ANSWER KEY
NEET (FINAL TRACK)
PART TEST-01 (XI)

PHYSICS

Q.1 (1)	**Q.2** (4)	**Q.3 (2)**	**Q.4 (4)**	**Q.5** (2)	**Q.6** (3)	**Q.7** (4)	**Q.8** (2)	**Q.9** (1)	**Q.10** (2)
Q.11 (3)	**Q.12** (3)	**Q.13** (4)	**Q.14** (4)	**Q.15** (4)	**Q.16** (3)	**Q.17** (1)	**Q.18** (4)	**Q.19** (2)	**Q.20** (2)
Q.21 (3)	**Q.22** (3)	**Q.23** (1)	**Q.24 (3)**	**Q.25** (1)	**Q.26** (2)	**Q.27** (1)	**Q.28** (1)	**Q.29** (4)	**Q.30** (3)
Q.31 (3)	**Q.32** (2)	**Q.33** (2)	**Q.34** (3)	**Q.35** (4)	**Q.36** (2)	**Q.37** (3)	**Q.38** (3)	**Q.39** (1)	**Q.40** (2)
Q.41 (4)	**Q.42 (3)**	**Q.43** (3)	**Q.44** (2)	**Q.45** (4)	**Q.46** (2)	**Q.47** (3)	**Q.48** (1)	**Q.49** (2)	**Q. 50** (3)

CHEMISTRY

Q.51 (1)	**Q.52** (1)	**Q.53** (4)	**Q.54** (3)	**Q.55** (3)	**Q.56** (1)	**Q.57** (2)	**Q.58** (1)	**Q.59** (2)	**Q.60** (3)
Q.61 (1)	**Q.62** (3)	**Q.63** (3)	**Q.64** (3)	**Q.65** (4)	**Q.66** (1)	**Q.67** (2)	**Q.68** (3)	**Q.69** (1)	**Q.70** (4)
Q.71 (2)	**Q.72** (2)	**Q.73** (2)	**Q.74** (1)	**Q.75** (4)	**Q.76** (2)	**Q.77** (1)	**Q.78** (1)	**Q.79** (1)	**Q.80** (1)
Q.81 (3)	**Q.82 (3)**	**Q.83 (1)**	**Q.84 (4)**	**Q.85** (3)	**Q.86 (4)**	**Q.87 (3)**	**Q.88** (3)	**Q.89** (1)	**Q.90** (1)
Q.91 (3)	**Q.92** (1)	**Q.93** (1)	**Q.94** (2)	**Q.95** (3)	**Q.96** (2)	**Q.97** (3)	**Q.98 (3)**	**Q.99** (1)	**Q.100** (4)

BIOLOGY-I

Q.101 (3)	**Q.102** (4)	**Q.103** (4)	**Q.104** (1)	**Q.105** (3)	**Q.106** (2)	**Q.107** (2)	**Q.108** (3)	**Q.109** (2)	**Q.110** (4)
Q.111 (1)	**Q.112** (1)	**Q.113** (4)	**Q.114** (4)	**Q.115** (2)	**Q.116** (2)	**Q.117** (4)	**Q.118** (1)	**Q.119** (1)	**Q.120** (4)
Q.121 (2)	**Q.122** (4)	**Q.123** (4)	**Q.124** (1)	**Q.125** (4)	**Q.126** (4)	**Q.127** (2)	**Q.128** (4)	**Q.129** (2)	**Q.130** (3)
Q.131 (3)	**Q.132** (2)	**Q.133** (1)	**Q.134** (2)	**Q.135** (4)	**Q.136** (4)	**Q.137** (3)	**Q.138** (4)	**Q.139** (4)	**Q.140** (3)
Q.141 (1)	**Q.142** (2)	**Q.143** (3)	**Q.144** (4)	**Q.145** (2)	**Q.146** (3)	**Q.147** (4)	**Q.148** (4)	**Q.149** (3)	**Q.150** (4)

BIOLOGY-II

Q.151 (2)	**Q.152** (1)	**Q.153** (3)	**Q.154** (2)	**Q.155** (4)	**Q.156** (2)	**Q.157** (2)	**Q.158** (1)	**Q.159** (2)	**Q.160** (4)
Q.161 (3)	**Q.162** (4)	**Q.163** (1)	**Q.164 (2)**	**Q.165** (2)	**Q.166** (1)	**Q.167** (2)	**Q.168** (3)	**Q.169** (4)	**Q.170** (4)
Q.171 (3)	**Q.172** (2)	**Q.173** (3)	**Q.174** (1)	**Q.175** (3)	**Q.176** (3)	**Q.177** (4)	**Q.178** (3)	**Q.179** (4)	**Q.180** (4)
Q.181 (3)	**Q.182** (2)	**Q.183** (1)	**Q.184** (3)	**Q.185** (2)	**Q.186** (3)	**Q.187** (3)	**Q.188** (4)	**Q.189** (4)	**Q.190** (4)
Q.191 (3)	**Q.192** (2)	**Q.193** (2)	**Q.194** (1)	**Q.195** (1)	**Q.196** (2)	**Q.197** (2)	**Q.198** (4)	**Q.199** (1)	**Q.200** (3)

PHYSICS

Q.1 (1)

$$\begin{array}{r} 3.3 \quad (2\text{ s.f.}) \\ +\ 0.01015 \quad (4.\text{ s.f.}) \\ +\ 0.01017 \quad (4.\text{ s.f.}) \\ \hline 3.32032 \longrightarrow \text{round to 2 s.f.} \end{array}$$

$= 3.3$ kg

Q.2 (4)

From principle of homogeneity,

$[y] = [Ax] + [B]$ and $[Cz] = [M^0L^0T^0]$

$\rightarrow [C] = \left[\frac{1}{z}\right]$

Q.3 (2)

Radius of gyration is radius i.e., length

$\therefore$ CGS unit is centimetre (cm).

Q.4 (4)

Parallactic second or parsec is a unit of large distances used by the astronomers to measure large distances outside our solar system.

Light year is the distance travelled by light in one year.

1 astronomical unit is about 150 million kilometers

1 Fermi = 10^{-15} m

Q.5 (2)

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

$[\text{Stress}] = [\text{Young's modulus}] = [ML^{-1}T^{-2}]$

$$\text{Young's modulus} = \frac{\text{Stress}}{\text{Strain}}$$

Speed of light in vacuum, $C = \sqrt{\frac{1}{\mu_0\varepsilon_0}}$

$\Rightarrow [\text{Speed}] = \left[\sqrt{\frac{1}{\mu_0\varepsilon_0}}\right] = [LT^{-1}]$

$[\text{Momentum}] = [MLT^{-1}]$

$$[\text{Planck's constant, h}] = \left[\frac{\text{Energy}}{\text{Frequency}}\right] = \left[\frac{ML^2T^{-2}}{T^{-1}}\right]$$

$= [ML^2T^{-1}]$

Q.6 (3)

[Torque] = $[ML^2T^{-2}]$

[Surface Tension]

$$= \left[\frac{\text{Force}}{\text{Length}}\right] = \left[\frac{MLT^{-2}}{L}\right]$$

$= [MT^{-2}]$

[Impulse] = [Change in linear momentum]

$= [MLT^{-1}]$

$$[\text{Radical acceleration}] = \left[\frac{v^2}{r}\right] = \left[\frac{L^2T^{-2}}{L}\right]$$

$= [M^0L^1T^{-2}]$

Q.7 (4)

20VSD = 16 MSD

$$1\ \text{VSD} = \frac{16}{20}\ \text{MSD} = 0.8\ \text{MSD}$$

L.C = 1MSD – 1 VSD = 1MSD – 0.8 MSD

= 0.2 MSD = 0.2 × 1 mm = 0.2 mm

Q.8 (2)

$\underbrace{0.003}_{\text{Insignificant digits}}\underbrace{270}_{\text{significant digits}}$

Q.9 (1)

$$[\text{Velocity}] = \left[\frac{\text{length}}{\text{time}}\right]$$

Velocity is dependent on both length and time.

Q.10 (2)

Negative acceleration means velocity is decreasing because velocity is positive

$\Rightarrow$ Slope of x–t graph should decrease.

Q.11 (3)

Ratio of distance travelled in each t sec (U = 0) = 1 : 3 : 5

Q.12 (3)

$$\vec{v} = \frac{\text{total displacement}}{\text{total time}}$$

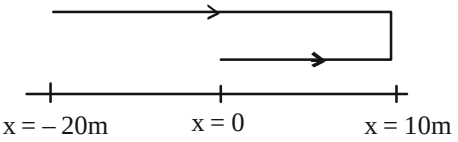
$$\vec{v} = \frac{\left(\frac{1}{2}\times 1\times 12 - \frac{1}{2}\times 3\times 36\right)}{8-4}$$

$$\frac{-48}{8-4} = -12$$

Q.13 (4)

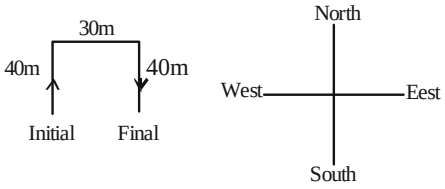
$$V = \frac{5\sqrt{3}}{10\,\text{day}} = \frac{\sqrt{3}}{2}\,\text{m/day}$$

Q.14 (4)



Total distance travelled = 10 + 10 + 20 = 40m

Q.15 (4)



+

$\longrightarrow$ Final displacement = 30m East

Q.16 (3)

$$\text{average speed} = \frac{\text{distance}}{\text{time}} \Rightarrow \frac{2\pi r}{2\pi} = 10\,\text{m/s}$$

Q.17 (1)

$$S_{nth} = u + \frac{1}{2}(2n-1)$$

$$120 = 0 + \frac{a}{2}(16-1)$$

$$\frac{240}{15} = a \Rightarrow a = \frac{240}{15} = 16\,\text{m/s}^2$$

Q.18 (4)

$$\left.\begin{aligned} &x = at^3 \\ &v = \frac{dx}{dt} = A(3t^2) \\ &a = 3A(2t) \\ &\quad = 6At \end{aligned}\right\} \begin{aligned} &v(t=0) = 0 \\ &a(t=0) = 0 \end{aligned}$$

Q.19 (2)

distance $\geq$ displacement

distance may or may not be zero.

Q.20 (2)

Area under a – t graph gives change in velocity

$$= \frac{1}{2}\times 15\times 10 = 75\ \text{m/s}$$

$\Rightarrow \Delta\vec{V} = \vec{V}_f - \vec{V}_i = 75\ m/s$

$\Rightarrow V_f - 0 = 75\ m/s$

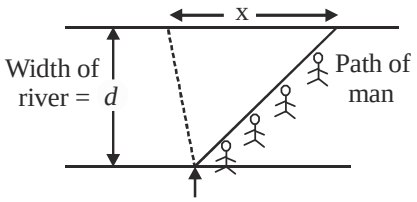
$\Rightarrow V_f = 75\ m/s$

Q.21 (3)

$t = \dfrac{S_{rel}}{V_{rel}} = \dfrac{120}{10} = 12\ s$

Distance covered by jeep = 30 × 12 = 360 m

Q.22 (3)



x = drift in the direction of river flow

$V_y = \dfrac{d}{t} = \dfrac{400}{t}$

$\Rightarrow t = \dfrac{400}{50} = 8s$

$x = V_x t = (40)(8) = 320\ m$

Net displacement = $\sqrt{x^2 + y^2} = \sqrt{(320)^2 + (400)^2}$

$= 80\sqrt{16+25} = 80\sqrt{41}\ m$

Q.23 (1)

$\vec{V}_R = x\hat{i} - y\hat{j}$

Case-I $\vec{V}_{RM} = \left(x\hat{i} - y\hat{j}\right) - 5\hat{i}$

$= (x-5)\hat{i} - y\hat{j}$

Girl observes rain falling vertically down

$x - 5 = 0 \Rightarrow x = 5$

Case-II $\vec{V}_{RM} = \left(x\hat{i} - y\hat{j}\right) - 10\hat{j}$

$= (x-10)i - y\hat{j} = -5\hat{i} - y\hat{j}$

Now rain appears to meet her at 45°

$y = 5$

so $\vec{V}_R = 5\hat{i} - 5\hat{j}$

$|\vec{V}_R| = 5\sqrt{2}\ ms^{-1}$

Q.24 **(3)**

Range, $R = \dfrac{u^2 \sin 2\theta}{g}$

R_{max} at $\theta = 45° \Rightarrow R_{max} = \dfrac{u^2}{g} = 500\ m$

Maximum height, $H_{max} = \dfrac{u^2 \sin^2\theta}{2g}$

$= \dfrac{u^2(\sin^2 45°)}{2g}$

$= \dfrac{(500)}{2} \times \left(\dfrac{1}{\sqrt{2}}\right)^2 = \dfrac{500}{4} = 125\ m$

Q.25 (1)

Range = $\dfrac{u^2 \sin^2\theta}{g}$

$\Rightarrow \dfrac{R_1}{R_2} = \dfrac{\sin 2(37°)}{\sin 2(45°)} = 2 \times \dfrac{3}{5} \times \dfrac{4}{5}$

$\Rightarrow \dfrac{R}{R_2} = \dfrac{24}{25} \Rightarrow R_2 = \dfrac{25}{24}R$

Q.26 (2)

$H_1 + H_2 = \dfrac{u^2}{2g}\left(\sin^2\theta + \cos^2\theta\right)$

$= \dfrac{u^2}{2g} = \dfrac{(20)^2}{2(10)} = 20\ m$

Q.27 (1)

$\tan 37° = \dfrac{V_y}{V_x} = \dfrac{\sqrt{2gh}}{10}$

$\dfrac{3}{4} = \dfrac{\sqrt{2gh}}{10}$

$\sqrt{2gh} = \dfrac{30}{4} = \dfrac{15}{2}$

$2 \times 10h = \dfrac{15}{2} \times \dfrac{15}{2}$

$h = 2.81\ m$

Q.28 (1)

$H \rightarrow$ same $\Rightarrow U_y \rightarrow$ same

$R = \dfrac{2U_x U_y}{g} \Rightarrow R \propto U_x$

$R_B > R_A \Rightarrow U_{XB} > U_{XA}$

$\Rightarrow U_B > U_A$

Q.29 (4)

Comparing from standard equation of trajectory,

$y = x\tan\theta - \dfrac{gx^2}{2u^2\cos^2\theta}$

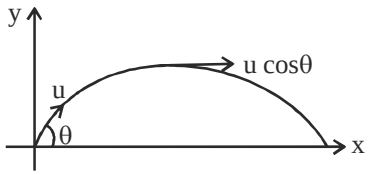
$\tan\theta = \frac{1}{\sqrt{3}} \Rightarrow \theta = 30°$

$\frac{g}{2u^2\cos^2 30°} = \frac{1}{60} \Rightarrow u^2 = \frac{g\times 60\times 4}{2\times 3}$

$\Rightarrow u^2 = 400$

$\Rightarrow u = 20$ m/s

Q.30 (3)



Given, $u\cos\theta = \frac{u}{2} \quad \Rightarrow \theta = 60°$

$\frac{\text{Range}}{H_{max}} = \frac{\frac{u^2\sin 2\theta}{g}}{\frac{u^2\sin^2\theta}{2g}} = \frac{\sin 2\theta}{\sin^2\theta}\times 2$

$= \frac{\sin 120°\times 2}{\sin 60°\times\sin 60°} = \frac{2\times 2}{\sqrt{3}} = \frac{4}{\sqrt{3}}$

Q.31 (3)

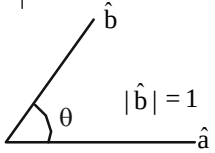
Direction $\Rightarrow \frac{-4\hat{i}+3\hat{j}}{|-4\hat{i}+3\hat{j}|} = \frac{-4\hat{i}+3\hat{j}}{5}$

$\vec{v} = 10\ \text{m/s}\left(\frac{-4\hat{i}+3\hat{j}}{5}\right)$

$= (-8\hat{i}+6\hat{j})$ m/s

Q.32 (2)

$|\hat{a}+\hat{b}| = \sqrt{a^2+b^2+2ab\cos\theta} = \sqrt{3}$



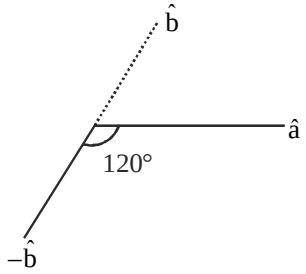
where $|\hat{a}| = 1$

θ = Angle between $\hat{a}$ and $\hat{b}$

$\Rightarrow 1+1+2\cos\theta = 3 \quad \Rightarrow \cos\theta = \frac{1}{2} \Rightarrow \theta = 60°$

for $|\hat{a}-\hat{b}| = \sqrt{a^2+b^2+2ab\cos 120°}$

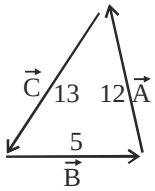
$= \sqrt{1+1+2\left(\frac{-1}{2}\right)} = 1$



Q.33 (2)

$5^2 + 12^2 = 13^2$

$A^2 + B^2 = C^2$



Q.34 (3)

In uniform circular motion acceleration vector is opposite to position vector.

Q.35 (4)

Centripetal accelaration $= \frac{v^2}{R} = R\omega^2$

and $\omega = \frac{2\pi}{T} = \frac{2\pi}{0.2\pi} = 10\,\text{rad/s}$

$\Rightarrow a_C = \frac{5}{100}\times(10)^2 = 5\,\text{m/s}^2$

SECTION-B

Q.36 (2)

Mean time period

$= \frac{1.9+2.0+2.1}{3} = 2.0\text{s}$

Absolute error, $e_1 = (1.9-2) = 0.1$

$e_2 = (2-2) = 0$

$e_3 = |2.1-2| = 0.1$

Mean absolute error $= \frac{e_1+e_2+e_3}{3} = \frac{0.1+0+0.1}{3}$

$= \frac{0.2}{3}$

Relative error, $\frac{\text{error}}{\text{mean value}} = \frac{0.1}{2} = 0.05$

Percentage error = Relative error × 100 = 5%

Q.37 (3)

$$\frac{dX}{X}=\frac{2d\alpha}{\alpha}+\frac{3d\beta}{\beta}+\frac{1}{2}\frac{d\rho}{\rho}+\frac{3}{2}\frac{d\gamma}{\gamma}$$

$$\Rightarrow \frac{dX}{X}\times 100=\left(2\frac{d\alpha}{\alpha}+\frac{3d\beta}{\beta}+\frac{1}{2}\frac{d\rho}{\rho}+\frac{3}{2}\frac{d\gamma}{\gamma}\right)\times 100$$

$$=2\left(\frac{1}{2}\right)+3\left(\frac{1}{3}\right)+\frac{1}{2}(2)+\frac{3}{2}\left(\frac{1}{3}\right)$$

$$=1+1+1+\frac{1}{2}=\frac{7}{2}\%$$

Q.38 (3)

[Young's modulus]
$=[ML^{-1}T^{-2}]=[V^aM^bT^c]$
$\Rightarrow [ML^{-1}T^{-2}]=[(LT^{-1})^aM^bT^c]$
$\Rightarrow [ML^{-1}T^{-2}]=[M^bL^aT^{-a+c}]$
Comparing, $a=-1, b=1, -a+c=-2$
$\Rightarrow c+1=-2$
$\Rightarrow c=-3$
$\Rightarrow [Y]=[V^{-1}M^1T^{-3}]$

Q.39 (1)

$$[P]=\frac{\left[ax^2\right]}{\left[b-2t\right]}\Rightarrow [b]=[M^0L^0T^1]$$

$$\text{and } [P]=[ML^2T^{-3}]=\left[\frac{ax^2}{T}\right]=\left[\frac{aL^2}{T}\right]$$

$\Rightarrow [a]=[ML^0T^{-2}]$
$[ab]=[M^0L^0T^1][M^1L^0T^{-2}]$
$[M^1L^0T^{-1}]$

Q.40 (2)

Work $\rightarrow [ML^2T^{-2}]$
Force $\rightarrow [MLT^{-2}]$
Energy $\rightarrow [ML^2T^{-2}]$
Ratio of change in linear momentum $\rightarrow [MLT^{-2}]$
Acceleration $\rightarrow [LT^{-2}]$

Q.41 (4)

$$S_1=\frac{1}{2}\times 10\times (2)^2=20\text{m}$$

$$S_2=\frac{1}{2}\times 10\times (2)^2=20\text{m}$$

Height from ground = (H – 40)m

Q.42 **(3)**

$$\text{Acceleration, } a=\frac{vdv}{dx}=15\times\frac{20-10}{4-2}$$

$$=15\times\frac{10}{2}=75\text{ m/s}^{2|}$$

Q.43 (3)

$$a=v\frac{dv}{dx}=5x\times 5=25x, a_{at,x=2}=50\text{ m/s}^2$$

Q.44 (2)

$$S(0\text{ to }2s)=\frac{1}{2}at^2=\frac{1}{2}a(2)^2=2a=x$$

$$S(0\text{ to }4s)=\frac{1}{2}a(4)^2=8a$$

$\Rightarrow S(2\text{ to }4s)=S(0\text{ to }4s)-S(0\text{ to }2s)$
$=8a-2a=6a=y$
$\Rightarrow y=3x$

Q.45 (4)

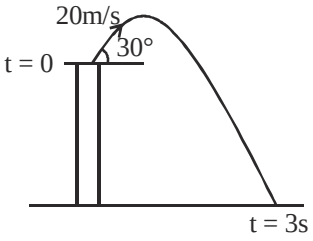
$$\vec{v}=a\hat{i}+b\hat{j}\Rightarrow U_x=a \;\&\; H_{max}=\frac{U_y^2}{2g}=\frac{b^2}{2g}$$

$$\&\, U_y=b \qquad R=\frac{2U_xU_y}{g}=\frac{2ab}{g}$$

$\therefore H_{max}=2R$

$$\frac{b^2}{2g}=2\left(\frac{2ab}{g}\right)\qquad\Rightarrow b=8a$$

Q.46 (2)



$u_y=20\sin 30°=10$ m/s

$$-h=u_gt-\frac{1}{2}gt^2$$

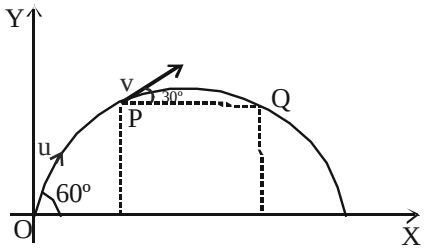
$$-h=10\times 3-\frac{1}{2}\times 10\times 9$$

$-h=30-45=-15$
$\Rightarrow h=15$m

Q.47 (3)

The time of flight of a projectile is indeed influenced by its initial velocity and the angle of projection.
The time of flight is determined by the vertical motion of the projectile.
So, the correct answer is:
Assertion (A) is true, and **Reason (R)** is false.

Q.48 (1)



$u\cos60° = V\cos30°$

$\Rightarrow 18\sqrt{3}\times\frac{1}{2} = V\frac{\sqrt{3}}{2}$

$\Rightarrow V = 18$ m/s

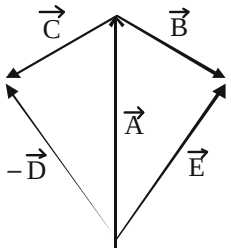
Time of flight for P or Q = $\frac{2V\sin30°}{g}$

(consider initial position at P)

$\Rightarrow T_{PQ} = \frac{2\times18}{10}\times\frac{1}{2} = 1.8s$

Q.49 (2)

$\vec{C} - \vec{D} + \vec{E} = \vec{B}$



Q. 50 (3)

Radial acceleration, $\alpha_C = \frac{V^2}{R} = \frac{\alpha^2t^4}{R}$

$\Rightarrow a_c(t=2) = \frac{\alpha^2(2)^4}{2}$

$a_c = 8\alpha^2$

Tangential acceleration, $a_t = \frac{d(\vec{v})}{dt} = \frac{d(speed)}{dt}$

$\Rightarrow \alpha_t = 2\alpha t$

$\Rightarrow \alpha_t$ (at t = 2) $= 4\alpha$

Ratio $\frac{a_c}{a_t} = \frac{8\alpha^2}{4\alpha} = 2\alpha$

CHEMISTRY

SECTION-A

Q.51 **(1)**

Volume of N_2 gas in 5 litre of air = $\frac{78}{100}\times5 = 3.9$ L

No of mlecule = $\frac{3.9}{22.4}\times N_A$

No of atoms of N = $\frac{3.9}{22.4}\times N_A\times2 = 0.35\,N_A$

Q.52 (1)

Minimum molecular mass

$= \frac{\text{atomic mass}}{\%\,\text{element}}\times100$

$= \frac{16}{8}\times100 = 200$

Q.53 (4)

Molarity of concentration H_2SO_4 solution

$(M) = \frac{\%\times d\times10}{GMM}$

$M = \frac{98\times1.8\times10}{98} = 18$ M

$M_1V_1 = M_2V_2$

$18\times V_1 = 0.2\times500$

$V_1 = 5.55$ ml

Q.54 (3)

Element	m	a	$\frac{m}{a}$	mole ratio	Whole no
C	6	12	0.5	$\frac{0.5}{0.25}=2$	2
H	1	1	1	$\frac{1}{0.25}=4$	4
O	4	16	0.25	$\frac{0.25}{0.25}=1$	1

Empirical formula is C_2H_4O

Empirical formula mass = 2 × 12 + 4 + 16 = 44

$n = \frac{\text{Molecular mass}}{\text{Empirical mass}} = \frac{88}{44} = 2$

Molecular formula = Empirical formula × n

MF = $(C_2H_4O)\times2$

$= C_4H_8O_2$

Q.55 (3)

No. of electron in 1 O^{2-} = 10

No. of mol of $O^{2-} = 2\times10^{-3}$

No. of $e^- = 2\times10^{-3}\times10\times N_A$

$= 2\,0\times10^{-3}\times6.02\times10^{23}$

$= 1.2\times10^{22}$

Q.56 (1)

Molecular formula of cyclobutane is C_4H_8

Molecular mass of cyclobutane = 56

Empirical formula represents simplest ratio of atoms of element present in a

molecule of compound so empirical formula of cyclobutane is CH_2 and therefore empirical formula mass of cyclobutane is 14 which is $\frac{1}{4^{th}}$ of molecular mass of cyclobutane (56).

Q.57 (2)
Molecular formula of sucrose is $C_{12}H_{22}O_{11}$
12 mole of carbon present in
= 1 mole sucrose

$\therefore$ 1.8 mole carbon present = $\frac{1.8}{12}$ = 0.15 mole of sucrose

Q.58 (1)
5 molal solution means $n_{solute} = 5$

$n_{solvent} = \frac{1000}{18} = 55.5$

mole fraction of solute = $\frac{5}{55.5+5} = 0.0826$

$= 8.2 \times 10^{-2}$

Q.59 (2)
Average atomic no of

$X = \frac{120\times60+122\times30+119\times10}{100}$

= 120.5

Q.60 (3)
$2H_2(g) + O_2(g) \rightarrow 2H_2O(\ell)$

$\left(\frac{mol}{S.C}\right)_{H_2} = \frac{4/2}{2} = 1$ (S.C –stoichiometric coefficient)

$\left(\frac{mol}{S.C}\right)_{O_2} = \frac{16/32}{1} = 0.5$

Since $\frac{mol}{S.C}$ value of O_2 is lesser so O_2 is limiting reagent.

$\frac{mol\,of\,H_2O\,formed}{2} = \frac{mol\,of\,O_2}{1}$

mol of H_2O formed = 2 × 0.5 = 1mole
mass of H_2O formed = 1 × 18 = 18g.

Q.61 (1)

$m = \frac{1000\times X_B}{(1-X_B)\times M_A}$

$m = \frac{1000\times0.02}{(1-0.02)\times18}$

m = 1.13

Q.62 (3)
4 amu = 1 He atom

$\therefore$ 40 amu = 10 He atoms

Q.63 (3)
According to Dalton's atomic theory atoms of the elements are identical in all respect.

Q.64 (3)
% of N = 100 – 69.5
= 30.5%

Element	(%)	a	$\frac{\%}{a}$	mol ratio	whole no. ratio
N	30.5	14	2.18	$\frac{2.18}{2.18}=1$	1
O	69.5	16	4.34	$\frac{4.34}{2.18}=2$	2

Empirical formula is NO_2.

Q.65 (4)
According to Dalton's atomic theory atoms can neither be created nor be destroyed in a chemical reaction.

Q.66 (1)
Molar volume = 22.4 L
22.4 L CH_4 = 1 mole
5.6 L CH_4 = 0.25 mole
0.25 mole CH_4 = $(6.023 \times 10^{23} \times 0.25)$ molecule
= $(5 \times 6.023 \times 10^{23} \times 0.25)$ atoms
= 7.52×10^{23} atoms

Q.67 (2)
No. of radial node = $n - \ell - 1$
for 2s orbital ; no. of radial node
= 2 – 0 – 1 = 1
& s orbital is speherically symmetrical orbit.

Q.68 (3)
Given λ = 200 pm
= 200×10^{-12} m

Energy (E) = $\frac{hc}{\lambda} = \frac{2\times10^{-25}}{200\times10^{-12}} = 10^{-15}$ J

Q.69 (1)

Energy $\propto \frac{-z^2}{n^2}$

for H-atom $E \propto \frac{-1}{n^2}$

$$\frac{E_4}{E_2} = \frac{-n_2^2}{-n_4^2}$$

$$\frac{E_4}{-328} = \frac{2^2}{4^2}$$

$E_4 = -82\ kJ\ mol^{-1}$

Q.70 (4)

Given uncertainty in position i.e., $\Delta x = 0$

Using Heisenberg uncertainty equation

$$\Delta x \cdot \Delta p \geq \frac{h}{4\pi}$$

$$\Delta p \geq \frac{h}{4\pi \times \Delta x}$$

$$\Delta p = \frac{h}{o} = \infty$$

Q.71 (2)

$2\pi r_n = n\lambda$

$2\pi a_0 n^2 = n\lambda$ (For H-atom $r_n = a_0 n^2$)

$$n = \frac{\lambda}{2\pi a_0}$$

$$n = \frac{8\pi a_0}{2\pi a_0}$$

$n = 4$

Q.72 (2)

$3d_{z^2}$ orbital contains electronic ring due to which electronic density is present in all three axis.

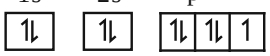
Q.73 (2)

Given show 1 radial nodes so it is 2s orbital.

Q.74 (1)

Electronic configuration of

Fluorine is $1s^2$ $2s^2$ $2p^5$



unpaired electron is present in $2p_z$ orbital so $n = 2, l = 1$ and $m = 0$

Q.75 (4)

Number of spherical node or radial node $= n - l - 1$

For 3p orbital no of radial node $= 3 - 1 - 1 = 1$

Q.76 (2)

Theory fact.

Q.77 (1)

$\Delta E = E_{final} - E_{initial}$

$$E_3 - E_2 = \frac{-R}{3^2} - \left(\frac{-R}{2^2}\right)$$

$$= -R\left(\frac{1}{9} - \frac{1}{4}\right)$$

$$E_4 - E_3 = \frac{-R}{4^2} - \left(\frac{-R}{3^2}\right)$$

$$= -R\left(\frac{1}{16} - \frac{1}{9}\right)$$

$$\frac{E_3 - E_2}{E_4 - E_3} = \frac{-R\left(\frac{-5}{36}\right)}{-R\left(\frac{-7}{16\times 9}\right)}$$

$$= \frac{5\times 16\times 9}{36\times 7} = \frac{20}{7}$$

Q.78 (1)

For $n = 4, l = 2, m = -1$;

One orbital is possible an orbital contains maximum of $2e^-$.

Q.79 (1)

Given $\Delta v = \Delta x$

According to Heisenberg

$$\Delta p \,.\, \Delta x = \frac{h}{4\pi}$$

$$\Delta p \,.\, \Delta v = \frac{h}{4\pi} \quad (\because \Delta x = \Delta V)$$

$$\Delta p \,.\, m\Delta v = \frac{mh}{4\pi}$$

$$\Delta p \,.\, \Delta p = \frac{mh}{4\pi}$$

$$\Delta p = \sqrt{\frac{mh}{4\pi}}$$

$$\Delta p = \frac{1}{2}\sqrt{\frac{mh}{\pi}}$$

Q.80 (1)

Lines of lyman series is

present in Ultraviolet region.

Q.81 (3)

Given m = 4mg = 4×10^{-3} g
= 4×10^{-6} kg

$v = 1800 \frac{km}{h} = \frac{1800 \times 10^3 m}{60 \times 60 s}$

$v = 500\ ms^{-1}$

$\lambda = \frac{h}{mv} = \frac{6.626 \times 10^{-34}}{4 \times 10^{-6} \times 500}$

$\lambda = 3.3 \times 10^{-31}$ m

Q.82 (3)

For $\ell = 2$; possible values of m are –2, –1, 0 + 1, + 2.
So (b) is not possible
For $\ell = 0$; possible value of m = 0; so (c) is not possible
For n = 1, possible value of l = 0; so (d) is not possible

Q.83 (1)

$KE = \frac{hc}{\lambda} - \phi$

$\phi = 2ev = 2 \times 1.6 \times 10^{-19}$ J
$\phi = 3.2 \times 10^{-19}$ J

$\frac{hc}{\lambda} = \frac{2 \times 10^{-25}}{2.2 \times 10^{-7}} = 9.1 \times 10^{-19}$ J

$KE = 9.1 \times 10^{-19} - 3.2 \times 10^{-19}$
$KE = 5.9 \times 10^{-19}$ J

Q.84 **(4)**

Phtelectric effect and black body radiation can be explained by particle nature of electromagnetic radiation.

Q.85 (3)

For the same subshell energy of subshell is inversely proportion to atomic number so the correct order of energy of 2s orbitat is H > Li Na > K.

Q.86 (4)

According to dalton's atomic theory: atoms of different elements have different mass and atom is smallest indivisible particle of matter and atoms neither be created nor be destroyed in any chemical reaction.

Q.87 (3)

$\%\ Strength = \frac{mass\ in\ (g)}{vol\ in\ ml} \times 100$

$= \frac{2}{300} \times 100 = 0.66\ \%$

Q.88 (3)

No. of atoms = no. of mole × atomicity × N_A
28 g N_2 = 1 mol N_2 = $2N_A$ atoms
32 g O_2 = 1 mol O_2 = $2N_A$ atoms

Q.89 (1)

% of M = 100 – 26 = 74%

ratin of mol of metal (m) and O = $\frac{\frac{74}{23}}{\frac{26}{16}} = \frac{2}{1}$

Empirical formula is M_2O

Q.90 (1)

Number of atoms
= no of mole × atomicity × N_A

(1) 4g of $H_2 = \frac{4}{2} \times 2 \times N_A = 4N_A$ atoms

(2) 11.2 L of H_2O(g) at STP

mol = $\frac{11.2}{22.4} = 0.5$, atmicity = 3

Number of atoms = $0.5 \times 3 \times N_A = 1.5\ N_A$ atoms

(3) 54g of Ag

No. of mole = $\frac{54}{108} = 0.5$, atomicity = 1

Number of atoms = $0.5 \times 1 \times N_A = 0.5\ N_A$ atoms

(4) 24g O_3 gas

mol = $\frac{24}{48} = 0.5$, atomicity = 3

Number of atoms = $0.5 \times 3 \times N_A = 1.5\ N_A$ atoms

Q.91 (3)

⇒ Avogadro's law is applicable only at same temperature and pressure not at different temperature and pressure.
⇒ According to Dalton's atomic theory atom is smallest particle
⇒ Law of constant proportion states that a compound always contains fixed proportion of elements by mass.

Q.92 (1)

Molecular formula of ethane is C_2H_6 and empirical formula represent simplest whole number ratio of various elements present in a molecule so empincial formula of ethane is CH_3.

Q.93 (1)

(1) % O in $H_2O = \frac{16}{18} \times 100 = 88.9\%$

(2) % O in $CO_2 = \frac{2\times16}{44} \times 100 = 72.7\%$

(3) % O in $CaCO_3 = \frac{3\times16}{100} \times 100 = 48\%$

(4) % O in $C_2H_5OH = \frac{16}{46} \times 100 = 34.8\%$

Q.94 (2)

Ground state electronic configuration of Zn is $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^{10}$

$\Rightarrow$ For $\ell = 2$, 3d subshell

$\Rightarrow m\ell = 0$ represent 1 orbital of each subshell and there are 7 subshell and total $e^- = 14$

$\Rightarrow$ For $n + \ell = 4$; possible subshells are 4s and 3p

$\Rightarrow$ For $\ell = 1$; represent p subshell = 12 e^- but with

$m_s = +\frac{1}{2} = 6e^-$

Q.95 (3)

Maximum number of electrons in the shell with principal quantum number (n) is equal to $2n^2$.

$$E_n = \frac{2.18\times10^{-18}\times Z^2}{n^2}$$

Q.96 (2)

$$r_n = a_0\frac{n^2}{z}$$

$$(r_2)_{He^+} = a_0 \times \frac{2^2}{2} = 2a_0$$

$$(r_1)_H = a_0 \times \frac{1^2}{1} = a_0$$

$$\frac{(r_2)_{He^+}}{(r_1)_H} = 2$$

$$(r_2)_{He^+} = 2\times(r_1)_H$$

Q.97 (3)

In photoelectric effect the number of photoelectrons ejected is proportional to intensity of light and there is no time lag between the striking of light beam and ejection of electron and for a given metal, there exists a certain minimum frequency of radiation below which effect is not observed.

Q.98 (3)

For 3p orbital, $\ell = 1$ and orbital angular momentum =

$\hbar\sqrt{\ell(\ell+1)}$ $\quad \left[\text{where } \hbar = \frac{h}{2\pi}\right]$

$\hbar\times\sqrt{1(1+1)}$

$= \sqrt{2}\,\hbar$

Q.99 (1)

Energy emitted by bulb = 54 watt = 54 Js^{-1}

Energy of photon

$= \frac{hc}{\lambda} = \frac{6.6\times10^{-34}\,Js\times3\times10^{8}\,ms^{-1}}{330\times10^{-9}\,m}$

$= 6\times10^{-19}$ J

Rate of emission of quanta per second $= \frac{54\,Js^{-1}}{6\times10^{-19}\,J}$

$= 9\times10^{19}\ s^{-1}$

Q.100 (4)

W_0 of Cu = 4.8

Mg = 3.7

Li = 2.42

K = 2.5

BIOLOGY-I
SECTION-A

Q.101 (3)

New NCERT Pg. No. 5, 7, 8

- Statement (i) is correct as systematics include the study of evolutionary relationships between organisms, which is a crucial aspect of classifying and understanding biological diversity.
- Statement (ii) is incorrect because a genus comprises a group of related species, not families.
- Statement (iii) is incorrect since wheat belongs to the order Poales, not Sapindales.
- Statement (iv) is incorrect because families are characterized by various features, including both vegetative and reproductive characteristics.

Q.102 (4)

Old NCERT Pg. No. 4

Growth is commonly understood as an increase in mass and an increase in the number of individuals.

Therefore, the twin characteristics of growth are an increase in mass (A) and an increase in the number of individuals (C).

Q.103 (4)

Old NCERT Pg. No. 4

In bacteria, unicellular algae, and *Amoeba*, reproduction is synonymous with growth.

This means that every time these organisms reproduce (divide), they also grow, as there is no clear distinction between the two processes in these unicellular organisms.

Q.104 (1)

Old NCERT Pg. No. 5

Statement-I is correct as all living organisms, including plants, animals, fungi, and microbes, exhibit metabolism, which is a defining feature of life.

Statement-II is also correct because metabolic reactions can indeed be demonstrated outside the body in a cell-free system. This is the basis of many biochemical experiments where enzymes catalyze reactions in test tubes.

Q.105 (3)

New NCERT Pg. No. 21

The causal agent of bovine spongiform encephalopathy (BSE),
also known as mad cow disease, is a prion, which is an abnormally folded protein that causes neurodegenerative diseases.

Q.106 (2)

New NCERT Pg. No. 17

The classification of fungi into various classes is not based on their mode of nutrition,
but rather on the mode of spore formation, morphology of mycelium, and the types of fruiting bodies.

Q.107 (2)

New NCERT Pg. No. 19, 20

Most plant viruses have single-stranded RNA (ssRNA) as their genetic material, not double-stranded RNA (dsRNA). This makes statement (2) incorrect.

Q.108 (3)

New NCERT Pg. No. 21

In lichens, the algal partner is called the phycobiont, and the fungal partner is called the mycobiont.
These two live together in a symbiotic relationship.

Q.109 (2)

New NCERT Pg. No. 16

The correct matches are:
a(iv): Flagellated protozoans - The parasitic forms cause diseases, such as sleeping sickness,
b(iii): Ciliated protozoans - Aquatic actively moving organisms,
c(i): Sporozoans - Plasmodium, a malarial parasite in humans,
d(ii): Amoeboid protozoans - Silica shells in some forms.

Q.110 (4)

New NCERT Pg. No. 17, 18

Asci are arranged in fruiting bodies called ascocarps in ascomycetes, not basidiocarps.
Basidiocarps are the fruiting bodies of basidiomycetes, making statement (4) incorrect.

Q.111 (1)

New NCERT Pg. No. 15

Under unfavorable conditions, the plasmodium (a multinucleate mass of cytoplasm in slime molds)
differentiates to form fruiting bodies, which then produce spores for reproduction.

Q.112 (1)

New NCERT Pg. No. 32

Selaginella belongs to the class Lycopsida, which includes club mosses and their relatives.

Q.113 (4)

New NCERT Pg. No. 29, 33

In bryophytes, the sporophyte is dependent on the gametophyte for nutrition.
In gymnosperms, the gametophyte is highly reduced and dependent on the sporophyte.

Q.114 (4)

New NCERT Pg. No. 24

Artificial classification and Numerical classification both give equal importance to each character, which is not the case in natural classification systems.

Q.115 (2)

New NCERT Pg. No. 27

Members of Rhodophyceae (red algae) can be found in well-lit surface waters and at great depths in the ocean.
They are commonly called Red algae and store Floridian Starch. Their sexual reproduction is oogamous followed by complex post fertilization events.

Q.116 (2)

New NCERT Pg. No. 24

The assertion that fusion of two gametes dissimilar in size is termed anisogamous is correct, and the reason that fusion between a large non-motile female gamete and a smaller motile male gamete is termed oogamous is also correct but the reason does not correctly explains the assertion.

Q.117 (4)

New NCERT Pg. No. 24

Zoospores are actually motile and have flagella, which allow them to move.
Therefore, the statement that zoospores are non-motile is incorrect.

Q.118 (1)
New NCERT Pg. No. 23
Kingdom Plantae does not include prokaryotic organisms.
It only includes eukaryotic, multicellular, chlorophyll-containing organisms. The prokaryotic photosynthetic organisms are classified under Kingdom Monera (e.g., cyanobacteria).

Q.119 (1)
New NCERT Pg. No. 26
Algin is a phycocolloid obtained from marine brown algae, while carrageen is obtained from marine red algae.

Q.120 (4)
New NCERT Pg. No. 30
Colletotrichum is a genus of fungi, not a moss. The other options (*Funaria*, *Polytrichum*, *Sphagnum*) are all mosses.

Q.121 (2)
New NCERT Pg. No. 48
Pavo – Crop and gizzard
Vipera – No external ear openings
Pteropus – Mammary glands
Clarias – Operculum

Q.122 (4)
New NCERT Pg. No. 43
Aschelminthes can be parasite on both plants and animals.
They exhibit sexual dimorphism often females are longer than males.

Q.123 (4)
New NCERT Pg. No. 46
Scorpions have dorsal heart
Post anal tail is absent in octopus
Columba posses dorsal nerve cord

Q.124 (1)
New NCERT Pg. No. 46
Phylum Chordata is divided into three subphyla: **Urochordata** or **Tunicata**, **Cephalochordata** and **Vertebrata**.
Subphyla Urochordata and Cephalochordata are often referred to as **protochordates** and are exclusively marine

Q.125 (4)
New NCERT Pg. No. 45
Exclusively marine phylum – Echinodermata
Phylum of insects – Arthropoda
Second largest phylum – Mollusca
Phylum of sea-walnut – Ctenophora

Q.126 (4)
New NCERT Pg. No. 41, 42 & 44
Echinus, *Asterias*, *Antendon* all belong to phylum Echinodermata whose characteristic feature is presence of water vascular system.

Q.127 (2)
New NCERT Pg. No. 49
Crop and gizzard are present in digestive tract of birds as additional chambers.
Pteropus, *Balaenoptera*, *Delphinus* → Mammal

Q.128 (4)
New NCERT Pg. No. 41
Poriferans do not have flame cells.
Aurelia is a Coelenterata.
Pleurobrachia is a Ctenophora.

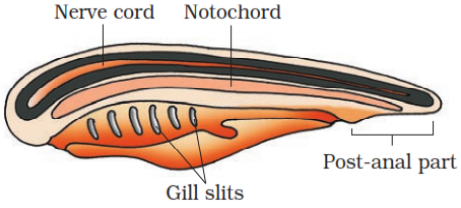
Q.129 (2)
New NCERT Pg. No. 42
The body of organisms belonging to phylum Ctenophora bears eight external rows of ciliated comb plates which help in locomotion.

Q.130 (3)
New NCERT Pg. No. 47 & 48
Pristis is a Cartilaginous fish.
Chelone is a Reptile
Ascidia is a Urochordate.

Q.131 (3)
New NCERT Pg. No. 41
Cnidoblasts or cnidocytes (which contain the stinging capsules or nematocysts) present on the tentacles and the body. Cnidoblasts are used for anchorage, defense and for the capture of prey

Q.132 (2)
New NCERT Pg. No. 43
Mesoderm is present in form of scattered pouches in between ectoderm and endoderm in phylum Aschelminthes.
Wuchereria and *Ancylostoma* are pseudocoelomates.

Q.133 (1)
New NCERT Pg. No. 46



Q.134 (2)
New NCERT Pg. No. 51

Balaenoptera – Blue whale
Pteropus – Flying fox
Testudo – Tortoise
Pterophyllum – Angel fish

Q.135 (4)
New NCERT Pg. No. 46

S. No.	Chordates	Non-chordates
1.	Notochord present.	Notochord absent.
2.	Central nervous system is dorsal, hollow and single.	Central nervous system is ventral, solid and double.
3.	Pharynx perforated by gill slits.	Gill slits are absent.
4.	Heart is ventral.	Heart is dorsal (if present).
5.	A post-anal part (tail) is present.	Post-anal tail is absent.

Heart is ventral in chordates and dorsal in non-chordates (if present).

SECTION-B

Q.136 (4)
New NCERT Pg. No. 4

The name of the discoverer is not printed in italics; instead, it is written in Roman script after the species name.
Only the genus and species names are italicized in binomial nomenclature.

Q.137 (3)
New NCERT Pg. No. 7

Wheat belongs to the order Poales, not Polymoniales. The other plants listed (Potato, Datura, and Petunia) belong to the order Polymoniales.

Q.138 (4)
New NCERT Pg. No. 18

Neurospora, commonly known as the Drosophila of Plant Kingdom, is extensively used in biochemical and genetic research due to its well-understood genetic system.

Q.139 (4)
New NCERT Pg. No. 17, 18

Conidia are asexual spores and are not formed through reduction division (meiosis).
Instead, they are produced by mitosis. Reduction division occurs during the formation of sexual spores, such as ascospores.

Q.140 (3)
New NCERT Pg. No. 18

In basidiomycetes, sex organs are generally absent, and plasmogamy occurs through the fusion of vegetative or somatic cells from different strains or genotypes.

Q.141 (1)
New NCERT Pg. No. 20, 21

The correct matches are:
a(iv): D.J. Ivanowsky - Discovery of TMV (Tobacco Mosaic Virus),
b(iii): Beijerineck - Contagium vivum fluidum (the concept of viruses),
c(ii): W.M. Stanley - Crystallization of virus,
d(i): T.O. Diener - Discovery of viroids.

Q.142 (2)
New NCERT Pg. No. 32

Gymnosperms exhibit xerophytic adaptations such as needle-like leaves, thick cuticles, and sunken stomata, which help them survive in dry environments by reducing water loss.

Q.143 (3)
New NCERT Pg. No. 29, 30

The other options refer to specific structures found in liverworts.
However, Rhizoids are unicellular and primary and secondary protonema are not specific to liverworts and found in mosses.

Q.144 (4)
New NCERT Pg. No. 26

Agar is produced by red algae (such as Gelidium and Gracilaria), not brown algae.
Agar is used in microbiological media and food products, but it is not typically used in ice cream production.

Q.145 (2)
New NCERT Pg. No. 30

Mosses have high water holding capacity and is useful in trans-shipment of living materials,
but this is not an ecological importance. The other options describe important ecological roles of mosses.

Q.146 (3)
New NCERT Pg. No. 48

Labeo, *Catla pterphyllum* $\rightarrow$ Bony fishes
Petromyzon and *Myxine* $\rightarrow$ Cyclostomates

Q.147 (4)
New NCERT Pg. No. 47

Pneumatic bones are feature of Aves.

Q.148 (4)
New NCERT Pg. No. 45

Aplysia is sea-hare which is a mollusca.
Antedon (sea-lily) → Echinodermata
Aphrodite (sea-mause) → Annelida
Hippocampus (sea-horse) → Bony fish

Q.149 (3)
New NCERT Pg. No. 44

Locusta is a gregarious pest.

Q.150 (4)
New NCERT Pg. No. 39

Aschelminthes are pseudocoelomates. Their coelom is present as scattered pouches between ectoderm of endoderm.

BIOLOGY-II
SECTION-A

Q.151 (2)
New NCERT Pg. No. 8

The correct ascending order of the taxonomic categories for the given species is:

• IV (Triticum aestivum) → I (Poaceae) → II (Poales) → III (Monocotyledonae) → V (Angiospermae).

• Triticum aestivum is the scientific name for wheat, which belongs to the family Poaceae, order Poales, class Monocotyledonae, and division Angiospermae.

Q.152 (1)
New NCERT Pg. No. 7

• The assertion is correct that potato and brinjal belong to the genus *Solanum* but are different species.

• The reason is also correct because a genus comprises related species that share more common characteristics than species from different genera. The reason correctly explains why potato and brinjal, though different species, are in the same genus.

Q.153 (3)
New NCERT Pg. No. 8

Statement-I is incorrect as the number of common characteristics increases from kingdom to species.

Statement-II is correct because higher the category, greater is the difficulty of determining the relationship to other taxa at the same level.

Q.154 (2)
New NCERT Pg. No. 14, 15

• Chrysophytes are golden algae (b).
• Dinoflagellates include organisms like Gonyaulax (c).
• Euglenoids are characterized by the absence of a cell wall (a).
• Slime moulds are saprophytic protists (d).

Q.155 (4)
New NCERT Pg. No. 17

Alternaria produces conidia (asexual spores) rather than zygospores.

The other pairs are correctly matched with their sexual spores: Albugo produces oospores, Penicillium produces ascospores, and Ustilago produces basidiospores.

Q.156 (2)
New NCERT Pg. No. 12

The correct identification of the bacterial shapes is:
Coccus (spherical),
Bacillus (rod-shaped),
Spirillum (spiral-shaped),
Vibrio (comma-shaped).

Q.157 (2)
New NCERT Pg. No. 17

In ascomycetes and basidiomycetes, the dikaryophase is the period between plasmogamy (fusion of cytoplasm) and karyogamy (fusion of nuclei), where two nuclei coexist in the same cell.

Q.158 (1)
New NCERT Pg. No. 11

Statement (a): Virus, Viroids, and Lichen are not classified in the five-kingdom classification, which is correct.

Statement (b): R.H. Whittaker gave the five-kingdom classification.

The other statements are incorrect.

Q.159 (2)
New NCERT Pg. No. 21

The Potato spindle tuber disease is caused by viroids, not prions.

Prions are infectious proteins, whereas viroids are small, circular RNA molecules that infect plants.

Q.160 (4)
New NCERT Pg. No. 14

The cell walls of diatoms do form two overlapping shells, not non-overlapping.

These shells fit together like a soapbox, with one half overlapping the other.

Q.161 (3)
New NCERT Pg. No. 17
The correct sequence of events in the fungal sexual cycle is:
Plasmogamy (fusion of cytoplasm),
Karyogamy (fusion of nuclei),
Meiosis (reductional division to produce spores).

Q.162 (4)
New NCERT Pg. No. 24
The classification system given by Bentham and Hooker was based on natural affinities among organisms, considering both external and internal features, not just superficial characteristics.

Q.163 (1)
New NCERT Pg. No. 33
The assertion is correct that gymnosperms are heterosporous, producing two kinds of spores: macrospores and microspores.
The reason provided is also true and correctly explains the assertion.

Q.164 (2)
New NCERT Pg. No. 27, 32, 33, 34
The correct matches are:
a(iii): *Wolffia* - Angiosperm,
b(iv): *Cedrus* - Gymnosperm,
c(ii): *Adiantum* - Pteridophyte,
d(i): *Sargassum* - Alga.

Q.165 (2)
New NCERT Pg. No. 27
Porphyra is a type of red algae that stores Floridian starch in a form similar to amylopectin and glycogen, which are polysaccharides used for energy storage.

Q.166 (1)
New NCERT Pg. No. 26
Pyrenoids are found in the chloroplasts of green algae and are centers for the formation of starch from sugars. They contain both protein and starch.

Q.167 (2)
New NCERT Pg. No. 31, 32
The prothallus is the gametophyte stage in pteridophytes (like ferns), which is generally small, thalloid, and photosynthetic.

Q.168 (3)
New NCERT Pg. No. 30
The leafy stage of moss consists of an upright, slender axis bearing spirally arranged leaves, which is the dominant stage of the life cycle in mosses.

Q.169 (4)
New NCERT Pg. No. 32, 33
In gymnosperms, the endosperm is haploid, not triploid. The triploid endosperm is a characteristic of angiosperms (flowering plants).

Q.170 (4)
New NCERT Pg. No. 31, 32
Antherozoids (male gametes) are produced in the gametophyte generation, not in the sporophyte. The sporophyte generation produces spores through meiosis.

Q.171 (3)
New NCERT Pg. No. 45
Proboscis gland → Hemichordata
Jointed appendages → Arthropoda
Comb plates → Ctenophora

Q.172 (2)
New NCERT Pg. No. 48
Amphibia → *Ichthyophis*
Pisces → *Pristis*
Reptilia → *Calotes*
Cephalochordate → *Branchiostoma*

Q.173 (3)
New NCERT Pg. No. 43
Leeches do not have pseudopodia for locomotion. They use a combination of muscles and suckers to move.

Q.174 (1)
New NCERT Pg. No. 40
Choanocytes or collar cells
line the spongocoel and the canals.

Q.175 (3)
New NCERT Pg. No. 42
Hooks and suckers are parasitic
adaptations present in platyhelminthes.
Taenia solium (Tapeworm) posses both hooks and suckers.

Q.176 (3)
New NCERT Pg. No. 44
Body of mollusca is covered by
calcareous shell.
Body is unsegmented.
Mollusca shows indirect development i.e. larval stages are present during development.

Q.177 (4)
New NCERT Pg. No. 42
The members of phylum ctenophora are exclusively marine and repreduces only by sexual means.

Q.178 (3)
New NCERT Pg. No. 40
In coelenterates, an undifferentiated layer, mesoglea is present between ectoderm and endoderm.

Q.179 (4)
New NCERT Pg. No. 49
Heart is 3-chambered in Amphibians and reptiles but crocidile is an exception having 4-chambered heart.

Q.180 (4)
New NCERT Pg. No. 42
Planaria is not a pseudocoelomate.

It is Acoelomate.

Q.181 (3)
New NCERT Pg. No. 49
In reptiles, fertilisation is internals

development is direct heart is 3-chambered.

Q.182 (2)
New NCERT Pg. No. 47
Jawed fishes belong to division Gnathostomata.
$\Rightarrow$ Hagfish, Lamprey $\rightarrow$ Cyclostomata (Agnatha) – lacks Jaw
$\Rightarrow$ Devil fish $\rightarrow$ Octopus (Mollusca)
$\Rightarrow$ Squid $\rightarrow$ Loligo (Mollusca)

Q.183 (1)
New NCERT Pg. No. 47
Carcharodon is a chondrichthyes that lacks air bladder and they have to swim constantly to avoid sinking.

Q.184 (3)
New NCERT Pg. No. 47
Mouth is ventrally located in scoliodon (Chondrichthyes).

Q.185 (2)
New NCERT Pg. No. 39
Metameric segmentation is present in Annelids, Arthropods and chordates.

SECTION-B

Q.186 (3)
Old NCERT Pg. No. 4, 5
- Statement (3) is correct as living organisms have the ability to replicate, regulate their internal environment, and evolve over generations, interacting with each other and their environment.
- Growth and cellular organization are not always considered as defining properties, as some non-living things can also grow (like crystals), and some living organisms might not grow under certain conditions.

Q.187 (3)
New NCERT Pg. No. 8
Mammalia, Dicotyledonae, and Insecta are all classes, making this the correct option where all taxa belong to the same taxonomic category.

Q.188 (4)
New NCERT Pg. No. 17, 18
The correct matches are:
a(ii): *Ustilago* - Basidiospores,
b(iv): *Claviceps* - Ascospores,
c(i): *Mucor* - Zygospores,
d(iii): *Trichoderma* - Conidia.

Q.189 (4)
New NCERT Pg. No. 13
Methanogens are a group of archaebacteria that produce methane and are found in anaerobic environments like marshes and the guts of ruminants (e.g., cows). They are not present in the guts of all animals.

Q.190 (4)
New NCERT Pg. No. 14
- Cholera, typhoid, and tetanus are all bacterial diseases, making this the correct set.
- The other options include viral diseases like mumps and chickenpox.

Q.191 (3)
New NCERT Pg. No. 17
In fungi, sexual reproduction involves the formation of oospores (in oomycetes), ascospores (in ascomycetes), and basidiospores (in basidiomycetes).

Q.192 (2)
New NCERT Pg. No. 32
The gametophyte of pteridophytes requires cool, damp, and shady environments to grow, as these

conditions provide the moisture necessary for the free-swimming male gametes to reach the female gametes.

Q.193 (2)
New NCERT Pg. No. 27
Pyriform, biflagellate gametes are characteristic of Brown algae like *Ectocarpus* and *Laminaria*.
These flagellated gametes are involved in the sexual reproduction of these algae.

Q.194 (1)
New NCERT Pg. No. 27
Polysiphonia, *Porphyra*, and *Gracilaria* are red algae that reproduce vegetatively by fragmentation, asexually by non-motile spores, and sexually by non-motile gametes.

Q.195 (1)
New NCERT Pg. No. 29
Gemmae are small, multicellular reproductive structures involved in asexual reproduction in *Marchantia* (a liverwort).

Q.196 (2)
New NCERT Pg. No. 46
The diagram given is of *Ascidia*.
Ascidia belongs to subphylum urchordata.
In Urochordates or tunicates, notochord is present only in tail of larvae.

Q.197 (2)
New NCERT Pg. No. 41
Organisms belonging to phylum coelenterata & ctenophora are diploblastic.

Q.198 (4)
New NCERT Page 45
Asterias (Star fish), *Echinus* (Sea urchin), *Antedon* (Sea lily), *Cucumaria* (Sea cucumber) and *Ophiura* (Brittle star) are all members of phylum Echinodermata.

Q.199 (1)
New NCERT Pg. No. 38
Radial symmetry is shown by organisms belonging to phylum:
(1) Echinodermata
(2) Coelenterata
(3) Ctenophora

Q.200 (3)
New NCERT Pg. No. 44
Members of phylum arthropoda have jointed appendages as the unique feature.