy \uparrow
 (f) $\text{H}_2\text{O}(\text{s}) \rightarrow \text{H}_2\text{O}(\ell)$
 When ice melts, entropy \uparrow
 (g) Rusting of iron, entropy \downarrow
 (h) On crystallisation, entropy \downarrow
 (i) On boiling egg, entropy \uparrow
 (j) $\text{N}_2(\text{g})_{(10 \text{ atm})} \rightarrow \text{N}_2(\text{g})_{(1 \text{ atm})}$
 Gas of less pressure has more entropy, so entropy \uparrow



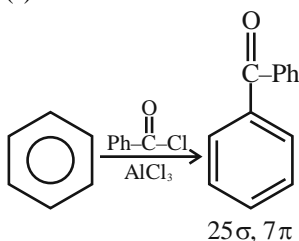


Q.88 (3)

$$\text{Stability of carbanions} \propto \frac{-I}{+I}$$

$$\text{Stability order } \overset{\ominus}{\text{C}}\text{H}_2\text{CH}_3 < \overset{\ominus}{\text{C}}\text{H}_3 < \overset{\ominus}{\text{C}}\text{H}_2\text{CHO} < \overset{\ominus}{\text{C}}\text{H}_2\text{NO}_2$$

Q.89 (3)



Q.90 (3)

Theory based

Q.91 (3)

New NCERT Pg. No. 4, 5, Class XI

- Biological names are latinised or derived from Latin to ensure universal understanding.
- Dogs, mammals, and animals represent different taxonomic levels such as species, class, and kingdom respectively.

Q.92 (3)

New NCERT Pg. No. 13, 16, 18, Class XI

Statements a, c, d, and e are correct. Mycoplasma does not have a cell wall, making statement b incorrect.

Q.93 (3)

NEW NCERT Pg. No. 74, 75, Class XI

- Dicot roots typically have small and inconspicuous pith, while other pairs mentioned are incorrect.
- Monocot roots have radial, exarch condition.
- Monocot stem have conjoint endarch vascular bundles.
- Dicot stem have conjoint endarch vascular bundles arranged in form of a ring.

Q.94 (1)

Hydrogen ions produced by water splitting accumulate in the stroma of chloroplast

New NCERT Pg. No. 140, 141, Class XI

According to the chemiosmotic hypothesis, hydrogen ions accumulate in the thylakoid lumen, not in the stroma.

Q.95 (2)

New NCERT Pg. No. 125, Class XI

Mitosis is primarily for growth, repair, and regeneration, not for introducing genetic variations.

Q.96 (4)

New NCERT Pg. No. 69, Class XI

Brinjal flowers are actinomorphic, hypogynous with valvate aestivation in both calyx and corolla.

Q.97 (3)

New NCERT Pg. No. 65, Class XI

Argemone does not exhibit free central placentation; it has parietal placentation.

Q.98 (4)

New NCERT Pg. No. 108, Class XI

Codeine is an alkaloid, a secondary metabolite derived from the opium poppy plant. It is used for its analgesic properties.

Q.99 (4)

New NCERT Page No. 88, 98

Here both the statements are incorrect.

I. Prokaryotic ribosomes are 70S has two subunit 50S and 30S eukaryotic ribosome are 80S has two subunits 40S and 60S.

II. Within the cell, ribosomes are found not only in the cytoplasm but also within the two organelles, chloroplast (in plants) and mitochondria and rough ER.

Q.100 (2)

New NCERT Pg. No. 106, Class XI

Tyrosine, phenylalanine and tryptophan are aromatic amino acids, whereas valine, glutamic acid, glycine, and serine are not.

Q.101 (1)

New NCERT Pg. No. 75, Class XI

Dicot stems typically have a starch sheath (i) and vascular bundles arranged in a ring (iii). Presence of sclerenchymatous hypodermis (ii) is characteristic of monocot stems.

Q.102 (3)

New NCERT Pg. No. 121, Class XI

• Interphase (I) is the resting phase of the cell cycle (C).

• S phase (II) is the phase where DNA replication and centriole duplication occurs (A).

- M phase (III) is the most dramatic phase where mitosis or meiosis occurs (B).
- G_1 phase (IV) is the interval between mitosis and DNA replication (D).

Q.103

(1)

New NCERT Pg. No. 139, Class XI

The splitting of water molecules during the photochemical phase of photosynthesis occurs on the lumen side of the thylakoid membrane, releasing oxygen, protons, and electrons.

Q.104

(2)

New NCERT Pg. No. 76, Class XI

In a dorsiventral leaf, the mesophyll is differentiated into palisade and spongy parenchyma. Thus, the statement (2) is incorrect.

Q.105

(1)

New NCERT Pg. No. 65, Class XI

Marginal placentation is seen in pea where the placenta forms a ridge along the ventral suture of the ovary and the ovules are borne on this ridge forming two rows.

Q.106

(1)

New NCERT Pg. No. 176, Class XI

Gibberellin is a plant hormone composed of terpenes and is known to induce stem elongation in rosette plants like cabbage and lettuce.

Q.107

(3)

New NCERT Pg. No. 15, Class XI

Euglenoids do not have a typical cell wall; instead, they have a protein-rich layer called pellicle which makes them flexible.

Q.108

(3)

New NCERT Pg. No. 76, Class XI

Features of Monocot stem.

- Monocot stem has a sclerenchymatous hypodermis.
- Contains many scattered vascular bundles.
- Large, conspicuous parenchymatous ground tissue.
- Vascular bundles are conjoint and closed.
- Peripherical vascular bundles are smaller than central ones.
- Phloem parenchyma is absent.
- Water-containing cavities are present within the vascular bundles.

Q.109

(2)

New NCERT Pg. No. 140, 141, Class XI

Cyclic photophosphorylation occurs in the thylakoid membrane, not in the stroma. The other statements about photophosphorylation are correct.

Q.110

(1)

New NCERT Pg. No. 123, Class XI

The complete disintegration of the nuclear envelope marks the start of metaphase, where chromosomes align at the spindle equator.

Q.111

(1)

New NCERT Pg. No. 64, Class XI

The types of aestivation and their characteristics match as follows: Imbricate (margins overlap but not in any particular direction), Twisted (one margin overlaps the next), Valvate (margins just touch), and Vexillary (large petal overlaps lateral petals).

Q.112

(3)

New NCERT Pg. No. 59, Class XI

A few millimetres above the root cap is the region of meristematic activity. The cells of this region are very small, thin-walled and with dense protoplasm. They divide repeatedly.

Q.113

(3)

New NCERT Pg. No. 116, Class XI

The graph showing the effect of temperature on the velocity of an enzymatic reaction typically follows a bell curve, with enzyme activity increasing to an optimum temperature and then decreasing as the temperature continues to rise.

Q.114

(1)

New NCERT Pg. No. 95, 96, Class XI

Statement A correctly describes the arrangement of Golgi cisternae. However, the cis and trans faces are functionally different but connected via the Golgi cisternae.

Q.115

(3)

New NCERT Pg. No. 24, Class XI

Volvox and *Eudorina* are colonial forms of algae, while *Spirogyra* and *Ulothrix* are filamentous. Algae can reproduce by vegetative, asexual, and sexual methods.

Q.116

(4)

New NCERT Pg. No. 176, 177, Class XI

2,4-D is used to kill dicot weeds, not monocot weeds. The other pairs are correctly matched.

Q.117

(3)

New NCERT Pg. No. 113, Class XI

Inorganic catalysts can work efficiently at high temperatures and pressures, unlike enzymes which are sensitive to such conditions.

6. Anatomy of Flowering Plants

Q.118

(1)

New NCERT Pg. No. 74, 75, Class XI

The given characteristics match a Monocot root (A) and a dicot stem(B). Monocot root have radial vascular

bundles, and dicot stem have a collenchymatous hypodermis.

Q.119

(3)

New NCERT Pg. No. 125, Class XI

After meiosis-II, the resultant daughter cells are haploid with the same amount of DNA as a haploid gamete.

Q.120

(4)

New NCERT Pg. No. 146, Class XI

In C_4 plants, CO_2 fixation by PEP carboxylase occurs in mesophyll cells, and the Calvin cycle operates in bundle sheath cells.

Q.121

(2)

New NCERT Pg. No. 60, 61, Class XI

• B (A flower is a modified shoot) and D (Irregular flower cannot be divided into two similar halves) are correct.

- Flowers with bracts are called bracteate flowers.
- In legumes swollen leaf base is called pulvinus.

Q.122

(2)

New NCERT Pg. No. 177, Class XI

Both statements are true, but the reason provided does not explain the rapid internode/petiole elongation in deep water rice plants.

Q.123

(4)

New NCERT Pg. No. 156, Class XI

Glycolysis does not release carbon dioxide. It produces ATP, NADH + H^+ , and water as by-products of glucose metabolism.

Q.124

(4)

New NCERT Pg. No. 61, Class XI

In racemose inflorescence, the main axis continues to grow, and the flowers are borne in acropetal succession, with younger flowers at the apex and older flowers at the base.

Q.125

(1)

New NCERT Pg. No. 89, Class XI

The structures can be identified as
Red blood cells (A)
White blood cells (B)
Columnar epithelial cells (C)
Mesophyll cells (D)

Q.126

(3)

New NCERT Pg. No. 144, Class XI

In the reduction step of the Calvin cycle, each CO_2 molecule requires 2 ATP and 2 NADPH for the synthesis of one molecule of glyceraldehyde-3-phosphate (G3P).

Q.127

(3)

New NCERT Pg. No. 164, Class XI

The respiratory quotient (RQ) for fatty acids is less than 1 because their metabolism requires more oxygen than the carbon dioxide produced.

Q.128

(2)

New NCERT Pg. No. 106, Class XI

The zwitter ionic form of an amino acid has both positive (NH_3^+) and negative (COO^-) charges, typically represented in a dipolar ion structure.

Q.129

(2)

New NCERT Pg. No. 174, 175, Class XI

The discoveries related to plant growth regulators are:
A – Auxin from tips of canary grass,
B – Gibberellin were discovered from *Bakanae* disease of rice,
C – Cytokinins isolated from coconut milk,
D – Ethylene from ripened fruits.

Q.130

(1)

New NCERT Pg. No. 67, Class XI

In monocot seeds, the plumule is enclosed in a sheath called coleoptile, while the radicle is protected by coleorhiza.

Q.131

(4)

New NCERT Pg. No. 24, 27, Class XI

Rhodophyceae gametes are non-flagellated. The other pairs are correctly matched regarding their gamete characteristics.

Q.132

(4)

New NCERT Pg. No. 28, 29 Class XI

In *Marchantia*, antheridia and archegonia are produced on different thalli, making the statement incorrect.

Q.133

(3)

New NCERT Pg. No. 160, Class XI

Ubiquinone (coenzyme Q) receives electrons from complex I and complex II, not complex III.

Q.134

(2)

New NCERT Pg. No. 104, 105, 112, Class XI

Amino acids are organic compounds, not inorganic. They contain an amino group and an acidic group as substituents on the same carbon (the α -carbon).

Q.135

(4)

New NCERT Pg. No. 175, Class XI

NAA and 2,4-D are synthetic auxins, not natural.

Q.136

(1)

New NCERT Pg. No. 140, Class XI

In cyclic photophosphorylation, no NADPH + H⁺ is formed because the electrons cycle back to PS I, generating ATP instead.

Q.137 (4)
Old NCERT Pg. No. 103, Class XI
 In dense regular connective tissue, fibres and fibroblasts are compactly packed and collagen fibres are present in rows between many parallel bundles of fibres. e.g., Tendons and ligaments.

Q.138 (1)
New NCERT Pg. No. 207, Class XI
 Glomerulus is a tuft of capillaries formed by the afferent arteriole. Each kidney has nearly one million complex tubular structures called nephrons. The medulla is divided into a few conical masses (medullary pyramids) projecting into the calyces.

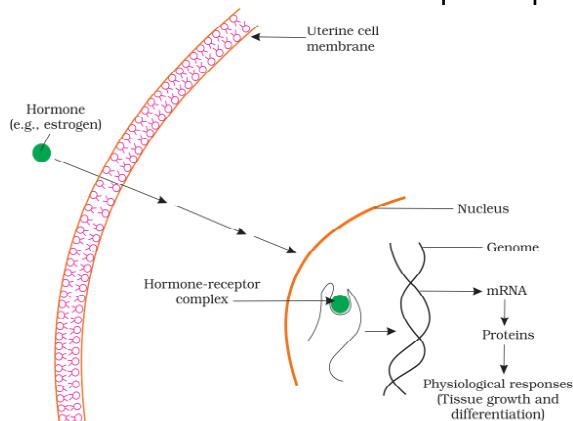
Q.139 (2)
New NCERT Pg. No. 47, Class XI
 Members of the class cyclostomata are ectoparasites on fishes. They have circular sectorial mouth and their body is devoid of scales. Unpaired fins are present. Cranium and vertebral column both are cartilaginous.

Q.140 (2)
New NCERT Pg. No. 200, Class XI
 The blood pumped by each ventricle during 1 cardiac cycle or 1 heart beat is called stroke volume.
 Cardiac output = Stroke volume × Heart rate

Q.141 (4)
New NCERT Pg. No. 126, Class XI
 The complex formed by a pair of synapsed homologous chromosomes is called a bivalent or a tetrad. It is formed in zygotene however, these are more clearly visible at the next stage, pachytene.

Q.142 (4)
New NCERT Pg. No. 45, Class XI
 The most distinctive feature of echinoderms is the presence of water vascular system which helps in locomotion, capture and transport of food and respiration.

Q.143 (3)
New NCERT Pg. No. 248, Class XI



Progesterone is a steroid hormone and hence binds to nuclear (intracellular) receptors.

Q.144 (2)
New NCERT Pg. No. 235-236, Class XI

A deep cleft divides the cerebrum longitudinally into two halves, which are termed as the left and right cerebral hemispheres. The hemispheres are connected by a tract of nerve fibres called corpus callosum.

The hypothalamus contains a number of centres which control body temperature, urge for eating and drinking.

Q.145 (4)
New NCERT Pg. No. 97, Class XI

Mitochondria contain circular DNA in their matrix. This is one of the key pieces of evidence supporting the endosymbiotic theory, which posits that mitochondria originated from free-living prokaryotes that were engulfed by ancestral eukaryotic cells. It is double membranous and possess cristae. It has 70s ribosomes.

Q.146 (3)
New NCERT Pg. No. 43, 44, Class XI

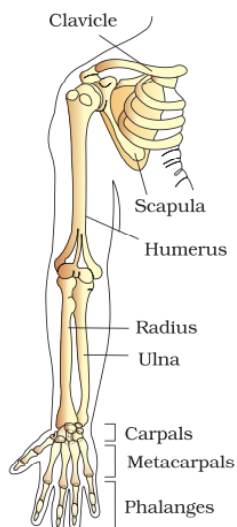
Green glands – Prawn
 Malpighian tubules – Cockroach
 Nephridia – Earthworm
 Flame cells – Planaria

Q.147 (3)
New NCERT Pg. No. 242, Class XI

Regulation of sleep-wake cycle is controlled by melatonin hormone secreted by pineal gland.

Q.148 (3)
New NCERT Pg. No. 226, Class XI

Tibia is not the bone of human forelimbs it is the bone of hindlimbs.



Q.149 (2)
New NCERT Pg. No. 126, 127, Class XI
 Splitting of centromere of each chromosomes occurs during anaphase-II of meiosis-II.

Q.150 (2)
New NCERT Pg. No. 84, Class XI
 Correct pathway for passage of sperms in male frog:
 Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca.

Q.151 (1)
New NCERT Pg. No. 190, Class XI
 Pneumotaxic centre is located in Pons region of hindbrain.

Q.152 (2)
New NCERT Pg. No. 225, 226 Class XI
 Tibia and fibula – Appendicular skeleton
 Sternum and occipital condyle – Axial skeleton
 Clavicle and scapula – pectoral girdle
 Pubis and ischium – Coxal bones

Q.153 (4)
New NCERT Pg. No. 124, 125 Class XII
 • Statement I: "Cell plate between the walls of two adjacent cells is a characteristic feature of animal cells" is incorrect. The cell plate formation is a characteristic feature of plant cell cytokinesis, not animal cells.
 • Statement II: "Meiosis involves pairing of non-homologous chromosomes and recombination between two sister chromatids of homologous chromosomes" is incorrect. Meiosis involves pairing of homologous chromosomes and recombination occurs between non-sister chromatids of homologous chromosomes.

Q.154 (2)
Old NCERT Pg. No. 102, Class XI
 Gap junctions or communicating junctions facilitate the transfer of ions, small molecules and sometimes big molecules.

Q.155 (2)
New NCERT Pg. No. 222, Class XI
 Muscle contraction takes place due to shortening of sarcomere which is because of sliding of thin filament over thick filament.

Q.156 (3)
New NCERT Pg. No. 246, 247, Class XI
 Progesterone stimulates the growth of alveoli of mammary glands and promotes the formation of milk in them.

Q.157 (3)
New NCERT Pg. No. 236, Class XI
 Thalamus is a part of forebrain. Hindbrain is composed of pons, cerebellum and medulla oblongata.

Q.158 (3)
New NCERT Pg. No. 101, Class XI
 The type of chromosome where the centromere is situated close to its end forming one extremely short and one very long arm is called acrocentric.

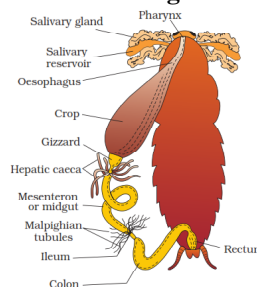
Q.159 (2)
New NCERT Pg. No. 48, Class XI
Salamandra is an amphibian which contains 3-chambered heart i.e., 2 auricles and 1 ventricle

Q.160 (3)
New NCERT Pg. No. 203, Class XI
 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 lungs is one of the main symptoms of this disease.

Q.161 (1)
New NCERT Pg. No. 126, Class XI
 Meiosis increases genetic variability due to crossing over during prophase I. The stage of meiosis I where this occurs is pachytene, and recombination nodules are the sites of crossing over.

- Q.162** (2)
New NCERT Pg. No. 46, 47 Class XI
Salpa – urochordata
Chelone – reptilia
Petromyzon – cyclostomata
Felis – mammalia
- Q.163** (1)
New NCERT Pg. No. 241, 242, Class XI
Pituitary gland – Gigantism
Pancreas – Diabetes mellitus
Adrenal gland – Addison’s disease
Thyroid gland – Grave’s disease
- Q.164** (4)
Old NCERT Pg. No. 101, Class XI
Simple squamous epithelium is present in walls of blood vessels.
- Q.165** (4)
New NCERT Pg. No. 209, Class XI
Reabsorption in different segments of nephron takes place by active, passive and facilitated transport.
- Q.166** (3)
New NCERT Pg. No. 93, Class XI
The cell membrane is composed of lipids arranged in a bilayer, and proteins are embedded within this lipid bilayer. The head faces the outside while tail is towards inside.
- Q.167** (3)
New NCERT Pg. No. 110, Class XI
Cellulose lacks branches and complex helixes in its structure. In a polysaccharide, right end is reducing end and left end is non-reducing end.
- Q.168** (2)
New NCERT Pg. No. 198, Class XI
Heart is protected by a double walled bag like structure called pericardium. The atrium and ventricle of same side are separated by a thick atrio-ventricular septum.
- Q.169** (2)
New NCERT Pg. No. 44, Class XI
Feather – like gill called ctenidia is present in the mantle cavity of the mollusca.
- Q.170** (2)
New NCERT Pg. No. 236, Class XI
Limbic system regulates emotions and human behaviour.

- Q.171** (3)
Old NCERT Pg. No. 113, Class XI, CH.-7



- Q.172** (4)
New NCERT Pg. No. 41, Class XI
Adamsia do not exhibits alternation of generation.

- Q.173** (3)
New NCERT Pg. No. 207, Class XI
In a nephron, renal corpuscle or malpighian body is formed by Bowman’s capsule and glomerulus.

- Q.174** (3)
New NCERT Pg. No. 112, Class XI
In a protein chain, first amino acid is N-terminal and last amino acid is C-terminal.

- Q.175** (3)
New NCERT Pg. No. 242, Class XI
Pineal gland is located on dorsal side of forebrain. It releases a hormone called melatonin.

- Q.176** (4)
New NCERT Pg. No. 95, Class XI
Ribosomes are present in mitochondria, chloroplasts, and the endoplasmic reticulum. However, ribosomes are not found in the smooth endoplasmic reticulum, which is involved in lipid synthesis and lacks ribosomes.

- Q.177** (3)
New NCERT Pg. No. 108, 109, Class XI
The molecules present in acid insoluble fraction with the exception of lipids are polymeric substances. Lipid is not a polymer.

- Q.178** (1)
New NCERT Pg. No. 46, Class XI
In urochordates, notochord is present only in larval tail. While in cephalochordates, it extends from head to tail region and is persistent throughout life.

Q.179 (4)

New NCERT Pg. No. 205, Class XI



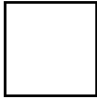
Ammonotelic: Bony fishes, aquatic amphibians and aquatic insects.

Ureotelic: Mammals, terrestrial amphibians and marine fishes.

Uricotelic: Reptiles, birds, land snails and insects.

Q.180 (3)

New NCERT Pg. No. 236, Class XI



Hypothalamus – lies at base of thalamus

Corpora quadrigemina – round swellings in midbrain

Corpus callosum – A tract of nerve fibres

