KEV

				ANSW	ER KE	Y			
			NE	EET (FIN	NAL TRA	ACK)			
			P	ART TE	ST-06 (X	XII)			
PHYSICS									
Q.1(3)	Q.2 (2)	Q.3 (1)	Q.4 (1)	Q.5(4)	Q.6(3)	Q.7 (3)	Q.8 (1)	Q.9 (2)	Q.10 (3)
Q.11(3)	Q.12 (4)	Q.13(2)	Q.14 (4)	Q.15(4)	Q.16(2)	Q.17(2)	Q.18 (4)	Q.19(2)	Q.20(2)
Q.21(2)	Q.22 (1)	Q.23(4)	Q.24 (3)	Q.25(2)	Q.26 (2)	Q.27 (1)	Q.28 (1)	Q.29(3)	Q.30 (1)
Q.31(3)	Q.32 (2)	Q.33 (4)	Q.34 (3)	Q.35(4)	Q.36(2)	Q.37 (1)	Q.38 (1)	Q.39(3)	Q.40(3)
Q.41(2)	Q.42 (1)	Q.43 (3)	Q.44 (1)	Q.45 (3)	Q.46 (4)	Q.47 (1)	Q.48 (2)	Q.49 (3)	Q.50(4)
				CHE	MISTRY				
Q.51(1)	Q.52 (3)	Q.53(2)	Q.54 (4)	Q.55 (3)	Q.56 (3)	Q.57 (3)	Q.58 (2)	Q.59 (1)	Q.60 (3)
Q.61(2)	Q.62(4)	Q.63 (1)	Q.64 (1)	Q.65(2)	Q.66(3)	Q.67(4)	Q.68(4)	Q.69(3)	$\mathbf{Q.70}(3)$
Q.71 (1)	Q.72(4)	Q.73(2)	Q.74(2)	$\mathbf{Q.75}(3)$	$\mathbf{Q.76}(3)$	Q.77(3)	$\mathbf{Q.78}(4)$	Q.79(4)	Q.80(4)
Q.81 (4)	Q.82(3)	Q.83 (4)	Q.84 (1)	Q.85 (3)	Q.86(4)	Q.87 (1)	Q.88 (1)	Q.89 (3)	Q.90 (2)
Q.91(2)	Q.92 (1)	Q.93 (2)	Q.94 (2)	Q.95 (2)	Q.96 (1)	Q.97 (3)	Q.98 (2)	Q.99 (1)	Q.100 (4)
				BIO	LOGY				
Q.101 (1)	Q.102(3)	Q.103(3)	Q.104(2)	Q.105 (3)	Q.106(2)	Q.107(2)	Q.108 (4)	Q.109 (1)	Q.110(4)
Q.111 (3)	Q.112 (3)	Q.113 (3)	Q.114(3)	Q.115(2)	Q.116(4)	Q.117 (4)	Q.118 (2)	Q.119 (3)	Q.120(3)
Q.121 (3)	Q.122(2)	Q.123 (4)	Q.124(2)	Q.125 (1)	Q.126(2)	Q.127(3)	Q.128(2)	Q.129 (1)	Q.130(3)
Q.131 (3)	Q.132(3)	Q.133 (4)	Q.134 (4)	Q.135 (1)	Q.136(4)	Q.137(3)	Q.138 (3)	Q.139 (1)	Q.140(4)
Q.141 (3)	Q.142(3)	Q.143 (1)	Q.144 (4)	Q.145(2)	Q.146 (4)	Q.147(3)	Q.148 (3)	Q.149(3)	Q.150 (1)
Q.151(2)	Q.152 (4)	Q.153(3)	Q.154(2)	Q.155 (1)	Q.156(3)	Q.157 (1)	Q.158(4)	Q.159 (1)	Q.160 (1)
Q.161(2)	Q.162(4)	Q.163 (4)	Q.164(3)	Q.165 (3)	Q.166 (4)	Q.167 (1)	Q.168 (4)	Q.169 (4)	Q.170(3)
Q.171 (4)	Q.172(2)	Q.173(2)	Q.174(3)	Q.175(4)	Q.176(2)	Q.177 (2)	Q.178 (1)	Q.179 (4)	Q.180 (1)
la 404 (0)									

SOLUTIONS

Q.186(4)

Q.196(3)

Q.187(1)

Q.197 (4)

Q.185(1)

Q.195(3)

PHYSICS SECTION-A

Q.183 (3)

Q.193(1)

Q.1 (3) |Incoming flux| = |Outgoing flux| Incoming flux = $-\phi$ Outgoing flux = $+\phi$ $\therefore \text{ Net flux} = \phi_{\text{in}} + \phi_{\text{out}} = \phi - \phi = 0$

Q.182(4)

Q.192(2)

Q.181 (3)

Q.191 (4)



Q.184 (4)

Q.194(2)

Q.2 (2) Force between two charges is independent of presence and absence of third charge



Q.3 (1) (1) m, –2q 2qE**←** $a_{_{1}}\!=\frac{2qE}{m}\,,$ $a_2 = \frac{2qE}{2m} = \frac{qE}{m}$ Velocity after time (t)



Q.188 (2)

Q.198(3)

Q.189 (4)

Q.199(4)

$$\frac{K.E_1}{K.E_2} = \frac{\frac{1}{2}m_1V_1^2}{\frac{1}{2}m_2V_2^2} = \frac{m\bigg(\frac{2qE}{m}t\bigg)^2}{2m\bigg(\frac{qE}{m}t\bigg)^2} = \frac{2}{1}$$

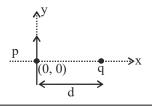
(1) $\phi_{in} = -3 \times 10^{5} \text{ wb}, \phi_{out} = 4 \times 10^{5}$ $\phi_{net} = \phi_{in} + \phi_{out} = -3 \times 10^{5} + 4 \times 10^{5} = 10^{5}$ **Q.4**



Q.190(4)

Q.200(2)

 $Q_{in} = \varepsilon_0 \phi_{net} = 8.85 \times 10^{-12} \times 10^5 = 8.85 \times 10^{-7} C$ (4) Q.5





At equitorial position electric field = $\frac{-kp}{r^3}$

direction of electric field is opposite to \vec{p}

$$\therefore F = q \left(\frac{kp}{d^3}\right) (-\hat{j}) = \frac{kpq}{d^3} (-\hat{j})$$

Q.6 (3)

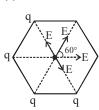
$$\phi = \vec{E} \cdot \vec{A}$$

$$= (2\hat{i} + 3\hat{j} + \hat{k}) \cdot \pi R^2 \hat{i}$$

$$= 2\pi R^2$$



Q.7 (3)





$$E_{net} = 2E \cos\left(\frac{60}{2}\right) = 2 \cdot \frac{kq}{a^2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}kq}{a^2}$$

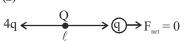
$$E_{net} = \frac{\sqrt{3}q}{4\pi\epsilon_0 a^2}$$

Q.8 (1) Surface charge density σ is more at sharp points



Also $E = \frac{\sigma}{\epsilon_0}$

Q.9 (2)

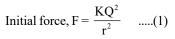




$$\frac{KQq}{\ell^{2/4}} + \frac{K4q}{\ell^2} = 0$$

$$q = -Q$$

Q.10 (3





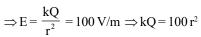
New force,
$$4F = \frac{K(Q+2)(Q)}{r^2}$$
....(2)

From (1) and (2) $(Q+1)(q) = 4Q^2$ $\Rightarrow Q+2=4Q$ 2=3Q

$$\Rightarrow$$
 Q = $\frac{2}{3}$ C

Q.11 (3)

At r = 20 cm

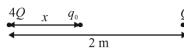




At r' 3 cm
$$\Rightarrow$$
 E = $\frac{kQr}{R^3} = \frac{(100r^2)r'}{R^3}$

$$= \frac{100 \times (20 \times 10^{-2}) \times 3 \times 10^{-2}}{(10 \times 10^{-2})^3} = 120 \text{V/m}$$

Q.12 (4)





$$F_0 = 0$$

$$k \frac{4q_0Q}{x^2} = k \frac{q_0Q}{(2-x)^2}$$

$$\frac{2}{x} = \frac{1}{(2-x)}$$

$$4-2x = x \Rightarrow x = \frac{4}{3}m$$

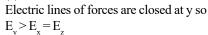
Q.13 (2

Electrostatic field is a conservative field so the electric line of forces can never form a closed loop.



Electric line of forces starts from the positive charge and terminate on negative charge. No. of electric lines of forces $\propto |Q|$

Q.14 (4)





Q.15 (4) Conductors are equipotential surface so $V_A = V_B = V_C$



Q.16 (2)

$$V = \frac{Kq}{r}$$



$$V = \frac{q}{4\pi\epsilon_0 a}$$

Q.17 (2





$$E_{x=23} = -\left(-\frac{10}{30-20}\right) = \frac{10}{10} = 1 \text{ V/m}$$

Q.18 (4)

$$E = \frac{-dV}{dx} = \frac{-d}{dx} (4x) = -4 V/m$$



Net Flux =
$$\epsilon$$

Charge enclosed = Net flux $\times \varepsilon_0$ Since Net flux through the closed cube is zero due to constant uniform electric field.

$$\Rightarrow$$
 Charge = 0



$$U = -\frac{k2qQ}{a} + \frac{2kq^2}{a} - \frac{kQq}{a}$$



$$-2Q + 2q - Q = 0$$

$$Q = \frac{2q}{3}$$

Q.20

Potential at surface =

Potential at centre = 20 V



Q.21

Net potential =
$$\frac{KQ_{net}}{r}$$



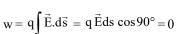
$$=\frac{9\times10^{9}\times5\times10^{-6}}{10\times10^{-2}}=45\times10^{4}\,\mathrm{V}$$

Q.22 (1)

 $w = q\Delta V$

For equipotential surface ($\Delta V = 0$)







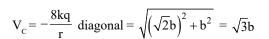


Potential energy of dipole in electric field $U = -PE \cos \theta$;

where $\boldsymbol{\theta}$ is the angle between electric field and dipole.







$$V_{C} = -\frac{8kq}{\left(\frac{\sqrt{3}b}{2}\right)} \qquad r = \frac{\sqrt{3}b}{2}$$

$$V_{c} = -\frac{1}{4\pi\epsilon_{0}} \frac{8q}{\frac{\sqrt{3}b}{2}} = -\frac{4q}{\sqrt{3}\pi\epsilon_{0}b}$$

Potential energy = $qV_c = -\frac{4q^2}{\sqrt{3}\pi\epsilon_0 b}$

Q.25

$$Q = \lambda(R\theta) = \frac{\lambda R\pi}{3} = \frac{(4)(4)\pi}{3} = \frac{16\pi}{3}$$



$$V = \frac{kQ}{r} = \frac{9 \times 10^9 \times 16\pi}{3 \times 4} = 12\pi \times 10^9 = 3.8 \times 10^{10} V$$

Q.26

 $V_B > V_A$, so, $V_B - V_A$ will be positive. If d denotes effective displacement between two points along the field, then



 $d_{AB} = 2 \cos 60^{\circ} = 1 \text{ m}$

Now
$$d_{BC} = 2.0 \text{m}$$

 $V_B - V_C = 10(2) = 20 \text{ V}$

Now,
$$\frac{V_B - V_A}{V_B - V_C} = \frac{10}{20} = 1:2$$

Q.27 Charge remains the same



Q.28 (1)





$$V_{c} \neq 0$$

E=0

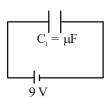
Q.29 (3)

$$C = \frac{\varepsilon_0 A}{d}$$



$$\Rightarrow \frac{C_1}{C_2} = \frac{A_1}{A_2} \frac{d_1}{d_2} = \frac{A_1}{2A_1} \times \left(\frac{1}{d_1}\right) \left(\frac{d_1}{3}\right) = \frac{1}{6} \Rightarrow C_2 = 6C_1$$

Q.30 (1)







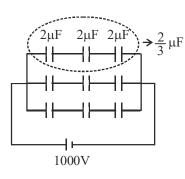
$$Common potential = \frac{C_1V_1 + C_2V_2}{C_1 + C_2}$$

$$= \frac{90+0}{10+20} = 3V$$

$$Q' = C_2 V = 20 \times 10^{-6} \times 3 = 6 \times 10^{-5} C$$
(3)

Q.31

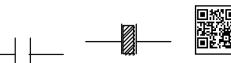




$$C_{eq} = 2\mu F = \frac{2}{3}n, n = 3$$

No of capacitors = 9

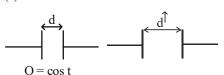
Q.32 (2)



$$U_{0} = \frac{1}{2}CV^{2} = \frac{Q^{2}}{2C} \quad U' = \frac{Q^{2}}{2C^{1}} = \frac{Q^{2}}{2KC} = \frac{U_{0}}{K}$$

Decreased by =
$$\frac{U_0 - U_0}{K} = U_0 \left(1 - \frac{1}{K}\right)$$

Q.33 (4)



$$C = \frac{e_0 A}{d} \Rightarrow d \uparrow c \downarrow$$

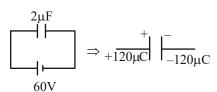
Q = constant

$$\therefore V \uparrow, \qquad U = \frac{Q^2}{2c} \therefore U \uparrow$$

$$E = \frac{Q}{A\epsilon_0}$$
 $Q = constant$

$$\therefore$$
 E = constant

Q.34 (3)

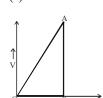




$$\Rightarrow \frac{^{+120\mu\text{C}}}{\overset{-120\mu\text{C}}{\downarrow}} = \frac{^{-120\mu\text{C}}}{\overset{-120\mu\text{C}}{\downarrow}}$$

$$V = \frac{Q_1 + Q_2}{C_1 + C_2} = \frac{120 \mu C + 0}{2 \mu F + 1 \mu F} = \frac{120}{3} = 40 \, V$$

Q.35 (4)

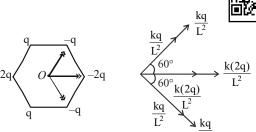




Area = $\frac{1}{2}$ qV = Energy stored in capacitor

SECTION-B

Q.36 (2)



$$E_{net} = \frac{4kq}{L^2} + \frac{2kq}{L^2} \left(\frac{1}{2}\right) + \frac{2kq}{L^2} \left(\frac{1}{2}\right)$$
$$= \frac{6kq}{L^2} = \frac{1}{4\pi\epsilon_0} \frac{6q}{L^2} \text{ along OD}$$

Q.37 (1)

$$\varphi_{s_1} = \frac{\text{ch arge enclosed by } s_1}{\epsilon_0} = \frac{3Q - Q}{\epsilon_0} = \frac{2Q}{\epsilon_0}$$



$$\varphi_{s_2} = \frac{ch \, arge \; enclosed \, by \, s_2}{\epsilon_0} \; = \; \frac{2Q-Q}{\epsilon_0} = \; \frac{Q}{\epsilon_0} \label{eq:phisperson}$$

$$\varphi_{s_3} = \frac{ch\,arge\,\,enclosed\,\,by\,s_3}{\epsilon_0} \,\,=\, \frac{3Q}{\epsilon_0}$$

Q.38 (1)

$$F = qE$$

 $E = \frac{40}{4}$



Force on negative charge will be opposite to electric field.

Q.39 (3) $\therefore \alpha > \beta$ $\Rightarrow m_1 < m_2$ Nothing can't be said about charge.



Q.40 (3)

$$x = \sqrt{3}R$$

 $E = \frac{kQx}{(R^2 + x^2)^{3/2}}$



$$E = \frac{kQ}{(R^2 + 3R^2)^{3/2}} \sqrt{3}R$$

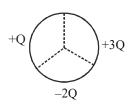
$$E = \frac{kQ}{8R^3} \sqrt{3}R = \frac{\sqrt{3}}{8} \frac{kQ}{R^2}$$

Q.41 (2)

Due to +ve charge E is away from charge & due to -ve towards.



Q.42 (1)





$$V = \frac{kQ}{R} + \frac{k(3Q)}{R} + \frac{k(-2Q)}{R}$$
$$= \frac{2kQ}{R} = \frac{2Q}{4\pi\epsilon_0 R} = \frac{Q}{2\pi\epsilon_0 R}$$

Q.43 (3)

$$E = \frac{\sigma}{2\epsilon_0}$$



$$\frac{dV}{dr} = \frac{\sigma}{2\epsilon_0}$$

$$dr = \frac{\epsilon_0 dV \times 2}{\sigma}$$

 $=4.4 \, \mathrm{mm}$

$$= \frac{8.8 \times 10^{-12} \times 100 \times 2}{4 \times 10^{-7}}$$
$$= 2.2 \times 10^{-3} \text{ m} \times 2$$

Q.44 (1)

$$w = q(V_f - V_i) = -Q[V_D - V_C]$$



$$= -Q \Biggl[\Biggl(\frac{K(2q}{3L} - \frac{kq}{L} \Biggr) - \Biggl(\frac{k(2q)}{L} - \frac{kq}{L} \Biggr) \Biggr] = \frac{1}{4\pi\epsilon_0} \frac{4Qq}{3L}$$

Q.45 (3)

$$V_A - V_0 = -\int_O^A E_x dx$$



$$V_{A} - V_{0} = \int_{0}^{2} 30x^{2} dx$$

$$=-30 \frac{2^3}{3} = -80 \text{V}$$

Q.46 (4)

$$\frac{\mathrm{E}_1}{\mathrm{E}_2} = \frac{\mathrm{R}_1}{\mathrm{R}_2}$$



$$\frac{V_1}{V_2} = \frac{E_1 R_1}{E_2 R_2} = \frac{R_1}{R_2} \times \frac{R_1}{R_2} = \left(\frac{R_1}{R_2}\right)^2$$

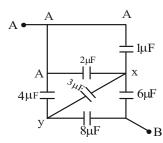
Q.47 (1)

$$E = -\frac{dV}{dr} = -4ar = \frac{\rho r}{3\epsilon_0}$$
 (compare)

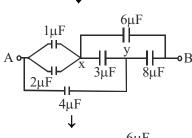


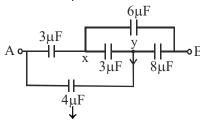
Result inside uniformly charged solid sphere. $\rho = -12a\epsilon_0$

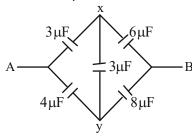
Q.48 (2)



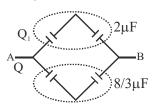








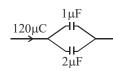
 $\frac{3}{4} = \frac{6}{8}$ Balanced wheatstone bridge



$$C_{eq} = 2 + \frac{8}{3} = \frac{14}{3} \mu F$$

$$Q = C_{eq}V = \frac{14}{3} \times 60 = 280 \mu C$$

$$Q_1 = \frac{2}{2 + \frac{8}{3}} \times 280 = \frac{6}{14} \times 280 = 120 \mu C$$



Charge on $2\mu F = \frac{2}{3} \times 120 = 80\mu C$

Q.49



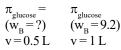
Q.50 (4)

$$C = \frac{\varepsilon_0 A}{d}$$
,

d: seperation between the plates



Q.51 (1)





$$\frac{w_{B}}{mm \times 0.5} = \frac{9.2}{mw \times 1}$$

$$w_{B} = 0.5 \times 9.2 = 4.6 \text{ g}$$

Q.52 Given $w_b = 0.5 g$ mm₃ = 100 $W_A = 25g = 25 \times 10^{-3} \text{ kg}$ $\Delta T_b = 1 \text{ K}$



$$\Delta T_{_b} \!=\! K_{_b} \!\times \frac{w_{_B}}{mm_{_B} \!\times\! w_{_A}(kg)}$$

$$K_{_{b}}\!=\frac{1\!\times\!100\!\times\!25\!\times\!10^{^{-3}}}{0.5}$$

$$K_b = 5$$

Q.53

Molarity is the number of moles per litre



$$900 \text{ g of H}_2\text{O} = \frac{900}{18} \text{ moles} = 50 \text{ moles}$$

 $900 \text{ g of H}_2\text{O} = 900 \text{ mL of H}_2\text{O} \text{ (} \therefore \text{ density} = 1 \text{g/mL} \text{)}$

Vol. in L =
$$\frac{900}{1000}$$
 L

$$M = \frac{50 \times 1000}{900} = 55.5 M$$

Q.54 $4A \rightarrow A_4$ n=4; $\alpha = 80\% = 0.8$ $\alpha = \frac{i-1}{1-1}$ (for Association)



$$i = 1 + \left(\frac{1}{n} - 1\right)\alpha$$

$$i = 1 + \left(\frac{1}{4} - 1\right) 0.8$$

$$\Delta T_{f} = i \times k_{f} \times \frac{\left(w_{B}\right)_{g} \times 1000}{mm_{B} \times \left(w_{A}\right)_{g}}$$

$$mm_{_{B}} = \frac{0.4 \times 1.86 \times 2.5 \times 1000}{0.3 \times 100}$$
= 62

$$\begin{array}{c}
 (3) \\
 nA \\
 t = 0
 \end{array}$$





$$t = eq$$

Total particles at eq = $1 - \alpha + \frac{\alpha}{n}$

$$i = \frac{no \ of \ particles \ aqualibrium}{initial \ no \ of \ particles}$$

$$i = 1 - \alpha + \frac{\alpha}{n}$$



(3)
$$P_T = 0.195 X_A + 0.315$$
(i)

$$P_{T} = P_{A}^{\circ} X_{A} + P_{B}^{\circ} X_{B}$$



$$P_{T} = (P_{A}^{\circ} - P_{B}^{\circ})X_{A} + P_{B}^{\circ}$$
(ii)

On comparing above equation (ii) by equation (i) we get.

$$P_{\rm B}^{\circ} = 0.315 \, atm$$

(3)

$$W_B = 20 \text{ g}; \quad W_A = 200 \text{ g} = 0.2 \text{ kg}$$

 $\Delta T_b = 1, \quad K_b = 2.53$



$$\Delta T_{_{b}}\!=\!k_{_{b}}\!\times\frac{\left(w_{_{B}}\right)_{g}}{mm\!\times\!\left(w_{_{A}}\right)_{kg}}$$

$$mm = \frac{2.53 \times 20}{1 \times 0.2} = 253 \, g$$



(2)

$$\pi = 1$$
 atm, $T = 27^{\circ}C = 300 \text{ k}$

$$i = 2.9; v = 4 L$$

$$\pi = \frac{i \times w_B \times R \times T}{mm_B \times v}$$

$$1 = \frac{2.9 \times w_{_B} \times 0.082 \times 300}{(40 + 2 \times 35.5) \times 4}$$
$$w_{_B} = 6.21 \text{ g}$$



(1)

(i) of $Na_2SO_4 >$ (i) of KCl so for same concentration:

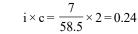
higher the valve of (i); higher will be boiling point of solution.



$$\frac{7g}{L}MgCl_2 = \frac{7}{95}\frac{mol}{L}MgCl_2(aq)solution$$

$$i \times c = \frac{7}{95} \times 3 = 0.22$$

$$\frac{7g}{L} \text{NaCl} = \frac{7}{58.5} \frac{\text{mol}}{L} \text{NaCl(aq)} \text{solution}$$



Lower the $(i \times c)$ value higher will be freezing point.

Q.60 (3)

For same concentration lower the value of (i); higher is the freezing point of aq solution.



Q.61 (2

⇒ Carbon disulphide and acetone mixture show positive deviation. ⇒ Ethanol and acetone mixture show positive deviation.



Q.62 (4) at 373; $(P^0)_{water} = 760 \text{ mmHg}$

$$\frac{\mathbf{P}^0 - \mathbf{P}}{\mathbf{P}^0} = \mathbf{X}_{\text{solute}}$$

$$X_{\text{solute}} = \frac{760 - 750}{760} = \frac{1}{760}$$



Q.63 (1

Molality (m) =
$$\frac{30}{60 \times 1} = 0.5$$



1 molal solution means

1 mol of solute is present in 1kg (1000g) of solvent.

Q.64 (1)

$$M = \frac{\left(W_{B}\right)_{g}}{mm_{P} \times V(L)}$$



$$W_{B} = M \times V \times mm_{B}$$

$$= 0.2 \times 0.4 \times 63$$

$$= 5.04 \text{ g}$$

Q.65 (2

$$w_B = 3.42 g$$

 $V = 100 \text{ mL} = 0.1 \text{ L}$
 $T = 27^{\circ}\text{C} = 300 \text{ K}$



$$= \frac{\left(wg\right)_{B} \times R \times T}{mm_{B} \times V_{\text{solution}}}$$

 $\pi = CRT$

$$=\frac{3.42 \times 0.0821 \times 300}{342 \times 0.1}$$

$$\pi = 2.463 \text{ atm}$$

Q.66 (3

Molal depression constant (K_f) is a constant. Value of K_f does not depend on molality of solution.



Q.67 (4)

> (a) Ethanoic acid in benzene gets dimerize so van't Hoff factor



(i) < 1. so observed colligative

property is less than calculated colligative property.

- (b) Value of (i) for KCl, NaCl and MgSO_{α} is = 2 (As solution is very dilute)
- (c) Osmotic pressure can be determined at room temperature so it is used to determine molar mass of macromolecules like proteins polymers etc.



Azeotropic mixture can not be separated by distillation so it is not possible to obtain either C₂H₅ OH or water.



Q.69 (3)

> Metals with negative electrode potential liberate hydrogen from acids.



Q.70

$$Conductivity = \frac{cell constant}{Resistance}$$



$$k = \frac{\sigma}{R}$$

$$\sigma = k \times R$$

$$\sigma = \frac{1}{\rho} \times \frac{1}{G} = (G\rho)^{-1}$$

Q.71

Fe³⁺ + 3e⁻
$$\rightarrow$$
 Fe; E₁° = -0.036,
 Δ G₁° = -3FE₁°(i)
Fe²⁺ + 2e⁻ \rightarrow Fe; E₂° = -0.44,
 Δ G₂° = -2FE₂°(ii)



...(iii)

Calculation of E⁰ for

$$Fe^{3+} + e^{-} \rightarrow Fe^{2+}$$

applying (i) – (ii); we get eq (iii) so;

$$\Delta G_1^{\circ} - \Delta G_2^{\circ} = \Delta G_3^{\circ}$$

 $-3FE_1^{\circ} - (-2FE_2^{\circ}) = -1FE_3^{\circ}$

$$-3FE_1^{\circ} - (-2FE_2^{\circ}) = -1FE_3$$

$$-F(3E_1^{\circ}-2E_2^{\circ}=-FE_3^{\circ})$$

$$E_3^{\circ} = \frac{E_1^{\circ} \times 3 - E_2^{\circ} \times 2}{1}$$

$$E_3^{\circ} = -0.036 \times 3 - (-0.44) \times 2 = 0.772$$

Q.72 (4)

Standard hydrogen electrode (S.H.E) has been universally accepted as a reference electrode and has been assigned a value of zero.



Q.73

$$E = -0.059 \times pH$$

$$\begin{split} E_{p} &= -0.059 \times pH \\ E_{p} &= -0.059 \times 0.1 \\ E_{p} &= -0.0059 \text{ V} \end{split}$$

$$E_{\rm m}^{'} = -0.0059 \, \text{V}$$



Q.74

$$\Lambda_{\rm m(Al(OH)_3}^{\rm o} = \frac{1}{2} \ \Lambda_{\rm mAl_2(SO_4)_3}^{\rm o} + 3 \ \Lambda_{\rm mNH_4OH}^{\rm o} - \frac{3}{2} \ \Lambda_{\rm m(NH_4)_2SO_4}^{\rm o}$$

$$= \left[\frac{1}{2} \times 858\right] + \left[3 \times 238.3\right] - \left[\frac{3}{2} \times 238.4\right]$$



 $=429+684.9-357.6=786.3 \text{ S cm}^2 \text{ mol}^{-1}$

Q.75 $Pt(s)\,|\,Br,aq.\,|\,Br^-(aq.)$ half reaction is represented as



 $\frac{1}{2} Br_2 aq + e^- \rightarrow Br^- (aq.)$

Q.76 At equilibrium; $Q = k_{eq}$ and $E_{cell} = 0$



Q.77

In galvanic cell; anode is negative and cathode is positive terminal. In electrolytic cell; anode is positive and cathode is negative terminal.



Q.78

$$Zn_{(aq)}^{+2} + 2e^{-} \rightarrow Zn(s)$$
_{1 mole}



Q.79

$$\lambda_{\text{NaCl}}^0 = 126$$

$$\lambda_{VP_{\pi}}^{0} = 152, \qquad \lambda_{VCI}^{0} = 150$$

$$\lambda_{NaBr}^0 = \lambda_{NaCl}^0 + \lambda_{KBr}^0 - \lambda_{KCl}^0$$

$$\lambda_{\rm NaBr}^{\rm 0} = 126 + 152 - 150$$

$$=128$$

Q.80 (4)

> Anode reaction of fuel cell is given as below: $2H_2(g) + 4OH_{(aq)}^- \rightarrow 4H_2O + 4e^-$



Q.81

Given information is about PbO₂.



Q.82

$$Mg(s) + 2Ag^{+}_{(aq)} \rightarrow Mg^{2+}_{(aq)} + 2Ag(s)$$



$$EMF = E_{cathode}^{0} - E_{anode}^{0}$$

$$= [0.80 - (-2.36)]$$

$$EMF = 3.16 V$$

Q.83 **(4)**

 $Cu(s) | Cu^{2+}(0.01m) | | Cu^{2+}(0.001m) | Cu(s)$ Standard cell potential i.e., $E^0 = 0$ for concentration cell.



Q.84 (1)

> Lower the value of E⁰, more is the reducing power; so order of reducing power C > A > B



Q.85 (3)

According to Faraday's first law.

$$\frac{W_{_{H_2}}}{W_{_{O_2}}} = \frac{Z_{_{H_2}}}{Z_{_{O_2}}}$$

$$\frac{W_{_{\rm H_2}}}{W_{_{\rm O_2}}} = \frac{E_{_{\rm H_2}}}{E_{_{\rm O_2}}}$$

$$\frac{0.500}{W_{O_2}} = \frac{1}{8}$$

$$W_{O_2} = 4.00g$$



SECTION-B

Q.86

Solution of two liquids showing positive deviation from Raoult's law so this is minimum boiling azeotrope. Thus boiling point of the mixture is less than either of their individual boiling point.



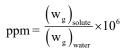
Q.87 (1)

On mixing n-heptane with ethanol; hydrogen bonds between ethanol rupturs and new bond between



heptane and ethanol molecule is formed which is weaker so mixture will form non-ideal solution showing positive deviation.

Q.88 (1)





$$=\frac{4\times10^{-3}}{1000}\times10^{6}=4\,ppm$$

Q.89 (3)

> Experimental molar mass of solute can be less or more than true value, it depend whether the solute get dissociate or associate in solvent.



⇒ Due to dissociation of solute molecule into ions molar mass is found to be lesser than true value.

Q.90 (2)

$$\pi_{A} = \pi_{\text{sucrose}}$$

$$C_{A}RT = C_{\text{sucrose}}RT$$



 $\frac{n_A}{v} = \frac{n_{\text{sucrose}}}{v}$

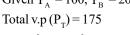
$$\frac{\left(\mathbf{W}_{g}\right)_{A}}{\mathbf{mm}_{A}} = \frac{\left(\mathbf{W}_{g}\right)_{\text{sucrose}}}{\mathbf{mm}_{\text{sucrose}}}$$

$$\frac{1}{mm_A} = \frac{5}{342}$$

$$mm_{A} = 68.4$$

Q.91 (2)

Given
$$P_A^{\circ} = 100$$
, $P_B^{\circ} = 200$



$$P_{T} = P_{A}^{\circ} X_{A} + P_{B}^{\circ} (1 - X_{A})$$

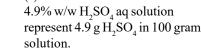
$$P_{T} = P_{B}^{\circ} + X_{A} (P_{A}^{\circ} - P_{B}^{\circ})$$

$$175 = 200 + X_A (100 - 200)$$

 $X_A = 0.25$

$$Y_A = \frac{P_A^{\circ} X_A}{P_T} = \frac{100 \times 0.25}{175} = 0.142$$

Q.92





d = 1.98 g/mL

$$vol. \ of \ solution = \frac{mass \ of \ solution}{d_{solution}}$$

$$v = \frac{100g}{1.98g} \times mL = \frac{100}{1.98} mL$$

$$m = \frac{n}{v} = \frac{4.9/98}{100/1.98} \times 1000 = 0.99$$

Q.93

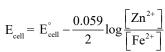
When lead storage battery is charging sulphuric acid is regenerated.



 $2PbSO_4(s) + 2H_2O(\ell) \rightarrow Pb(s) + PbO_2(s) + 2H_2SO_4(aq)$

Q.94

$$Zn(s) | Zn^{2+}(0.01) || Fe^{2+}(0.001) | Fe(s)$$





$$0.2965 = E_{cell}^{\circ} - \frac{0.059}{2} log \frac{10^{-2}}{10^{-3}}$$

$$E_{\text{cell}}^{\circ} = 0.2905 + \frac{0.059}{2} \log 10$$

$$E_{cell}^{\circ} = 0.32 \text{ V}$$

$$K_{eq} = \frac{10^{+\frac{n \times E_{eell}^{\circ}}{0.059}}}{10^{+\frac{2 \times 0.32}{0.059}}} = 10^{-\frac{1}{2}}$$

$$= 10^{+\frac{2 \times 0.32}{0.059}} = 10^{\frac{0.32}{0.0295}}$$

Q.95 (2

Net cell reaction

$$H_2(g) + 2H_{aq}^+ \rightarrow 2H_{aq}^+ + H_2(g)$$



$$E_{cell} = E_{cell}^{\circ} - \frac{RT}{nF} \ln Q$$

$$E = 0 - \frac{RT}{2F} ln \frac{P_2}{P_1}$$

$$E = \frac{RT}{2F} ln \frac{P_1}{P_2}$$

Q.96 (1)

If $E_{\rm ext}$ < 1.1 v then the daniell cell act as galvanic cell and electron froms from zinc to copper and zinc is dissolved as Zn^{2+} in solution.



O.97 (3)

Net cell reaction:

$$H_{2}(g) + 2H_{(aq)}^{+} \longrightarrow 2H_{aq}^{+} + H_{2}(g)$$

$$(0.001m) \qquad (10^{-8} m)$$



$$E_{cell}^{}=\,E_{cell}^{^{\circ}}-\frac{0.059}{2}log{\left(\frac{10^{-8}}{0.001}\right)^{\!2}}$$

$$E_{cell} = 0 - \frac{0.059}{2} \log 10^{-10}$$

$$E_{cell} = 0.295 \text{ V}$$

Q.98 (2)





$$\alpha = \frac{\Lambda_m}{\Lambda_m^0}$$

$$K_{a} = \frac{C \times \frac{\Lambda_{m}^{2}}{\Lambda_{m}^{0 \ 2}}}{1 - \frac{\Lambda_{m}}{\Lambda_{m}^{0}}} \qquad \qquad \Rightarrow K_{a} = \frac{C \Lambda_{m}^{2}}{\left(\Lambda_{m}^{0} - \Lambda_{m}\right) \Lambda_{m}^{0}}$$

=0.34-(-0.40)

Q.99 (1)
$$Cd + Cu^{2+} \rightarrow Cu + Cd^{2+}$$

$$E_{cell}^{\circ} = E_{Cu^{2+}/Cu}^{\circ} - E_{Cd^{2+}/Cd}^{\circ}$$



$$E_{cell}^{\circ} = 0.74 \text{ V}$$

$$E_{cell}^{\circ} > 0$$

Q.100 (4)

For standard hydrogen electrode

$$2H_{aq}^{+} + 2e^{-} \rightarrow H_{2}(g)$$



$$E_{red}^{} = \frac{E_{red}^{^{\circ}} - \frac{0.0591}{2} log \frac{P_{H_2}^{}}{\left(H^{^{+}}\right)^2}$$

$$H_2(g) \rightarrow 2H_{aq}^+ + 2e^-$$

$$E_{oxd} = E_{oxd}^{\circ} - \frac{0.0591}{2} log \frac{\left(H^{+}\right)^{2}}{P_{H_{2}}}$$

E⁰ of SHF is assumed to be zero at all temperature.

BIOLOGY-I SECTION-A

Q.101 (1)

New NCERT Pg. No. 14



Insect-pollinated flowers are typically large, colorful, and fragrant, and produce nectar to

attract insects. However, options (a) small-sized flowers and (b) non-sticky pollen grains are not characteristic of insect-pollinated flowers, as these traits are more typical of wind-pollinated flowers.

Q.102 (3)

New NCERT Pg. No. 9



Wheat typically has only one ovule per ovary, making this statement

incorrect. The other options are correctly matched:

- Papaver has a multicarpellary syncarpous gynoecium.
- Michelia has a multicarpellary apocarpous gynoecium.
- Mango has a single ovule in an ovary.

Q.103 (3)

New NCERT Pg. No. 15, 16



The pistil can recognize whether pollen is compatible or incompatible. When

incompatible pollen lands on the stigma, the pistil rejects it through various mechanisms. This statement is incorrect. The other statements are correct:

- Pollination does not guarantee the transfer of the right type of pollen.
- Pollen from the wrong species or from the same plant can land on the stigma.
- If the pollen is compatible, the pistil promotes postpollination events.

Q.104 (2)

New NCERT Pg. No. 17



The correct sequence of steps in artificial hybridization is:

1. Selection of parent plant.

- 2. Emasculation (removal of stamens in bisexual flowers to prevent self-pollination).
- 3. Bagging (covering the flower to prevent contamination by unwanted pollen).
- 4. Pollen dusting (introducing desired pollen).
- 5. Rebagging to protect the flower from further contamination.

Q.105 (3)

New NCERT Pg. No. 5

The typical angiosperm anther is dithecous, meaning it has two



thecae, each containing two microsporangia, for a total of four microsporangia. However, stating that there are "four in each lobe" is incorrect. There are two in each lobe.

Q.106 (2)

New NCERT Pg. No. 5

• The endothecium is not responsible for nourishing pollen grains. Its role is



in the dehiscence of the anther to release pollen. The tapetum is the layer that nourishes developing pollen grains.

- The vegetative cell is larger than the generative cell in pollen grains.
- The intine is made up of cellulose and pectin.
- The outer layer of pollen, exine, is composed of sporopollenin.

Q.107 (2)

New NCERT Pg. No. 19

• Statement-I: The endosperm provides nourishment to the developing

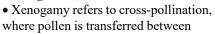


embryo, which is true for many plants, including castor. • Statement-II: In castor, the endosperm is not completely consumed by the embryo and remains in the seed as a source of food after germination. Thus,

Q.108 (4)

New NCERT Pg. No. 7, 8, 12

this statement is incorrect.





different plants. Self-pollination occurs within the same plant and is termed autogamy or geitonogamy, making this pair mismatched.

- Storage of pollen grains at -196°C is correct for cryopreservation.
- Carrot grass (Parthenium) causes pollen allergies.
- Chasmogamous flowers have exposed anthers and stigmas.

Q.109 (1)

New NCERT Pg. No. 12

- Statement-I: Cleistogamous flowers are closed and do not open, ensuring autogamy (self-pollination).
- Statement-II: Cleistogamy is disadvantageous because it eliminates the possibility of cross-pollination, which reduces genetic diversity.

Q.110 (4)

New NCERT Pg. No. 20



The coleoptile is a hollow, protective sheath that covers the shoot apex and young leaf primordia in monocot plants, helping them emerge from the soil during germination.

Q.111 (3)

New NCERT Pg. No. 12

• **Assertion**: Geitonogamy is genetically similar to autogamy



because pollen is transferred between flowers on the same plant, so the genetic material remains identical -This is true.

• Reason: Geitonogamy does not involve transfer between different plants; it happens within the same plant, making the reason false.

Q.112 (3)

New NCERT Pg. No. 18

The correct developmental sequence in the embryo is:



B. Proembryo: The earliest stage after fertilization.

A. Globular stage: The embryo begins to take shape.

C. Heart-shaped stage: The embryo further differentiates.

D. Mature embryo: The final stage before seed development.

0.113 (3)

New NCERT Pg. No. 5



- Statement-I: Cells of the tapetum are rich in cytoplasm and often multinucleated, not single-nucleated.
- Statement-II: The tapetum is indeed the innermost layer of the microsporangium and plays a crucial role in nourishing developing pollen grains.

Q.114 (3)

New NCERT Pg. No. 11

The female gametophyte (embryo sac) in angiosperms typically consists of:



- One egg cell.
- Two synergids (assist in fertilization).
- Three antipodal cells.
- One central cell (with two polar nuclei, which fuse with a sperm nucleus to form the endosperm).

Q.115 (2)

New NCERT Pg. No. 27

The scrotum helps in maintaining the low temperature of the testes



(2-2.5°C lower than the normal internal body temperature) necessary for spermatogenesis.

Q.116

New NCERT Pg. No. 32

Development of corpus luteum takes place during luteal (secretory) phase and there is increase in secretion of progesterone and estrogen (ovarian hormones).



Q.117 (4)

New NCERT Pg. No. 27

The male accessory ducts help in storage, nourishment and transportation of sperms and include:



Rete testis, vasa efferentia, epididymis and vas deferens.

O.118 (2)

New NCERT Pg. No. 27

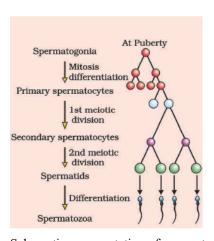
Ejaculatory duct is formed by duct of sominal vesicle and vas deferens.



Q.119 (3)

New NCERT Pg. No. 33





Schematic representation of spermatogenesis

Q.120 (3)

New NCERT Pg. No. 30

Cervical canal + vagina = birth canal



Q.121 (3)

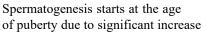
New NCERT Pg. No. 37

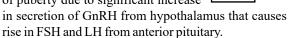
hCG, hPL, relaxin are produced in women only during pregnancy.



Q.122 (2)

New NCERT Pg. No. 31







Q.123 (4)

New NCERT Pg. No. 38

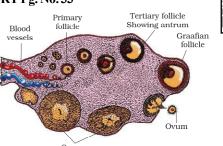


The milk produced during the initial few days of lactation is

called colostrum which contain several antibodies absolutely essential to develop resistance for the new born babies.

Q.124 (2)

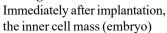
New NCERT Pg. No. 33

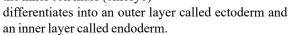


Diagrammatic section view of ovary

Q.125 (1)

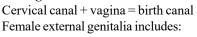
New NCERT Pg. No. 37







New NCERT Pg. No. 30



Mons pubis, labia majora, labia minora, hymen and clitoris.



New NCERT Pg. No. 32

The middle piece of human sperm possesses numerous mitochondria, which produce energy for the movement tail.



Q.128 (2)

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.



Q.129 (1)

New NCERT Pg. No. 44

In copper-releasing IUDs, copper ions released suppress sperm motility and the fertilising capacity of sperms.



Q.130 (3)

New NCERT Pg. No. 48

In vitro fertilisation is done outside body in almost similar conditions as that in the body.



Q.131 (3)

New NCERT Pg. No. 45

Except for hepatitis-B, genital herpes and HIV infections, other diseases are completely curable if detected early and treated properly.



Q.132 (3)

New NCERT Pg. No. 45

Tubectomy is a surgical method, also called sterilisation, in which a small part of the fallopian tube is removed, tied up.



Q.133 (4)

New NCERT Pg. No. 45

In vasectomy, a small part of the vas deferens is removed or tied up, thereby blocking gamete transport and thereby prevents conception.



O.134 (4)

New NCERT Pg. No. 46

Female foeticide is not a ground for MTP in India.



Q.135 (1)

New NCERT Pg. No. 48

Transfer of an ovum collected from a donor into the fallopian tube of



another female who cannot produce one, but can provide suitable environment for fertilisation and further development is GIFT.

It stands for gamete intra-fallopian transfer.

SECTION-B

Q.136 (4)

New NCERT Pg. No. 23

Producing hybrid seeds is costly and requires significant effort



due to manual hybridization, making it expensive for farmers. However, hybrid seeds are widely used because they offer better yields. The other statements are correct.

Q.137 (3)

New NCERT Pg. No. 18

The secondary nucleus is diploid (2n) because it forms from the fusion



of two polar nuclei in the central cell of the embryo sac. The other structures, like antipodals, synergids, and gametes, are haploid (n).

Q.138 (3)

New NCERT Pg. No. 22

This statement is false. Orchids and some parasitic plants like Orobanche



and Striga produce a large number of tiny seeds in each fruit, not just one.

O.139 (1)

New NCERT Pg. No. 11

The filiform apparatus is present in the synergids at the micropylar end of the embryo sac. It guides the pollen tube toward the egg for fertilization.



Synergids having special cellular thickenings at the micropylar tip called filiform apparatus, which play an important role in guiding the pollen tubes into the synergid. Antipodal cells are present at the chalazal end in the mature embryo sac.

Q.140 (4)

New NCERT Pg. No. 20

The remnant of nucellus is persistent in seeds of plants like castor and sunflower and is known as perisperm.



Q.141 (3)

New NCERT Pg. No. 28

The secretions from accessory glands of male composes seminal plasma which is rich in fructose, calcium and certain enzymes but not s perms. Seminal plasma + sperms = Semen



New NCERT Pg. No. 28

The ovarian stroma is divided into two zones – a peripheral cortex and an inner medulla.



O.143 (1)

New NCERT Pg. No. 37

The chorionic villi and maternal uterine tissue become interdigitated



to form structural and functional unit between developing embryo (foetus) and maternal body called placenta.

O.144

NCERT Pg. No. 30

The endometrium undergoes cyclical changes during



menstrual cycle while myometrium exhibits strong contractions during delivery of the baby. The external thin membranous layer of wall of uterus is perimetrium.

Q.145 (2)

New NCERT Pg. No. 33

Secondary spermatocytes → Haploid, n, 23 chromsomes Ootid → Haploid, n, 23 chromosomes Secondary oocyte → Haploid, n, 23 chromosomes Spermatogonium → Diploid, 2n, 46 chromosomes



New NCERT Pg. No. 43

Saheli is non-steroidal preparation. It is selective estrogen receptor modulator.



Q.147 (3)

New NCERT Pg. No. 44

Intra-uterine devices are inserted by doctors or expert nurses in the uterus through vagina.



Q.148 (3)

New NCERT Pg. No. 46

MTPs are considered relatively safe during the first trimester, i.e., up to 12 weeks of pregnancy.



Second trimester abortions are much more riskier.

Q.149 (3)

New NCERT Pg. No. 43

An ideal contraceptive should be user friendly, easily available,



effective and reversible with no or least side-effects. It also should in no way interfere with the sexual drive, desire and/or the sexual act of the user.

Q.150 (1)

New NCERT Pg. No. 46

MTPs were being used for illegal female foeticide, therefore, GOI legalised MTP in 1971.



BIOLOGY-II SECTION-A

Q.151 (2)

New NCERT Pg. No. 13

Zostera is strictly water-pollinated (hydrophily), In Zostera, pollen



grains are long and thread-like, allowing them to easily float and reach the female flower for fertilization. The other options are incorrect:

- Corn cob (1) is wind-pollinated.
- Yucca (3) involves pollination by moths.
- Water lily (4) is primarily insect-pollinated.

Q.152 (4)

New NCERT Pg. No. 18

In angiosperms, the zygote is diploid (2n) as it forms from



the fusion of haploid (n) male and female gametes. The primary endosperm nucleus is triploid (3n) because it forms from the fusion of one sperm nucleus with two polar nuclei in the central cell of the embryo sac.

Q.153 (3)

New NCERT Pg. No. 7

In the given figure, part A likely represents a vegetative cell,



which typically has an irregularly shaped nucleus. Part B is the generative cell, which is spindle-shaped and facilitates the transport of sperm cells to the ovule for fertilization.

Q.154 (2)

New NCERT Pg. No. 20

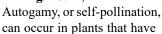
Mango is a true fruit (drupe), developing from a monocarpellary



superior ovary. Cashew nut, Strawberry and apple develop from parts of the flower other than the ovary therefore are false fruits.

Q.155 (1)

New NCERT Pg. No. 11, 12





bisexual flowers (flowers with both male and female reproductive organs) or cleistogamous flowers (flowers that do not open, ensuring self-pollination). Dioecious plants and self-incompatible plants cannot undergo autogamy.

Q.156 (3)

New NCERT Pg. No. 20

In pea seeds, the endosperm is completely consumed during



embryo development, leaving no residual endosperm. In contrast, seeds like maize, barley, and castor retain some endosperm after seed maturation, providing nutrition during germination.

Q.157 (1)

New NCERT Pg. No. 15

• Assertion: A papaya plant prevents both autogamy and geitonogamy -



This is true because papaya plants are dioecious.

• Reason: Papaya plants have either male or female flowers but not both, thus preventing both self-pollination (autogamy) and pollination between flowers on the same plant (geitonogamy).

Q.158 (4)

New NCERT Pg. No. 6

Microsporogenesis refers to the formation of microspores (pollen grains) by the meiotic division of a pollen mother cell.



O.159 (1)

New NCERT Pg. No. 17

In artificial hybridization, emasculation (removal of stamens)



is done to prevent self-pollination in bisexual flowers (flowers containing both male and female reproductive organs). This ensures that only the desired pollen from another plant fertilizes the female plant.

Q.160 (1)

New NCERT Pg. No. 7

Pollen grains are about 25-50 µm in diameter and are well-preserved due



to the presence of sporopollenin, a tough, resistant substance in their outer wall. The other statements are incorrect:

- Pollen grains have a double-layered wall (not single).
- Intine does not lack cellulose, and germ pores are present for pollen tube formation.

Q.161 (2)

New NCERT Pg. No. 9

The hilum represents the junction where the ovule attaches to the



funicle, the stalk that connects the ovule to the ovary wall.

Q.162 (4)

New NCERT Pg. No. 18

In angiosperms, the pollen tube releases two male gametes into



the cytoplasm of the synergids, which are cells located near the egg cell in the embryo sac. One male gamete fertilizes the egg cell (forming the zygote), and the other fuses with the central cell (forming the primary endosperm nucleus).

O.163 (4)

New NCERT Pg. No. 13, 14

This statement is incorrect. Insects. especially bees, are among the most effective pollinating agents, facilitating the transfer of pollen between flowers.



Q.164 (3)

New NCERT Pg. No. 19

In the given figure, A represents the coleorhiza, a protective sheath covering the root, and B represents the Epiblast.



Q.165 (3)

New NCERT Pg. No. 37

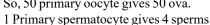
Placenta facilitates the supply of oxygen and nutrients to the embryo and also removal of carbon dioxide and excretory waste materials produced by the embryo.

Placenta is structural and functional unit between developing embryo and maternal body.

O.166 (4)

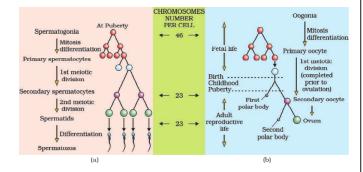
New NCERT Pg. No. 33

1 Primary oocyte gives one ova. So, 50 primary oocyte gives 50 ova.



So, 50 primary spermatocyte gives $50 \times 4 = 200$ sperms





Q.167 (1)

New NCERT Pg. No. 38

Embryo's heart is formed → First month after pregnancy



foetus develops limbs and digits \rightarrow By end of 2^{nd} month Limbs and external genital developed \rightarrow By end of 3^{rd} month Eyelids separate, eye lashes are formed \rightarrow by end of 2nd trimester

Q.168 (4)

New NCERT Pg. No. 27

Correct pathway of transport of sperms Seminiferous tubule \rightarrow Rete testis \rightarrow



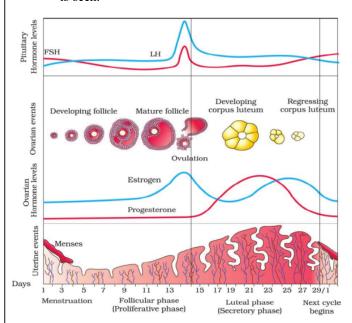
Vasa efferentia \rightarrow Epididymis \rightarrow Vas deferens \rightarrow Ejaculatory duct → Urethra → Urethral meatus

0.169

New NCERT Pg. No. 34

In secretory (luteal) phase of menstrual cycle, peak of progesterone is seen.

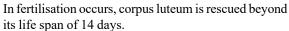




Q.170 (3)

NCERT Pg. No. 34, 35

Changes in ovary and uterus are induced by changes in levels of ovarian as well as pituitary hormones.



Q.171 (4)

New NCERT Pg. No. 30

Menopause is permanent cessation of menstrual cycle.



The first menstruation begins at puberty and is called menarche.

Q.172 (2)

New NCERT Pg. No. 34

During follicular phase (day 6 to Day 13 in 28 days menstrual cycle), primary

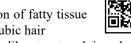


follicles become fully mature Graafian follicle and simultaneously the proliferative phase in uterus regenerates the endometrium.

0.173 (2)

New NCERT Pg. No. 29

Mons pubis \rightarrow Cushion of fatty tissue covered by skin and pubic hair



Clitoris \rightarrow Tiny-finger like structure lying above the urethral opening

Vas deferens → Ascends to the abdomen and loop over the urinary bladder

Seminal vesicles → Male accessory gland secretes seminal plasma

Q.174 (3)

New NCERT Pg. No. 28

Besides secreting steroid hormones, estrogen and progesterone, ovaries also produces ova/egg.



Q.175 (4)

New NCERT Pg. No. 31

the spermatides are transformed into spermatozoa (sperms) by the



process called spermiogenesis after spermiogenesis, sperm head become embedded in the sertoli cells and are finally released from the seminiferus tubules by the process called spermiation.

Q.176 (2)

New NCERT Pg. No. 31

Antrum is a crescent shaped fluid filled cavity present in tertiary follicle.

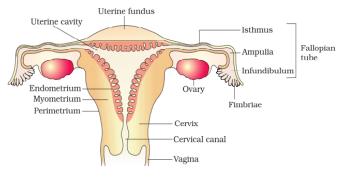


Q.177 (2)

New NCERT Pg. No. 29

Ampulla is wider part of oviduct.





Q.178 (1)

New NCERT Pg. No. 35

At the mid of menstrual cycle, LH surge takes place which leads to rupturing of graafian follicle.



Q.179 (4)

New NCERT Pg. No. 44

Cervical caps, diaphragms and vaults cannot prevent spreading of STIs.



Q.180 (1)

New NCERT Pg. No. 42

Encouraging sex-education in schools can help in maintaining reproductive healthy society.



Q.181 (3)

New NCERT Pg. No. 45

LNG-20 is a hormone – releasing IUD and implants have much longer effective period.



Q.182 (4)

New NCERT Pg. No. 45

Multiload-375 is a copper releasing Intra-uterine device.



Q.183 (3)

New NCERT Pg. No. 44

Periodic abstinence is a method in which couples avoid or abstain from coitus from day 10 to 17 of the menstrual cycle when ovulation could be expected.



O.184 (4)

New NCERT Pg. No. 43

Population growth occurs when there is increase in number of people in reproducible age group.



Q.185 (1)

New NCERT Pg. No. 42

Amniocentesis is a pre-natal diagnostic technique for checking genetic and



chromosomal abnormalities in developing foetus. It is being misused to determine sex of unborn foetus and for female foeticide.

SECTION-B

Q.186 (4)

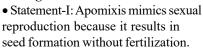
New NCERT Pg. No. 7

In about 60% of angiosperms, pollination takes place when the pollen grain is in the 2-celled stage: a vegetative cell and a generative cell. The generative cell divides later to form two male gametes.



Q.187 (1)

New NCERT Pg. No. 22





• Statement-II: In some species, a diploid egg cell is formed without meiosis (reduction division) and develops into an embryo without fertilization.



Q.188 (2)

New NCERT Pg. No. 8

• Statement-I: Pollen grain viability is affected by temperature and humidity.



• Statement-II: Pollen grains in Rosaceae and Leguminoseae families lose viability in few months.

O.189 (4)

New NCERT Pg. No. 18

The ovules develop into seeds after fertilization, not into embryo sacs.



The embryo sac is formed before fertilization and contains the female gametophyte. The other statements are correct:

- The ovary develops into a fruit.
- The zygote develops into an embryo.
- The central cell develops into the endosperm.

O.190 (4)

New NCERT Pg. No. 9

In angiosperms, the nucellus is the mass of cells inside the ovule that surrounds



the embryo sac. It provides nourishment to the developing embryo and is enclosed by the integuments.

Q.191 (4)

New NCERT Pg. No. 28

The secretions of bulbourethral (cowper's) glands helps in the lubrication of the penis.



Q.192 (2)

New NCERT Pg. No. 30

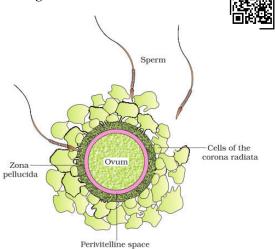
In uterus,

Outer layer → Perimetrium Middle layer \rightarrow Myometrium Inner layer → Endometrium



Q.193 (1)

New NCERT Pg. No. 35



Ovum surrounded by few sperms

Q.194 (2)

New NCERT Pg. No. 35

During fertilisation, a sperm comes in contact with the zona pellucida layer of the ovum and induces changes in the membrane

that blocks the entry of additional sperms.



Q.195 (3)

New NCERT Pg. No. 35

The corpus luteum secretes large amounts of progesterone which is essential for maintenance of the endometrium.



Q.196 (3)

New NCERT Pg. No. 44

Condoms are used as barrier methods and prevents physical meeting of ovum and sperm.



0.197 (4)

New NCERT Pg. No. 43

Grave's disease is a hormonal disorder due to hyper-thyroidism. It is not a genetic or chromosomal disorder.



Q.198 (3)

New NCERT Pg. No. 44

Lactational amenorrhea is absence of menstruation during lactation.



Q.199 (4)

New NCERT Pg. No. 48

In ICSI, intra cytoplasmic sperm injection, sperm is directly injected into the ovum.



Q.200 (2)

New NCERT Pg. No. 44

Lippes loop → Nn-medicated IUD LNG-20 → Hormone releasing IUD

