ANSWER KEY
NEET
Part Test-01 (XI Regular)

PHYSICS

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

CHEMISTRY

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

BIOLOGY-I

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

BIOLOGY-II

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

SOLUTIONS

PHYSICS
SECTION-A

Q.1 (2)

Rate of flow of liquid $Q = AV \Rightarrow$ S.I. unit $= m^3/s$

Q.2 (1)

$v = \lambda^a g^b \rho^c$

$[L^1 T^{-1}] = [L^1]^a \ [L^1 T^{-2}]^b \quad [M^1 L^{-3}]^c$

$[L^1 T^{-1}] = [M^c L^{a+b-3c} T^{-2b}]$

$c = 0, \quad 2b = 1 \ \Rightarrow b = \dfrac{1}{2}$

$a + b - 3c = 1$

$a + \dfrac{1}{2} - 0 = 1 \ \Rightarrow a = 1 - \dfrac{1}{2} = \dfrac{1}{2}$

$\lambda = \lambda^{\frac{1}{2}} g^{\frac{1}{2}} \rho^0$

Q.3 (3)

% error in $x = \dfrac{1}{2} [1\% + 2\% + 2 \times 2\%] \ = \dfrac{7}{2}\%$

Q.4 (3)

It can measure up to 3 place after decimal.

Q.5 (1)

Significant figure in the value 0.005 is 1.

Q.6 (2)

By the principle of homogneity

$[S] = [A] = [Bt] = [C] = [L]$

Hence unit of $AC = m^2$

Q.7 (2)

Dimension of $A \neq$ Dimension of C

Hence A–C will not be meaningful quantity.

Q.8 (2)

$[Power] = \dfrac{[Energy]}{[time]} = \dfrac{[ML^2 T^{-2}]}{T}$
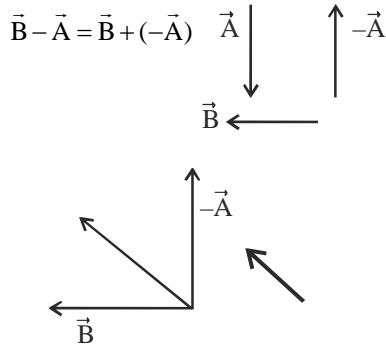
$= ML^2 T^{-3}$

$a = 1, b = 2, c = -3$

Q.9   (1)

$$n_2 = 1 \left[\frac{50g}{1000g}\right]\left[\frac{10\,cm}{100\,cm}\right]^{-1}\left[\frac{5s}{1s}\right]^{-2}$$

$$= \frac{1}{20}\times 10 \times \frac{1}{5^2} = \frac{1}{50}\,Pa$$

Q.10   (1)

Boltzmann constant $= J/K$

Q.11   (1)

$$\vec{B} - \vec{A} = \vec{B} + (-\vec{A}) \quad \vec{A}\Big\downarrow \qquad \Big\uparrow -\vec{A}$$

$$\vec{B} \leftarrow$$

Q.12   (2)

Magnitude of component of $\vec{B}$ along $\vec{A}$

$$= \left|\vec{B}\right|\cos\theta$$

$$= \frac{\left|\vec{A}\right|\cdot\left|\vec{B}\right|}{\left|\vec{A}\right|} = \frac{3+4}{\sqrt{2}} = \frac{7}{\sqrt{2}}$$

Component of $\vec{B}$ along $\vec{A}$

$$= \frac{\vec{A}\cdot\vec{B}}{\left|\vec{A}\right|} = \frac{7}{\sqrt{2}}\times\frac{\left(\hat{i}+\hat{j}\right)}{\sqrt{2}}$$

$$= \frac{7}{2}\left(\hat{i}+\hat{j}\right)$$

Q.13   (4)

At $t = 0$,
$X = 40 + 27(0) - 0^3 = 40$

$$v = \frac{dx}{dt} = 27 - 3t^2$$

$\because\ v = 0$

$27 - 3t^2 = 0$

$t^2 = 9$

$t = 3$

At $t = 3$,

$X = 40 + 27(3) - 3^3$

$= 40 + 81 - 27 = 94$

Displacement $\Delta x = 94 - 40 = 54\,m$

Q.14   (1)

$v^2 = 0^2 + 2as$

$$\frac{v_2}{v_1} = \sqrt{\frac{s_2}{s_1}} \quad \Rightarrow \quad \frac{3}{1} = \sqrt{\frac{s_2}{4}}$$

$$\Rightarrow s_2 = 36\,m = 4 + x \Rightarrow x = 32\,m$$

Q.15   (4)

Acceleration $= 4t - 3 \Rightarrow$ at $t = 1 \Rightarrow a = 1\,m/s^2$

$\Rightarrow v = 2t^2 - 3t + 1 \Rightarrow$ at $t = 2 \Rightarrow v = 3m/s^2$

$$\Rightarrow a = 0 \Rightarrow 4t - 3 = 0 \Rightarrow t = \frac{3}{4}\,sec$$

$$\Rightarrow a_{avg} = \frac{\Delta v}{\Delta t} = \frac{v_2 - v_1}{t_2 - t_1} = \frac{3-1}{2-0} = 1\,m/s^2$$

Q.16   (1)

$$\text{average speed} < \vec{v} > = \frac{displacement}{time}$$

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

Q.17   (3)

displacement is vector line joining initial and final point i.e. C

Q.18   (2)

$$t = \sqrt{\frac{2h}{g}} = 3\sec$$

$h = 45\,m$

Q.19   (1)

$$\vec{v} = \vec{u} + \vec{a}\,t$$

$$= (3\hat{i} + 4\hat{j}) + (0.4\hat{i} + 0.3\hat{j}) \times 10$$

$$= 7i + 7j \quad \Rightarrow |\vec{v}| = 7\sqrt{2}$$

Q.20   (1)

$$\frac{S_4}{S_3} = \frac{0 + \dfrac{1}{2}a(2\times 4 - 1)}{0 + \dfrac{1}{2}a(2\times 3 - 1)} = \frac{7}{5}$$

Q.21   (1)

$$\left|\vec{V}_A - \vec{V}_B\right| = \sqrt{V_A^2 + V_B^2 - 2V_A V_B \cos\theta}$$

$$= \sqrt{V^2 + V^2 - 2V^2 \cos 60°}$$

$$= \sqrt{V^2} = V = 2\,m\,s^{-1}$$

Q.22 (2)

distance $\geq$ | displacement|

If distance $= 0 \Rightarrow$ | displacement| $= 0$

Q.23 (2)

For (A) : $a = 2$

$\therefore$ $v = 2t + 4 \to$ Straight line (increasing)

For (B) : $a = t$

$\therefore$ $v = \dfrac{t^2}{2} + 4 \to$ upward parabola

For (C) : $a = -t$

$\therefore$ $v = \dfrac{-t^2}{2} - 4 \to$ downward parabola

For (D) : $a = -2$

$\therefore$ $a = -2t + 4 \to$ stright line (decreasing)

Q.24 (2)

$t = \sqrt{\dfrac{2h}{g}}; \dfrac{t_1}{t_2} = \sqrt{\dfrac{h_1}{h_2}} = \sqrt{\dfrac{36}{64}} = \dfrac{6}{8} = \dfrac{3}{4}$

Q.25 (2)

According to Galileo's ratio distance covered in consecutive second = 1 : 3 : 5 : 7

Distance covered in 1st second = H/9

Distance covered in 2nd second = 3H/9

Distance covered in 3rd second = 5H/9

where H is total height. Hence total time of fall is 3 sec.

Q.26 (3)

Assertion (A) is true because the slope of a velocitytime graph does represent acceleration. In a velocity-time graph, the slope at any point on the graph represents the rate of change of velocity, which is the definition of acceleration.

Reason (R) is false because the area under an acceleration-time graph represents the change in velocity, not the change in displacement.

So, while (A) is true, (R) is not a correct explanation of (A), and option 3 is the appropriate choice.
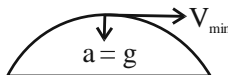
Q.27 (3)

$\vec{V}_{A/B} = \vec{V}_A - \vec{V}_B = -10\hat{i} - (-10\hat{j})$

$\vec{V}_{A/B} = -10\hat{i} + 10\hat{j}$

Q.28 (3)

$V_m = 4 \text{ m/s}$

$V_{Rm} = -3\hat{j} \quad \Rightarrow V_{Rm} = V_R - V_m$

$-3\hat{j} = V_R - 4\hat{i}$

$V_R = 4\hat{i} - 3\hat{j}$

$|V_R| = \sqrt{4^2 + 3^2} = 5 \text{ m/s}$

Q.29 (4)

$h_{max} = \dfrac{u^2}{2g} = 10$

$u^2 = 200 ....(1)$

$R_{max} = \dfrac{u^2}{g} = 20\text{m}$

Q.30 (2)

Bodies projected with same speed at complimentary angles with horizontal have equal ranges. Maximum range of projectile is when it is projected at $45°$.

Q.31 (3)

$R = 4H \cot\theta, u\cos\theta = u / \sqrt{2}$

Given $R = NH$

$\cos\theta = 1 \sqrt{2}$ so $\theta = 45°$

$\therefore$ $NH = 4H \cot 45°$

$N = 4$

Q.32 (3)

$\vec{V}_{min} \perp \vec{a}$

$\vec{V}_{min} \cdot \vec{a} = 0$

Q.33 (3)

$R = u\sqrt{\dfrac{2H}{g}}$

$10 = u\sqrt{\dfrac{2 \times 5}{10}}$

$u = 10 \text{ m/s}$

Q.34 (2)

$\vec{a} \cdot \vec{v} > 0$

Q.35 (3)

$a = \sqrt{a_t^2 + a_{cp}^2} = \sqrt{\left(\dfrac{dv}{dt}\right)^2 + \left(\dfrac{v^2}{r}\right)^2}$

$a = \sqrt{(4)^2 + \left(\dfrac{3600}{1200}\right)^2} = 5\text{m/s}^2$

SECTION-B

Q.36 (3)

Scalar and vector quantity may have same dimension but cannot be added or subtracted.

Thus, same dimension quantities may be added or subtracted.

Q.37 (4)

$n + 1(VSD) = n(MSD) \Rightarrow 1VSD = \dfrac{n}{n+1}MSD$

$\text{Least count} = 1MSD - 1VSD = \left[1 - \dfrac{n}{n+1}\right]MSD$

$= \dfrac{1}{n+1}MSD = \dfrac{1}{n(n+1)}cm$

Q.38 (1)

$S = v.t = (10.00)(5.00)$

$S = 50.0\,m$

$\dfrac{\Delta S}{S} = \dfrac{\Delta V}{V} + \dfrac{\Delta t}{t} \Rightarrow \dfrac{\Delta S}{S} = \dfrac{0.01}{10} + \dfrac{0.01}{5} = \dfrac{0.03}{10}$

$\dfrac{\Delta S}{S} \times 100 = \dfrac{0.03}{10} \times 100 = 0.3\%$

$S = (50.0 \pm 0.3\%)\,m$

Q.39 (3)

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

$P = \dfrac{F}{A} \Rightarrow [P] = [M^1 L^{-1} T^{-2}]$

Q.40 (3)

$10\,VSD = 9\,MSD$

$1\,VSD = \dfrac{9}{10}MSD$

$LC = 1\,MSD - 1\,VSD$

$= 1\,MSD - \dfrac{9}{10}MSD$

$= 0.1\,MSD$

$LC = \dfrac{0.1}{10}cm = 0.01cm$

Measured value

$= 2.8 + 7(0.01)$

$= 2.87\,cm$

Q.41 (3)

$V_{avg.} = \dfrac{\text{Total distance}}{\text{Total time}} = \dfrac{10+10+10}{15} = 2\,m/s$
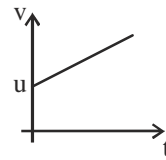
Q.42 (1)

$D = 2R + \pi R + 2R$

$= 4R + \pi R$

Q.43 (3)

Time taken by 1st stone to reach highest point

$t = \dfrac{U}{g} = \dfrac{50}{10} = 5\,sec$

Velocity of second stone after 5 second is

$v = u + gt = 50 + 10 \times 5 = 100\,m/s$

Q.44 (3)

$V = u + at$

$\underset{y}{\downarrow} = \underset{c}{\downarrow} + mx$

$\Rightarrow = mx + c$

Q.45 (4)

$V = \dfrac{ds}{dt} = 9t^2 + 14t$

$V_{at\,t=1} = 23\,m/s$

Q.46 (2)

$\sin\theta = \dfrac{U}{V} = \dfrac{4}{10}$

$\theta = \sin^{-1}\left(\dfrac{2}{5}\right)$ with PQ up the stream

Q.47 (2)

$y = x\tan\theta\left(1 - \dfrac{x}{R}\right)$

$y = \sqrt{3}x\left[1 - \dfrac{x}{\dfrac{\sqrt{3}}{5}}\right]$

$\Rightarrow R = \dfrac{\sqrt{3}}{5}$

Q.48 (2)

$T = \dfrac{2u\sin\theta}{g}$

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

$$\frac{H}{T^2} = \frac{u^2 \sin^2 \theta}{2g} \times \frac{g^2}{4u^2 \sin^2 \theta}$$

$$= \frac{g}{8} = \frac{10}{8} = \frac{5}{4}$$

Q.49 (3)

$y = Pt^2 - Qt^3$

$$V = \frac{dy}{dt} = 2Pt - 3Qt^2$$

At maximum height $V = 0$

$t(2P - 3Qt) = 0$

$t = 0$, $t = \frac{2P}{3Q}$ maximum height

$$y_{max} = P\left(\frac{2P}{3Q}\right)^2 - Q\left(\frac{2P}{3Q}\right)^3$$

$$= \frac{4P^3}{9Q^2} - \frac{8P^3}{27Q^2} = \frac{12P^3 - 8P^3}{27Q^2} = \frac{4P^3}{27Q^2}$$

Q.50 (2)

$a = \omega^2 R$

$$= (6\pi)^2 \times \frac{1}{2} = 18\pi^2 \, \text{m/s}^2$$

CHEMISTRY
SECTION-A

Q.51 (2)

Zero preceding to first non-zero digits are not significant

Q.52 (4)

Element	%P	atomic mass	%P/atomic mass	mole ratio	Whole No.
C	67.9	12	5.66	$\frac{5.66}{1.88} = 3$	3
H	5.7	1	5.7	$\frac{5.7}{1.88} = 3$	3
N	26.4	14	1.88	$\frac{1.88}{1.88} = 1$	1

Empirical formula is C_3H_3N

Q.53 (4)

$$n_{Al} = \frac{108}{27} = 4$$

$$n_{MnO} = \frac{213}{71} = 3$$

$\therefore$ 2 mol Al react with 3 mole MnO

$\therefore$ 4 mole Al react with 6 mole MnO

So Al is present in excess

& MnO is L.R.

3 mole MnO react = 2 mole Al

So left Al = 2 mol = 54 g Al

Q.54 (4)

$$\left(\frac{mol}{S.C}\right)_{CH_3OH} = \frac{64/32}{2} = 1$$

$$\left(\frac{mol}{S.C}\right)_{O_2} = \frac{\left(\frac{44.8}{22.4}\right)}{3} = 0.67$$

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

$$\left(\frac{mol}{S.C}\right)_{CO_2} = \left(\frac{mol}{S.C}\right)_{O_2}$$

$$\frac{mol}{2} = \frac{2}{3}$$

mol of CO_2 produced = $\frac{4}{3}$

Q.55 (2)

Number of oxygen atom = mol of $C_9H_8O_4 \times N_A \times 4$

$$= \frac{360 \times 10^{-3}}{180} \times N_A \times 4$$

$$= 2 \times 10^{-3} \times 6 \times 10^{23} \times 4 = 48 \times 10^{20}$$

Q.56 (3)

According to dalton's atomic theory;

Smallest particle of any matter is atom which is neutral so generation of electricity by rubbing of glass rod with silk can not be explained by this theory.

Q.57 (2)

For 8.8 g of CO_2

no. of molecule = $\frac{8.8}{44} \times 6.023 \times 10^{23} = 12.046 \times 10^{22}$

For 5.6 L of CO_2 at STP

mole = $\frac{5.6}{22.4} = 0.25$

no. of o-atom = $\frac{96}{32} \times 2 \times 6.023 \times 10^{23} = 36.138 \times 10^{23}$

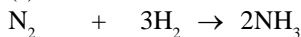For 49 g of H_2SO_4

mole = $\frac{49}{98} = 0.5$

Q.58 (1)

	C	H	N	O
% Mass	20	6.67	46.67	26.66
$\frac{\% \text{ Mass}}{\text{A.M.}}$	$\frac{20}{12}$	$\frac{6.67}{1}$	$\frac{46.67}{14}$	$\frac{26.66}{16}$
Mole	1.66	6.67	3.33	1.66

Mole Ratio : 1 : 4 : 2 : 1
Formula CH_4N_2O

Q.59 (1)
$N_2 + 3H_2 \rightarrow 2NH_3$
0.5 mol   0.5 mol
         LR
$3\,mol\,H_2 \rightarrow 2\,mol\,NH_3$

$0.5\,mol\,H_2 \rightarrow \dfrac{2}{3} \times 0.5\,mol\,NH_3 = \dfrac{1}{3}\,mol$
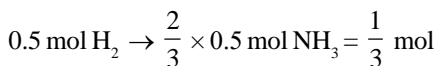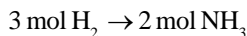
$\%\ yield = \dfrac{0.25}{\dfrac{1}{3}} \times 100 = 75\%$

Q.60 (2)
1 mole of any gas having same temperature and pressure occupy same volume and 1 mole of gas at NTP occupies 22.4 L volume.

Q.61 (2)
Total rupees $= 10 \times 6.022 \times 10^{23} = 6.022 \times 10^{24}$
if we spend Rs. 1,00,000 in 1 sec, then
Rs 6.022×10^{24} will be spent in $(6.022 \times 10^{24}/1,00,000)$
$= 6.022 \times 10^{19}$ sec.
6.022×10^{19} sec $= 6.022 \times 10^{19}/(60 \times 60 \times 24 \times 365)$
$= 1.909 \times 10^{12}$ years

Q.62 (3)
1 mole of N_2 occupy 22.4 L
So, 0.25 mole of N_2 occupy 5.6 L

Q.63 (3)
1 mole of $K_3[Fe(CN)_6] = 6$ mole C.
0.8 mole of $K_3[Fe(CN)_6] = 6 \times 0.8 \times 12$ g C
$= 57.6$ g

Q.64 (3)
(1) 1 mole of $N_2 = N_A$ molecules
     2 mole of $N_2 = 2N_A$ molecules
(2) 28g of $N_2 = N_A$ molecules
     41g of $N_2 = 1.46\,N_A$ molecules
(3) $6.022 \times 10^{24} = 10N_A$
(4) 1g atom of $N_2 = N_A$ molecules
     5g atom of $N_2 = 5\,N_A$ molecules

Q.65 (1)
Average atomic mass
$= \dfrac{78.9183361 \times 50.69 + 80.916289 \times 49.31}{100} = 79.9$

Q.66 (4)
Number of degenerate orbitals in third shell of hydrogen atom is 9.
3rd shell - 3s, 3p, 3d
so total degenerate orbitals = 1 + 3 + 5 = 9

Q.67 (2)
Shape of atomic orbital depends upon azimuthal quantum number i.e. l.

Q.68 (2)

$\Delta x.\Delta p \ge \dfrac{h}{4\pi}$

$2\Delta p.\Delta p \ge \dfrac{h}{4\pi}$

$\Delta p^2 = \dfrac{h}{8\pi}$

$\Delta v^2 = \dfrac{h}{8\pi m^2}$

$\Delta v = \sqrt{\dfrac{h}{8\pi m^2}}$

Q.69 (3)

Angular momentum $= \sqrt{\ell(\ell+1)}\,h$

$= \sqrt{2(2+1)}\,h$

$= \sqrt{6}\,h$

Q.70 (4)
For multielectronic species higher is the value of $(n + \ell)$ higher is the energy of robital. For same value of $(n + \ell)$ higher is the value of n, higher is the energy of orbital.

Q.71 (1)
e/m ratio of electron is maximum among the given options as the mass of electron is minimum.

Q.72 (4)
The nature of emission of radiation from hot bodies (black-body radiation) is explained by particle nature of electromagnetic radiation

Q.73 (2)

Series	Spectral region
Lyman	Ultraviolet
Balmer	Visible
Paschen	Infrared
Brackett	Infrared
Pfund	Infrared

Q.74 (4)
For n = 3 ; no of orbitals = $n^2 = 3^2 = 9$

and each orbital has 1e– which has $m_s = -\frac{1}{2}$, So total

$e^- = 9$

Q.75 (4)

Lobes of d_{xy} and d_{yz} lies in between the axes.

Q.76 (3)

In photoelectric effect, no of electrons ejected is proportional to intensity of light used.

Q.77 (4)

Magnetic quantum number gives information about spatial orientaton of orbital with respect to set of co-ordinate axis.

For a given value of n; ℓ can have n values and varies from 0 to n –1

Q.78 (1)

Given element with electronic configuaration $1s^2$, $2s^2$, $2p^6$, $3s^1$ is Na ; So element below it is K whose atoms no. is 19

Q.79 (2)

The electric field and magnetic field is perpendicular to direction of propagation of wave.

All electromagnetic wave have different wavelength

Q.80 (3)

$\Rightarrow$ All d orbitals have same energy in the absence of electric and magnetic field.

$\Rightarrow$ Total orbital for n = 3 is $3^2 = 9$

Shape of d_{xy}, d_{yz} and d_{zx}, $d_{x^2-y^2}$

are similar but d_{z^2} is different.

Q.81 (3)

(A) $|\psi|^2$ represent the probability of finding an electron at a point within an atom.

(B) de- Broglie wavelength is the wavelength of matter in motion.

(C) Heisenberg uncertainity principle states that it is impossible to determine position and momentum exactly simultaneously of electron.

(D) According to planck ; energy of radiation can be absorbed or emitted in the form of packets

Q.82 (2)

From the graph ; no of radial node = 1; So orbital is 2S

Q.83 (4)

If $n = 5$, $\ell = 0$

Subshell is 5s

if $n = 4$; $\ell = 1$

Subshell is 4p

if $n = 3$, $\ell = 2$

Subshell is 3d

Total $e^- = 2 + 6 + 10 = 18$

Q.84 (4)

For H-atom

$E \propto n$ (only)

$2s = 2p$

& $3d < 4s$ are correct match.

Q.85 (1)

Energy depends on (n + 1)

$1 \rightarrow (n+1) = 6$

$2 \rightarrow (n+1) = 5$

$3 \rightarrow (n+1) = 5$

$4 \rightarrow (n+1) = 5$

$\therefore$ Max energy for 1

SECTION-B

Q.86 (2)

Mole of $H_2O = \dfrac{18 \times 10^{-3}}{18} = 1 \times 10^{-3}\,\text{mol} = 10 \times 10^{-4}$

Mole of H_2O removed $= \dfrac{10^{20}}{6.02 \times 10^{23}} = 1.66 \times 10^{-4}\,\text{mol}$

Moles of H_2O left $= 8.3 \times 10^{-4}\,\text{mol}$

Q.87 (1)

Average atomic mas of X

$= \dfrac{144 \times 40 + 142 \times 20 + 146 \times 40}{100}$

$= 144.4\,\text{u}$

Q.88 (2)

$\left(\dfrac{\text{mol}}{\text{S.C}}\right)_{N_2} = \left(\dfrac{\text{mol}}{\text{S.C}}\right)_{Ba(N_3)_2}$

$\dfrac{\text{mol}}{3} = \dfrac{442}{221} = 2$

mol of $N_2 = 2 \times 3 = 6$
obtained

mass of $N_2 = 6 \times 28 = 168\,\text{g}$
obtained

Q.89 (1)

(I) 0.5 mole $O_3 = 24\,\text{g}\,O_3$;

(II) 0.5 g atoms of oxygen = 8g

(III) $\dfrac{3.011 \times 10^{23}}{6.022 \times 10^{23}} \times 32 = 16\,\text{g}\,O_2$

(IV) $\dfrac{5.6}{22.4} \times 44\,\text{g}\,CO_2 = 11\,\text{g}\,CO_2$

Q.90 (4)

$4HCl(aq) + MnO_2(s) \rightarrow 2H_2O(1) + MnCl_2(aq) + Cl_2(g)$

According to the reaction, 1 mole of MnO_2 reacts with

4 moles of HCl.

Therefore, 87 g of MnO_2 react with $\rightarrow 4 \times 36.5$ g of HCl

$\therefore$ 5g of MnO2 react with $\rightarrow \dfrac{4 \times 36.5}{87} \times 5$ g of HCl

$\rightarrow 8.4$ g of HCl

Q.91 (3)

$40.6 = x\,(40) + (1-x)\,41$

$40.6 = 40x + 41 - 41x$

$x = 0.4$

$1 - x = 0.6$

Abundance of Z^{40} in nature is 40% and Abundance of Z^{41} in nature is 60%

Q.92 (1)

$\left(\dfrac{mol}{S.C}\right)_{N_2} = \dfrac{56/28}{1}, \left(\dfrac{mol}{S.C}\right)_{H_2} = \dfrac{10/2}{3}$

$= 2 \qquad\qquad = 1.66$

Since $\left(\dfrac{mol}{S.C}\right)_{H_2}$ in Ist option is lesser so H_2 is limiting

reagent in it

Q.93 (2)

No. of radial nodes $= n - \ell - 1$

$= 4 - 1 - 1 = 2$

No. of angular nodes $= \ell = 1$

Q.94 (1)

Energy of photon $= h\nu$

$= 6.6 \times 10^{-34} \times 2 \times 10^{15}$

$= 13.2 \times 10^{-19}\,J$

Work function $= 5\,eV$

$= 5 \times 1.6 \times 10^{-19}\,J$

$= 8 \times 10^{-19}\,J$

$KE = h\nu - \phi$

$= 13.2 \times 10^{-19} - 8 \times 10^{-19}$

$= 5.2 \times 10^{-19}\,J$

Q.95 (3)

$\dfrac{1}{\lambda} = R_H \left(\dfrac{1}{n_1^2} - \dfrac{1}{n_2^2}\right)$

or $\dfrac{1}{\lambda} = R_H \left(\dfrac{1}{1^2} - \dfrac{1}{3^2}\right)$

or $\dfrac{1}{\lambda} = R_H \dfrac{8}{9}$

or $\lambda = \dfrac{9}{8R_H}$

Q.96 (2)

$\lambda = \dfrac{h}{mv}$

$mv = \dfrac{nh}{2\pi r_n}$

$\lambda = \dfrac{h \times 2\pi r_n}{nh} = \dfrac{2\pi r_n}{n}$

$\lambda = \dfrac{2\pi a_o \times n^2}{n} = 2\pi a_o \times n$

$\lambda = 2\pi a_o \times 3$

$\lambda = 6\pi \times 52.9 = 317.4\,\pi$

Q.97 (1)

The uncertainty in the speed is 2% , i.e.,

$\Delta v = 100 \times \dfrac{2}{100} = 2\,m/s$

$\Delta x.m\Delta v = \dfrac{h}{4\pi}$

$\Delta x = \dfrac{h}{4\pi m \Delta v}$

$\Delta x = \dfrac{6.626 \times 10^{-34}\,Js}{4 \times 3.14 \times 50 \times 10^{-3}\,kg \times 2\,ms^{-1}}$

$= 5.27 \times 10^{-34}\,m$

Q.98 (1)

$m = \dfrac{10^{-10}}{1000} = 10^{-13}\,kg$

$\Delta v = \dfrac{10^{-6}}{100} \times \dfrac{0.0001}{100} = 10^{-14}\,m/s$

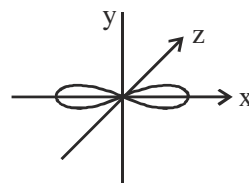$\Delta x \cdot m \cdot \Delta v = \dfrac{h}{4\pi}$

$\Delta x = \dfrac{h}{4\pi m \cdot \Delta v} = \dfrac{6.62 \times 10^{-34} \times 7}{10^{-13} \times 10^{-14} \times 4 \times 22}$

$= 5.26 \times 10^{-8}\,m$

Q.99 (4)

For P_x orbital,

yz plane is nodal plane as electron density is zero in yz plane

Q.100 (2)

(1) For isodiaphers

Value of A - 2z is same

For $_{92}U^{238}$, A-2z $= 238 - 2 \times 92$

$\qquad = 54$

For $_{90}^{234}Th$ A $- 2Z = 234 - 2 \times 90 = 54$

(2) Isotones have same no of neutrons i - e same value of A-Z

For $_8^{16}O$; A - Z = 16 - 8 = 8

For $_7^{14}C$; A - Z = 14 - 7 = 7

(3) For isobars ; mass no is same.

$_{20}^{40}Ca$; mass no is 40

$_{18}^{40}Ar$; mass no is 40

(4) isoelectronic have same no of electron

CO_2 has $6 + 2 \times 8 = 22 \, e^-$

N_2O has $2 \times 7 + 8 = 22e-$

BIOLOGY-I
SECTION-A

Q.101 (4)
NCERT Pg. No. 4
• Fungi (a) produce asexual spores, hence match with option (i).
• Amoeba (b) reproduces through binary fission, hence match with option (ii).
• Hydra and Yeast (c) reproduce by budding, hence match with option (iv).
• Planaria (d) exhibits true regeneration, hence match with option (iii).
The correct combination according to the options given is (4).

Q.102 (1)
NCERT Pg. No. 8
The taxonomic categories of the housefly in descending order are:
1. Kingdom: Animalia
2. Phylum: Arthropoda
3. Class: Insecta
4. Order: Diptera
5. Family: Muscidae
6. Genus: Musca
Therefore, the correct arrangement is (1).

Q.103 (2)
NCERT Pg. No. 4, 5
• Statement (1): Biological names are generally in Latin and written in italics. This is incorrect as they are often in Latin but not necessarily Greek.
• Statement (2): The first word in a biological name represents the genus while the second denotes the specific epithet. This is correct.
• Statement (3): Both genus and species in a biological name are handwritten separately underlined or printed in italics. This is incorrect.

• Statement (4): The genus starts with a capital letter while the specific epithet starts with a small letter. This is incorrect.
The correct statement is (2).

Q.104 (3)
NCERT Pg. No. 10
Aristotle classified animals based on the absence or presence of red blood. Therefore, the correct answer is (3).

Q.105 (4)
NCERT Pg. No. 15
• Dinoflagellates have two flagella, one in a longitudinal groove and the other in a transverse groove.
• Their cell wall is composed of stiff cellulose plates and they appear in various colors due to different pigments.
The incorrect statement is (4) as both flagella are not present at the same position.

Q.106 (4)
NCERT Pg. No. 18
• Basidiocarp is the fruiting body of Basidiomycetes like *Agaricus*.
• Ascocarp is the fruiting body of Ascomycetes like *Claviceps*.

Q.107 **(4)**
NCERT Pg. No. 13, 16, 18
• Statement (A): Sexual reproduction in Monera does not involve cell fusion and gamete formation. This is incorrect.
• Statement (B): The disease caused by *Plasmodium* (malaria) has a staggering effect on the human population. This is correct.
• Statement (C): *Saccharomyces* (yeast) being ascomycete has septate and branched mycelium. This is incorrect as yeast is unicellular.
• Statement (D): Coenocytic hyphae are continuous tubes filled with multinucleated cytoplasm. This is correct.
The correct statements are (B) and (D), so the answer is (4).

Q.108 (3)
NCERT Pg. No. 13
• Statement (1): Blue-green algae (cyanobacteria) have pigments similar to green plants, which is correct.
• Statement (2): Some members of eubacteria play a significant role in recycling sulfur, which is correct.
• Statement (3): Only chemosynthetic autotrophic bacteria form blooms in polluted water bodies is incorrect; photosynthetic bacteria like cyanobacteria also form blooms.

• Statement (4): The colonies of Nostoc are surrounded by a gelatinous sheath, which is correct.
The incorrect statement is (3).

Q.109   (3)
NCERT Pg. No. 17
• Statement (a): Fruiting body ascocarp is not formed in *Rhizopus*; it forms zygospores.
• Statement (b): Mycelium is aseptate and coenocytic in Rhizopus, which is correct.
• Statement (c): Asexual spores are endogenously produced in sporangia, not exogenously.
The correct statement is (b) only, so the answer is (3).

Q.110   (2)
NCERT Pg. No. 13
• Statement A: Bacteria show the most extensive metabolic diversity, which is correct.
• Statement B: Archaebacteria differ from other bacteria in having different cell membrane structure, not nuclear membrane, which is incorrect.
Thus, the correct answer is (1).

Q.111   (4)
NCERT Pg. No. 14
• Statement (a): Mycoplasma are prokaryotic organisms, which is correct.
• Statement (b): They are smallest living cells known and are facultative anaerobes, not obligate anaerobes, so this is incorrect.
• Statement (c): They are insensitive to some antibiotics like penicillin, which is correct.
• Statement (d): They are pathogenic in animals and plants, which is correct.

Q.112   (3)
NCERT Pg. No. 24
• *Fucus*: Has motile male gametes.
• *Chlamydomonas*: Unicellular, not thalloid filamentous.
• *Ectocarpus*: Filamentous alga, which is correct.
• *Porphyra*: Exhibits oogamous reproduction.
The correct match is (3).

Q.113   (2)
NCERT Pg. No. 27
In brown algae:
• Food is stored in the form of mannitol.
• Vegetative cells have a cellulosic wall usually covered by a gelatinous coating of algin.
• They are found primarily in marine habitats.
• Zoospores have two unequal laterally placed flagella, not apically.
The incorrect statement is (2).

Q.114   (3)
NCERT Pg. No. 30
• The predominant stage in the life cycle of mosses is the gametophyte (1), which is correct.
• Mosses have an elaborate mechanism for spore dispersal (2), which is correct.
• Their juvenile stage is represented by the protonema stage, not the leafy stage (3), which is incorrect.
• Vegetative reproduction in mosses occurs by fragmentation and budding in the secondary protonema (4), which is correct.
The incorrect statement is (3).

Q.115   (2)
NCERT Pg. No. 32
Both the statements are correct
• Statement A: The spread of living pteridophytes is limited and restricted to narrow geographical regions, which is correct.
• Statement B: The multicellular (not unicellular), free-living, mostly photosynthetic thalloid gametophyte of pteridophytes is called prothallus, which is incorrect.

Q.116   (3)
NCERT Page 13
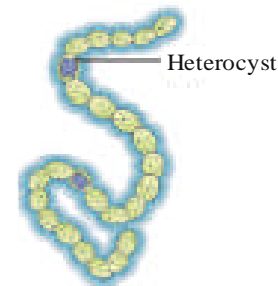
Q.117   (4)
NCERT Pg. No. 32
Adiantum belongs to the class Pteropsida, which includes ferns

Q.118   (4)
NCERT Pg. No. 26
Chlorella is a unicellular alga used as a food supplement, even by space travelers

Q.119   (1)
NCERT Pg. No. 24
Both Assertion and Reason are true and Reason is the correct explanation of Assertion
Assertion: Sexual reproduction in *Spirogyra* is isogamous, which is true.
Reason: Both fusing gametes of *Spirogyra* are non-flagellated and similar in size, which is true and explains the assertion

Q.120 (1)
NCERT Pg. No. 26
Photosynthetic pigments
The classification of algae is primarily based on their photosynthetic pigments

Q.121 (3)
NCERT Pg. No. 18
*Neurospora* is used extensively in biochemical and genetic work

Q.122 (3)
NCERT Pg. No. 30
Among the given options, *Polytrichum* (a moss) has a more elaborate mechanism of spore dispersal.

Q.123 (1)
NCERT Pg. No. 26, 27, 30, 32
- Chlorophyceae (i): *Chara* (b).
- Lycopsida (ii): *Selaginella* (c).
- Phaeophyceae (iii): *Ectocarpus* (a).
- Liverwort (iv): *Marchantia* (d).
The correct matching is (1).

Q.124 (2)
NCERT Pg. No. 48
Osteichthyes have terminal mouth.

Q.125 (3)
NCERT Pg. No. 46
Urochordates + Cephalochordates
⇓
   Protochordates
In urochordates, notochord is present only in larval tail. In cephalochordates, notochord exlends from head to tail region and is persistent throughout life.

Q.126 (3)
Q.127 (4)
NCERT Pg. No. 47
Both *scoliodon* (Dog fish) and *Pristis* (Saw fish) belongs to class chondrichthyes and have cartilaginous endoskeleton.
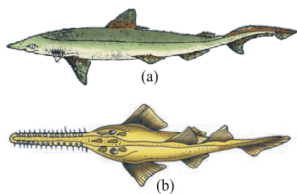
Example of cartilaginous fishes : (a) *Scoliodon* (b) *Pristis*

Q.128 (3)
NCERT Pg. No. 44
Economically important insects – Apis (Honey bee), Bombyx (Silkworm), Laccifer (Lac insect).

Q.129 (1)
NCERT Pg. No. 47
Petromyzon (Lamprey) is jawless fish.

Q.130 (3)
NCERT Pg. No. 45, 46
Apple snail - Pila ⎫
Devil fish - Octopus ⎬ Mullusca
Cuttle fish - sepia ⎭
Star fish - Asterias ⎫
Sea lily - Antedon ⎬ Echinodermata
King Crab - Limulus Arthropoda
Ascidia, Salpa, Doliolum - Urochordata
Lancelet - Amphioxus - Cephalochordata
Myxine - Hagfish - Cyclostomata
Balanoglossus - Hemichordata

Q.131 (1)
NCERT Pg. No. 47
The body of cyclostomates is devoid of scales and paired fins. Circulation is a closed type.

Q.132 (1)
NCERT Pg. No. 38, 45
The adult echinoderms are radially symmetrical but larvae are bilaterally symmetrical - Sea cucumber, sea anemone.
When any plane passing through the central axis of the body divides the organism into two identical halves, it is called radial symmetry.

Q.133 (1)
NCERT Pg. No. 40, 42, 44, 45

(a)	Porifera	Presence of water canal system
(b)	Platyhelminthes	Organ level of organisation
(c)	Arthropoda	Triploblastic and coelomate
(d)	Echinodermata	Spiny-skinned invertebrates

Q.134 (4)
NCERT Pg. No. 48
In Chondrichthyes, notochord is persistent throughout life.
Chondrichthyes : Dog fish, Great white shark, Saw fish.
Angel fish(*Pterophyllum*) is a Bony fish.

Q.135 (3)
NCERT Pg. No. 44
Parapodia - Help is swimming
Statocysts - Balancing organs.
Feather - Respiratory like gills and excretory function.
Radula - File like rasping organ.

SECTION-B

Q.136 (1)

Q.137 (4)
NCERT Pg. No. 8
- Solanum is a genus name, not a species.
- Sapindales is an order name, not a family.
- Monocotyledonae is a class name, not a division.
- *Mangifera* is indeed a genus.
Therefore, the correct answer is (4).

Q.138 (2)
NCERT Pg. No. 16
- Statement (a): Most fungi are saprophytic, not holophytic (autotrophic).
- Statement (b): Asexual reproduction in fungi is by spores called conidia, sporangiospores, or zoospores, which is correct.
- Statement (c): Except for yeasts, fungi are filamentous, which is correct.
- Statement (d): Coenocytic hyphae are continuous tubes filled with multinucleated cytoplasm, which is correct.

Q.139 (4)
NCERT Pg. No. 15
Saprophytic protists (slime molds):
- Form a plasmodium under suitable conditions.
- Move along decaying organic material engulfing it.
- Produce spores that are extremely resistant.
- Reproduce both asexually and sexually.
The incorrect statement is (4).

Q.140 (3)
NCERT Pg. No. 9
- Statement (1): Unicellular organisms were not separated from multicellular organisms, which is correct.
- Statement (2): Organisms with incipient nucleus were not separated from organisms with well-defined nucleus, which is correct.
- Statement (3): Thalloid plants were not separated from spermatophytes in the two-kingdom classification, which is incorrect.
- Statement (4): Autotrophic plants were placed along with fungi in the same kingdom, which is correct.
The incorrect statement is (3).

Q.141 (1)
NCERT Pg. No. 29, 30
- Statement (a): Liverworts do not have true leaves.
- Statement (b): Liverworts do not have a free-living sporophyte.
- Statement (c): Liverworts do not have true roots.
- Statement (d): Sporophyte in liverworts is differentiated into foot, seta, and capsule, which is correct.

Q.142 (2)
NCERT Pg. No.33, 34
Independent, free-living, photosynthetic gametophytes are found in, Algae and Bryophytes and Pteridophytes.

Q.143 (1)
NCERT Pg. No. 19
Both statements A and B are correct
- Statement A: Bladderwort and Venus fly trap are examples of insectivorous plants, which is correct.
- Statement B: Morels and truffles (Ascomycetes) are edible and considered delicacies, which is correct.

Q.144 (4)
NCERT Pg. No. 24
Oogamous sexual reproduction is present in Volvox but not in Fucus
- Algae are chlorophyll-bearing, simple, thalloid autotrophic organisms (1), which is correct.
- Some algae occur in association with fungi and animals (2), which is correct.
- Anisogamous sexual reproduction is present in some species of *Chlamydomonas* (3), which is correct.
- Oogamous sexual reproduction is present in both *Volvox* and *Fucus*, which makes (4) incorrect.

Q.145 (2)
NCERT Pg. No. 30
Sphagnum is used as packing material for trans-shipment of living material and provides peat, which is correct.

Q.146 (3)
NCERT Pg. No. 42
Ctenophores do not possess stinging cells.

Q.147 (2)
NCERT Pg. No. 41
Meandrina is brain coral which belongs to phylum-Coelentrata
Exclusively marine phyla are : Ctenophora, adult Echnodermata and Hemichordata.

Q.148 (2)
NCERT Pg. No. 44
Mantle - Cavity of mollusca contains a feather like structure called Ctenidial gills.

Q.149 (2)
NCERT Pg. No. 49
Reptiles are characterised by dry and cornified skin. They are oviparous and some of them lacks limbs.

Q.150 (2)

NCERT Pg. No. 45

A. *Cucumaria* - Sea cucumber

B. *Echinus* -   Sea urchin

C. *Antedon* - Sea lily

D. *Ophiura* - Brittle star

BIOLOGY-II
SECTION - A

Q.151 (4)

NCERT Pg. No. 7

• Statement (1): Each genus may have one or more than one specific epithets. This is correct because genera can have multiple species.

• Statement (2): A genus comprises a group of related species. This is correct as genus is a taxonomic category above species.

• Statement (3): A genus has more characters in common in comparison to species of other genera. This is correct as genus groups related species.

• Statement (4): Potato (*Solanum tuberosum*) and brinjal (*Solanum melongena*) belong to the same genus, Solanum. Thus, this statement is incorrect.

The correct answer is (4).

Q.152 (2)

NCERT Pg. No. 8

• Poales: Order including grasses and related families.

• Monocotyledonae: Class including monocots (plants with one seed leaf).

• Angiospermae: Class including flowering plants.

• Sapindales: Order of mango, not related to wheat.

The odd one out in taxonomic categories of wheat is (2) Sapindales.

Q.153 (4)

NCERT Pg. No. 5,6

• Statement (1): Systematics considers evolutionary relationships. This is correct.

• Statement (2): It refers to systematic arrangement of organisms. This is true.

• Statement (3): The term systematics is derived from the Latin word 'systema'. This is correct.

• Statement (4): Systematics includes identification, nomenclature, and classification. Thus, this statement is incorrect.

Q.154 (2)

NCERT Pg. No. 7

• Statement (a): Genus is a group of related species, not unrelated species, so this is incorrect.

• Statement (b): Family is a group of related genera, which is correct.

• Statement (c): Class is a group of related orders, which is correct.

• Statement (d): Order is a higher category than family, which is correct.

The correct option is (2) b, c, d.

Q.155 (1)

NCERT Pg. No. 15, 17, 18, 19

• Statement (A): The spores of slime moulds possess true cell walls and are dispersed by wind, not water.

• Statement (B): In *Agaricus*, karyogamy and meiosis occur in the basidium producing four basidiospores, which is correct.

• Statement (C): Viruses are obligate parasites, not saprophytes.

The incorrect statements are (A) and (C), so the answer is (1).

Q.156 (1)

NCERT Pg. No. 17

Dikaryophase occurs in fungi where plasmogamy (fusion of cytoplasm) is brought about by the fusion of two vegetative or somatic cells of different strains. It is observed in Ascomycetes and Basidiomycetes. Option 1 is true for Basidiomycetes

Q.157 (3)

NCERT Pg. No. 12

Coccus are spherical-shaped bacteria. Thus, the correct answer is (3).

Q.158 (3)

NCERT Pg. No. 21

Prions : In modern medicine certain infectious neurological diseases were found to be transmitted by an agent consisting of abnormally folded protein. The agent was similar in size to viruses.

Q.159 (4)

NCERT Pg. No. 16

Amoeboid protozoans, use pseudopodia for capturing prey. They do not use cilia (1), flagella (3), or have two types of nuclei (2).

Q.160 (3)

NCERT Pg. No. 18

• Statement (a): Deuteromycetes are known as imperfect fungi because only their asexual or vegetative phases are known, which is correct.

• Statement (b): They reproduce by asexual spores known as conidia, which is correct.

• Statement (c): Once their perfect sexual stages are discovered, they are moved to Ascomycetes or Basidiomycetes, which is correct.

• Statement (d): The mycelium is septate and branched, not unbranched.

The correct statements are (a), (b), and (c), so the answer is (3).

Q.161 (1)

NCERT Pg. No. 11

Both statement 1 and statement 2 are correct
- Statement 1: Kingdom Protista brought together unicellular algae like *Chlamydomonas*, *Chlorella* with protozoans like *Paramecium* and *Amoeba*, which is correct.
- Statement 2: Unicellular eukaryotic organisms were placed in Kingdom Protista by Whittaker, which is correct.

Both statements are correct, so the answer is (3).

Q.162 (3)

NCERT Pg. No. 24

Cytotaxonomy includes the study of:
- Chromosome number (1)
- Chromosome behavior (2)
- Chromosome structure (4)

It does not include DNA sequence analysis, which falls under molecular taxonomy. Thus, the answer is (3).

Q.163 (1)

NCERT Pg. No. 24, 32

- Statement A: In gymnosperms, male and female gametophytes do not have an independent free-living existence, which is correct.
- Statement B: In numerical taxonomy, each character is given equal importance, which is correct.

Thus, the correct answer is (1).

Q.164 (4)

NCERT Pg. No. 18

Both *Neurospora* and *Claviceps* form:
Exogenous asexual spores (conidia).
Endogenous sexual spores (ascospores).
Thus, the correct answer is (4).

Q.165 (3)

NCERT Pg. No. 29

- Statement (1): The plant body is attached to the substratum by unicellular or multicellular rhizoids, which is correct.
- Statement (2): They possess stem-like and leaf-like structures, which is correct.
- Statement (3): The sporophyte is dependent on the gametophyte and not always free-living or photosynthetic, which is incorrect.
- Statement (4): The zygote does not undergo reduction division immediately, which is correct.

The incorrect statement is (3).

Q.166 (2)

NCERT Pg. No. 33

In gymnosperms, the reduced male gametophyte confined to a limited number of cells is called the pollen grain.

Q.167 (4)

NCERT Pg. No. 32, 33

- Gymnosperms have vascular tissue, which is correct.
- Megasporophylls are compactly arranged to form female strobili, which is correct.
- Microsporophyll are compactly arranged on a central axis to form a male strobili, which is correct.
- Cycas has unbranched stems, not branched, which is incorrect.

The incorrect statement is (4).

Q.168 (4)

NCERT Pg. No. 32

- *Pinus* has branched stems (1), which is correct.
- Roots of *Pinus* have a fungal association in the form of mycorrhiza (2), which is correct.
- The male and female reproductive structures are borne on the same tree (3), which is correct.
- Coralloid roots are associated with nitrogen-fixing cyanobacteria, not blue-green algae (4), which is incorrect.

Q.169 (3)

NCERT Pg. No. 29, 32, 34

- Coralloid roots: Associated with nitrogen-fixing cyanobacteria, which is correct.
- Bryophytes: called amphibians of the plant kingdom, which is correct.
- Gymnosperms: are heterosporous, producing both microspores and megaspores, not homosporous, which is incorrect.
- Angiosperms: Non-archegoniate phanerogams because antheridia and archegonia are absent, which is correct.

The incorrect pair is (3).

Q.170 (4)

NCERT Pg. No. 15

- Statement A: Dinoflagellates have two flagella, one longitudinal and one transverse, which is correct.
- Statement B: Dinoflagellates undergo rapid multiplication causing red tides, which is correct.

Q.171 (1)

NCERT Pg. No. 29

Assertion: Bryophytes are of great ecological importance, which is true.

Reason: Bryophytes help in colonization (succession) on bare rocks/soil, which is true and explains the assertion

Q.172 (2)

NCERT Pg. No. 30, 31, 32

- *Selaginella* and *Pinus* (1) are seed producers.

- *Funaria* and *Polytrichum* (2) are bryophytes and not seed producers.
- *Cycas* and *Polysiphonia* (3) are seed producers.
- *Cedrus* and *Ginkgo* (4) are seed producers.

Q.173   (2)

Q.174   **(1)**

Q.175   (1)
NCERT Pg. No. 43
In phylum Aschelminthes, complete alimentary canal with well developed muscular pharynx was observed first.

Q.176   (4)
NCERT Pg. No. 50
a. *Corvus*- Pneumaticbones
b. *Calotes*-Crawling mode of locomotion

c. *Ornithorhynchus*-Homoiothermous

d. *Pteropus*-Flying fox

Q.177   (3)
NCERT Pg. No. 44, 45
Scolidon is dog fish which is chondrichthyes.
Cuttle fish - Sepia ⎫
Dervil fish - Octopus ⎬ Mollusca
Star fish - Asterias]- Echinodermata

Q.178   (2)
NCERT Pg. No. 45
Echinodermata are not acoelomates. They are Schizocoelomates.

Q.179   (3)
NCERT Pg. No. 46
Central nervous system is present in both chordates as well as non-chordates. In chordates, Nerve cord is dorsal, single hollow.
In non-chordates, Nerve cord is ventral, double solid.

Q.180   (2)
NCERT Pg. No. 48
Scoliodon, Pristis - Chondrichthyes
Exocoetus - Osteichthyes
Osteichthyes have terminal mouth.

Chondrichthyes have terminal mouth.

Q.181   (3)
NCERT Pg. No. 45
Hemichordates have a rudimentary structure in the collar region called stomochord, a structure similar to notochord.

Q.182   (4)
NCERT Pg. No. 41
Adamsia (Sea - anemona) exists as polyp.
Obleia exhibits alternation of generation.

Q.183   **(3)**
NCERT Pg. No. 40, 41, 42
Cnidoblast - Coelenterata
Collar cell - Ctenophora
Ascaris - Aschelminthes

Q.184   (1)
NCERT Pg. No. 49
3-Chambered heart - Frog, *Chelone*
4-Chambered heart - *Crocodile*

Q.185   (2)
NCERT Pg. No. 41
In *Obelia*, metagenesis is found, polyp forms medusa asexually medusa forms polyp sexually.

   SECTION-B
Q.186   (1)
NCERT Pg. No. 5, 6
- Statement (a): Higher the category, greater is the difficulty of determining the relationship to other taxa at the same level. This is correct because higher taxonomic categories encompass a broader range of organisms, making relationships harder to ascertain.
- Statement (b): Class is a group of related divisions. This is incorrect; class is a group of related orders.
- Statement (c): In a binomial name, the name of the author appears after the specific epithet. This is correct.
- Statement (d): Taxonomic studies of various species are useful in agriculture, forestry, industry, and in knowing our bio-resources and their diversity. This is correct.
Therefore, the correct option is (1) Only a, c and d are correct.

Q.187   (1)
NCERT Pg. No. 5
Human beings uniquely possess self-consciousness, the ability to reflect on themselves and their existence. Reproduction (2), cellular organization (3), and metabolism (4) are common to many living organisms.

Q.188   (3)
NCERT Pg. No. 20

• Statement (1): No virus contains both RNA and DNA, which is correct.

• Statement (2): Bacteriophages are usually double-stranded DNA viruses, which is correct.

• Statement (3): Plant viruses (not animal viruses) are usually single-stranded RNA viruses, which is incorrect.

• Statement (4): Influenza in humans is caused by a virus, which is correct.

Q.189 (4)
NCERT Pg. No. 20, 21
• Potato spindle tuber disease is caused by viroids.
• Small pox is caused by a virus.
• Mad cow disease is caused by prions.
• Tobacco mosaic disease is caused by a single-stranded RNA virus, not dsDNA.
The mismatched pair is (4).

Q.190 (3)
NCERT Pg. No. 15, 21
• Phycobiont partner of lichens: Usually a member of Chlorophyceae or a blue-green alga, which is correct.
• Prions: Causative agents of Bovine spongiform encephalopathy, which is correct.
• *Neurospora*: Used extensively in genetics and biochemistry, not considered a weed.
• Euglenoid: Has a proteinaceous pellicle, which is correct.
The incorrect pair is (3).

Q.191 (4)
NCERT Pg. No. 26
• Green algae have storage bodies called pyrenoids containing protein besides starch (1), which is correct.
• The major pigments are chlorophyll a and b (2), which is correct.
• *Volvox* is colonial, and *Ulothrix* is filamentous (3), which is correct.
• They reproduce sexually by both motile and non-motile gametes, not just non-motile (4), which is incorrect.

Q.192 (1)
NCERT Pg. No. 24
• Statement I : *Volvox* and *Eudorina* are colonial forms of algae, while *Spirogyra* and *Ulothrix* are filamentous, which is correct.
• Statement II : Algae reproduce by vegetative, asexual, and sexual methods, which is correct.
Both statements are correct, so the answer is (3).

Q.193 (2)
NCERT Pg. No. 28, 29
The gametophyte of bryophytes requires a humid, damp, and shady place to grow.

Q.194 (4)
NCERT Pg. No. 32
• **Assertion (A):** *Selaginella* and *Salvinia* are heterosporous, not homosporous, so the assertion is false.
• **Reason (R):** Pteridophytes that produce similar kinds of spores are known as homosporous, which is true. Thus, the correct answer is (4).

Q.195 **(4)**
NCERT Pg. No. 28, 29
The species shown in the diagram (Sphagnum) has the following characteristics:
• I: It is *Sphagnum*.
• II: It belongs to mosses.
• III: It is a gametophyte.
• IV: It provides peat used as fuel.
All the mentioned characteristics are correct, so the answer is (4).

Q.196 (3)
NCERT Pg. No. 40
In porifera fertilisation is internal and development is indirect.
Water enters through minute pores (ostia) in the body wall into a central cavity, spongocoel, from where it goes out through the osculum.
The body is supported by a skeleton made up of spicules or spongin fibres.

Q.197 (3)
NCERT Pg. No. 47
Carcharodon is great white shark belonging to class-Condrichthyes. They are ovoviviparous.

Q.198 (1)
Q.199 (3)
NCERT Pg. No. 48, 50
(A) Proboscis gland-*Balanoglossus*
(B) Cnidocytes- *Aurelia*
(C) Electric organs-*Torpedo*
(D) Air sacs- *Psittacula*

Q.200 (3)
NCERT Pg. No. 49
The given figure shows a Reptile, Chameleon.

Chameleon

Crocodile is an exception among reptiles having 4-chambered heart.