ANSWER KEY
NEET (FINAL TRACK)
PART TEST-02 (XI)

PHYSICS

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

CHEMISTRY

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

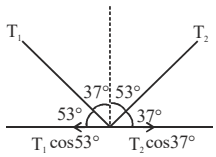
BIOLOGY

Q.101 (3)	**Q.102** (4)	**Q.103** (2)	**Q.104** (2)	**Q.105** (2)	**Q.106** (3)	**Q.107** (2)	**Q.108** (2)	**Q.109** (4)	**Q.110** (4)
Q.111 (4)	**Q.112** (1)	**Q.113** (3)	**Q.114** (4)	**Q.115** (2)	**Q.116** (4)	**Q.117** (4)	**Q.118** (1)	**Q.119** (4)	**Q.120** (4)
Q.121 (4)	**Q.122** (4)	**Q.123** (2)	**Q.124** (3)	**Q.125** (2)	**Q.126** (4)	**Q.127** (3)	**Q.128** (3)	**Q.129** (2)	**Q.130** (3)
Q.131 (2)	**Q.132** (3)	**Q.133** (4)	**Q.134** (1)	**Q.135** (4)	**Q.136** (1)	**Q.137** (3)	**Q.138** (2)	**Q.139** (4)	**Q.140** (2)
Q.141 (3)	**Q.142** (3)	**Q.143** (4)	**Q.144** (4)	**Q.145** (3)	**Q.146** (3)	**Q.147** (1)	**Q.148** (2)	**Q.149** (3)	**Q.150** (1)
Q.151 (2)	**Q.152** (3)	**Q.153** (1)	**Q.154** (1)	**Q.155** (1)	**Q.156** (2)	**Q.157** (3)	**Q.158** (2)	**Q.159** (4)	**Q.160** (2)
Q.161 (1)	**Q.162** (4)	**Q.163** (2)	**Q.164** (4)	**Q.165** (1)	**Q.166** (1)	**Q.167** (1)	**Q.168** (1)	**Q.169** (3)	**Q.170** (2)
Q.171 (3)	**Q.172** (3)	**Q.173** (2)	**Q.174** (4)	**Q.175** (1)	**Q.176** (2)	**Q.177** (2)	**Q.178** (2)	**Q.179** (4)	**Q.180** (2)
Q.181 (3)	**Q.182** (3)	**Q.183** (2)	**Q.184** (2)	**Q.185 (3)**	**Q.186** (4)	**Q.187** (4)	**Q.188** (2)	**Q.189** (1)	**Q.190** (1)
Q.191 (3)	**Q.192** (4)	**Q.193** (1)	**Q.194** (4)	**Q.195** (4)	**Q.196** (2)	**Q.197** (3)	**Q.198** (2)	**Q.199** (2)	**Q.200** (3)

SOLUTIONS

PHYSICS

Q.1 (3)

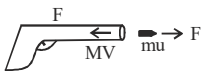


Balancing force along x

$T_1\cos53° = T_2\cos37°$

$\Rightarrow T_1 \frac{3}{5} = T_2 \frac{4}{5} \Rightarrow \frac{T_1}{T_2} = \frac{4}{3}$

Q.2 (2)



$\int F dt = m\vec{u}$ and $\int F dt = M\vec{V}$

Due to momentum conservation,

$m\vec{u} + M\vec{V} = 0$

$\Rightarrow \vec{v} = -\frac{m\vec{u}}{M} \Rightarrow$ Negative sign implies gun recoil back.

Q.3 (4)

While moving up :

$T_{up} - mg = ma$

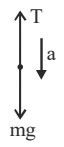
$\Rightarrow T_{up} = m(a+g) = 30\,(4+10) = 420N$

While moving down :

$mg - T = ma$

$\Rightarrow \quad T = m(g-a)$

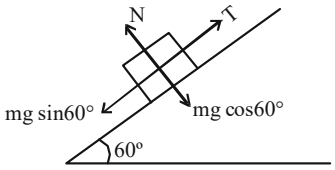
$= 30\,(10-2) = 240$ N



As $T_{up} > T_{max}$

$\Rightarrow$ Rope will break while while moving upward

Q.4 (1)



Balancing forces perpendicular to the incline plane :

$N = mg\cos 60° = 10 \times 10 \times \frac{1}{2} = 50N$

Q.5 (2)

Force, $\vec{F} = \frac{m d\vec{v}}{dt}$

Slope of graph = $\frac{dv}{dt}$ = Zero

$\Rightarrow$ Force = Zero

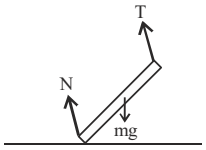
Q.6 (4)

$a = \frac{10}{10} = 1\ m/s^2$

Net force acting on 2 kg block = 2(1) = 2N

Q.7 (3)

Normal force acts perpendicular to surface. So,



Q.8 (4)

Reading of spring balance is tension developed.

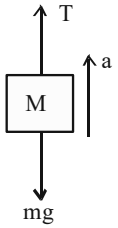
Applying Newton's law :

$T - mg = ma$

$\Rightarrow T = m(a+g)$

Mass recorded = $\frac{T}{g} = m\left(\frac{a+g}{g}\right)$

$= m\left(1+\frac{a}{g}\right) kg - wt$



Q.9 (1)

Frictional force between block and surface is

$F = \mu R = 0.5 \times 10 \times 10 = 50\ N$

Applied force is 10 N and it is less than 50 N

$\therefore$ System is at rest and no friction between A and B

Q.10 (2)

For motion $F \geq f_{max}$

$4t \geq \mu_s Mg$

$4t \geq 0.4(10)(10)$

$t \geq 10\,sec$ Hence t_{min} = 10 sec.

Q.11 (3)

As acceleration of the box is due to static friction,

$\therefore ma = f_s \leq \mu_s N = \mu_S mg$

$a \leq \mu_S g$

$\therefore a_{max} = \mu_S g = 0.2 \times 10\ ms^{-2} = 2\ ms^{-2}$

Q.12 (4)

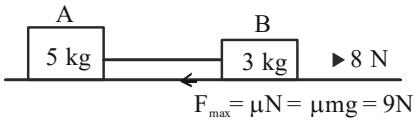
$F_c = \sqrt{f^2 + N^2}$

$= \sqrt{(\mu mg\cos\theta)^2 + (mg\cos\theta)^2}$

$= \sqrt{\left(0.5\times 2\times 10\times\frac{\sqrt{3}}{2}\right)^2 + \left(2\times 10\times\frac{\sqrt{3}}{2}\right)^2}$

$= \sqrt{75+300} = \sqrt{375}N = 5\sqrt{15}N$

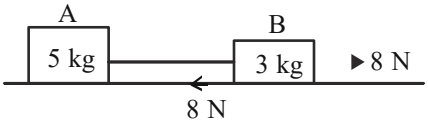
Q.13 (1)



$F_{max} = \mu N = \mu mg = 9N$

Friction available = 9N

Friction required = 8N

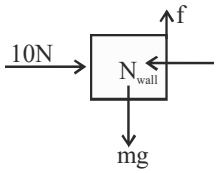


Friction is sufficient to make 3 kg stationary

$\Rightarrow$ Tension = zero

Q.14 (4)

Normal force from wall = 10N



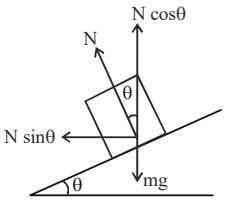
$f_{max} = \mu N$

$= 0.2 \times 10 = 2N$

As block is just on verge of slipping,

$\Rightarrow f_{max} = mg \Rightarrow mg = 2N$

Q.15 **(2)**



$N\sin\theta = \frac{mv^2}{R}$

$N\cos\theta = mg$

$\Rightarrow \tan\theta = \frac{v^2}{Rg} = \frac{30\times 30}{900\times 10} = \frac{1}{10}$

$\Rightarrow \tan\theta = \frac{1}{10} \Rightarrow \theta = \tan^{-1}\left(\frac{1}{10}\right)$

Q.16 (1)

The limiting friction remains same in both the cases.

$$\therefore \omega_1^2 r_1 = \omega_2^2 r_2 \left\{\begin{matrix}\text{Centripetal acceleration} \\ \text{at slipping will be same}\end{matrix}\right\}$$

$$\Rightarrow \omega^2 \times 4\text{cm} = (2\omega)^2 r_2 \Rightarrow \boxed{r_2 = 1\text{cm}}$$

Q.17 **(2)**

$T\sin\theta = mr\omega^2$

$$\Rightarrow T.\frac{r}{\ell} = mr\omega^2$$

$$\Rightarrow T = m\ell\omega^2 = \frac{100}{1000}\times 1\times\left(2\pi\times\frac{2}{\pi}\right)^2 = 1.6\text{N}$$

Q.18 (3)

$W = \vec{F}.\vec{S}$

$W = NS\cos 0°$

$$= M(g+a)\times S\times 1 = M(g+a)\times\left(\frac{1}{2}aT^2\right)$$

Q.19 (4)

$$KE = \frac{1}{2}mv^2 = 9000$$

$$\Rightarrow \frac{1}{2}\times 20\times v^2 = 9000$$

$\Rightarrow v^2 = 900 \Rightarrow v = 30$ m/s

Applying impulse-momentum equation :

$F\Delta t = \Delta p \Rightarrow -\mu mg(6) = 0 - mv$

$\Rightarrow -\mu mg(6) = -mv \Rightarrow \mu mg(6) = mv$

$$\Rightarrow \mu 6\times 10 = v = 30 \Rightarrow \mu = \frac{1}{2}$$

Q.20 (2)

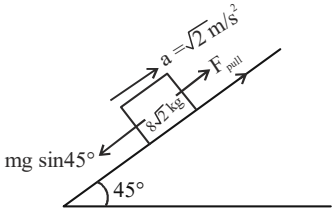
Applying energy conservation between A and B

$KE_A + U_A = KE_B + U_B$

$\Rightarrow 0 + mg(30) = \frac{1}{2}mv^2 + mg(10)$

$\Rightarrow v^2 = 2g(30-10) = 20\times 20 \Rightarrow v = 20$ m/s

Q.21 **(2)**



$F_{pull} - mg\sin 45 = ma$

$$\Rightarrow F - \frac{mg}{\sqrt{2}} = \sqrt{2}m$$

$$\Rightarrow F = m\left(\sqrt{2}+5\sqrt{2}\right) = 6\sqrt{2}m$$

$\Rightarrow F = 6\sqrt{2}\times 8\sqrt{2} = 96$ N

Velocity = $v = u + at = 0 + at$

$V = \sqrt{2}\ \sqrt{8} = 4$ m/s

Power = $\vec{F}.\vec{V} = FV = 96\times 4 = 384$ w

Q.22 **(3)**

From work energy theorem

$WD = \Delta KE = KE_f - KE_i$

$$\Rightarrow WD = \frac{1}{2}m\left(v_f^2 - v_i^2\right)$$

$$= \frac{1}{2}\left(\frac{200}{1000}\right)\left(10^2 - 20^2\right) = \frac{1}{2}\times\frac{1}{5}(-300) \Rightarrow WD = -30\text{ J}$$

Q.23 **(1)**

By definitio of conservative force, workdone by conservative force in a closed path is zero. Also spring force is a conservative force

$\Rightarrow$ Workdone by spring force in a closed path is zero.

Q.24 (1)

Workdone = $WD = \int F dx$

$$= \int_0^2\left(7-2x+3x^2\right) = \left(7x - \frac{2x^2}{2} + \frac{3x^3}{3}\right)_0^2$$

$= (14 - 4 + 8) = 18$ J

Q.25 (3)

Energy is the ability of a body to do work. Energy should be transferred to an object in order to move it. So, energy is the cause for doing work. Both energy and power are scalar quantity.

Q.26 (1)

Conservative force,

$$\vec{F} = \frac{-dU}{dx}\hat{i} - \frac{dU}{dy}\hat{j}$$

$$F_x = \frac{-dU}{dx} = 2\hat{i} \Rightarrow F_y = \frac{-dU}{dy} = -2\hat{j}$$

$$\left|\vec{F}\right| = \sqrt{F_x^2 + F_y^2} = 2\sqrt{2}\text{N}$$

Q.27 (2)

$$W = \text{Area} = 3\times 4 + \frac{1}{2}\times 16\times 3$$

$= 12 + 24 = 36$ J

Q.28 (1)

$$\text{At A :- } N_A - mg = \frac{mv^2}{r_A}$$

$$N_A = mg + \frac{mv^2}{r_A}$$

At C :- $N_C - mg = \frac{mv^2}{r_C}$

$$N_C = mg + \frac{mv^2}{r_C}$$

since, $r_C > r_A \ \therefore N_A > N_B$

Q.29 **(2)**

at $x = x_2, F = 0$

$\frac{dF}{dx} < 0$ (for stable equilibrium)

Q.30 (3)

From work - energy theorem,

$WD_{Net} = \Delta KE = KE_f - KE_i$

$= \frac{1}{2}m\left(V_f^2 - V_i^2\right) = \frac{m}{2}\left((-1)^2 - 1^2\right) = \text{zero}$

Also, slope of position - time graph gives velocity

$\Rightarrow$ Velocity at t = 0 is slope $= \frac{2-0}{2-0} = 1$

and velocity at t = 4 is slope $= \frac{0-2}{4-2} = -1$

Q.31 (3)

$m_1 = 16$ kg, $m_2 = 4$ kg, $v_1 = 2t_1$, $v_2 = 8t_2$.

As given after time t_1 & t_2 kinetic energy of bodies are same.

$$\Rightarrow \frac{1}{2}m_1v_1^2 = \frac{1}{2}m_2v_2^2 \Rightarrow m_1v_1^2 = \frac{1}{2}m_2v_2^2$$

$$\Rightarrow 16\left(2t_1\right)^2 = 4\left(8t_2\right)^2$$

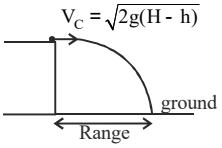
$$\Rightarrow \left(\frac{2t_1}{8t_1}\right)^2 = \frac{4}{16} \Rightarrow \left(\frac{t_i}{4t_2}\right)^2 = \frac{1}{4}$$

$$\Rightarrow \frac{t_1}{4t_2} = \frac{1}{2} \Rightarrow \frac{t_1}{t_2} = \frac{4}{2} = \frac{2}{1}$$

Q.32 (3)

From energy conservation,

$V_C = \sqrt{2g(H-h)}$



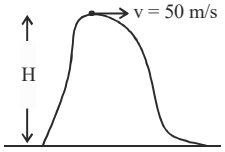
Time of flight $= \sqrt{\frac{2h}{g}}$

Range, $x = V_C T = \sqrt{2g(H-h)}\sqrt{\frac{2h}{g}} = 2\sqrt{(H-h)h}$

For maximum range $h = \frac{H}{2} \Rightarrow$ Range $= 2\sqrt{\frac{H}{2}\frac{H}{2}} = H$

Q.33 (2)

From energy conservation,



$$mgH + \frac{1}{2}m(50)^2 = 0 + \frac{1}{2}mv^2$$

$\Rightarrow v^2 = (50)^2 + 2gh$

$\Rightarrow v = \sqrt{2500 + 1100} = \sqrt{3600} = 60\,m/s$

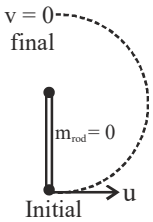
Q.34 (3)

Workdone by gravity = –mgh

As point of contact between rope and hand is at rest, so workdone by tension= zero.

Although tension force is acting but tension is doing zero work.

Q.35 (2)



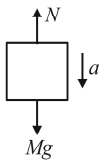
Applying energy conservation between initial and final position,

$$\frac{1}{2}mu^2 + 0 = mg(2l) + 0 \Rightarrow u = \sqrt{4gl}$$

SECTION-B

Q.36 (3)

FBD of block



$Mg - N = Ma$

$N = \frac{Mg}{5}$ So,

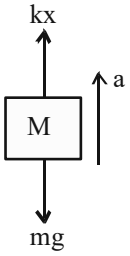
$$a = \frac{Mg - \frac{Mg}{5}}{M} = 0.8g$$

Q.37 (2)

Spring force, $F_{sp} = kx$

Where x = Elongation from natural length

$$\Rightarrow \quad x = \frac{mg}{4k} + \frac{mg}{k} = \frac{5}{4}\frac{mg}{k}$$



Applying Newton's law :

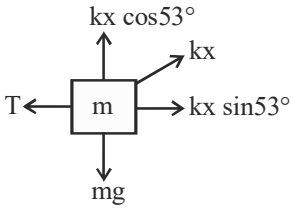
$$kx - mg = ma$$

$$\Rightarrow \quad k\frac{5}{4}\frac{mg}{k} - mg = ma$$

$$\Rightarrow \frac{5}{4}mg - mg = ma \Rightarrow \frac{mg}{4} = ma \Rightarrow a = \frac{g}{4}$$

Q.38 (2)

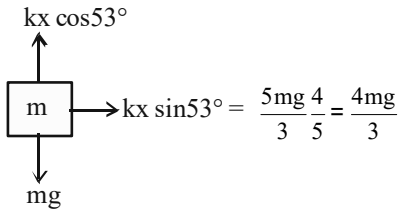
Before spring is cut



From force balance, $kx\cos53° = mg$

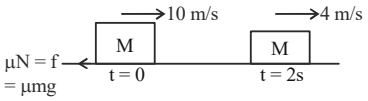
$$\Rightarrow kx\frac{3}{5} = mg \Rightarrow kx = \frac{5mg}{3}$$

Once string cuts,



$$\Rightarrow \text{acceleration} = \frac{4mg}{3m} = \frac{4g}{3}$$

Q.39 (2)



Retardation, $a = -\mu g = \frac{\vec{v}_f - \vec{v}_i}{\Delta t}$

$$\Rightarrow -\mu g = \frac{4-10}{2} = -3 \Rightarrow \mu = 0.3$$

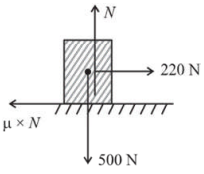
Q.40 (1)

The plane is to be inclined at angle of repose

$\theta = \tan^{-1}(\mu) = 30°$

Q.41 (2)

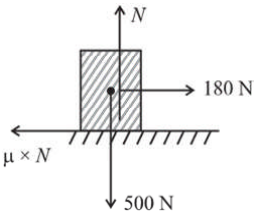
For limiting equilibrium of body



$220 = \mu_s \times 500$

$$\mu_s = \frac{200}{500} = 0.44$$

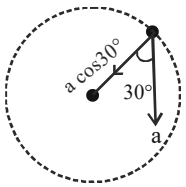
When object moving at constant velocity



$180 = \mu_k \times 500$

$$\therefore \mu_k = \frac{180}{500} = 0.36$$

Q.42 (1)

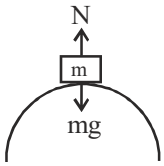


$$a_{centripetal} = \frac{v^2}{R} \Rightarrow a\cos30° = \frac{v^2}{R} \Rightarrow 15\times\frac{\sqrt{3}}{2} = \frac{v^2}{2.5}$$

$$\Rightarrow v^2 = 15\times\frac{\sqrt{3}}{2}\times 2.5 = 32.475$$

$$\Rightarrow v = \sqrt{32.475} = 5.7\,m/s$$

Q.43 (2)



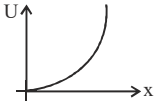
$$mg - N = \frac{mv^2}{R}$$

As $N = 0$

$$\Rightarrow mg = \frac{mv^2}{R} \Rightarrow v = \sqrt{Rg} = \sqrt{400} \Rightarrow v = 20\ m/s$$

Q.44 (1)

$$U = \frac{1}{2}kx^2$$



Q.45 (2)

Potential energy, U can be positive, negative or zero.

Kinetic energy is always positive.

Also, total mechanical energy = U + K

Combinations possible are U < E, K > E and K< E

Q.46 (2)

Energy availble at B
= 5% of energy at A

$$\Rightarrow \frac{1}{2}mv^2 = \left(\frac{5}{100}\right) \times mgh$$

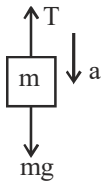
$$\Rightarrow v^2 = \frac{1}{10}gh = \frac{10 \times 4}{10} = 4 \Rightarrow v = 2 \text{ m/s}$$

Q.47 (1)

Applying Newton's law,

$$mg - T = ma$$

$$\Rightarrow \quad T = m(g - a)$$



$$\text{Displacement} = \frac{1}{2}at^2$$

Workdone by tension = (Tension)(displacement)

$$= \vec{T} \cdot \vec{S} = T\,S\,\cos\pi = -T\,S$$

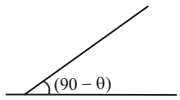
$$= -m(g - a)\,\frac{1}{2} \times t^2$$

Q.48 (3)

Speed of block will be
maximum at equilibrium
position at equilibrium position,
At equilibrium position,

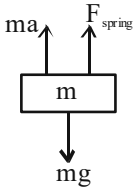
$$mg \sin(90 - \theta) = kx$$

$$\Rightarrow \quad x = \frac{mg\cos\theta}{k}$$



Q.49 (4)

FBD in lift frame
For a man inside lift,



$F_{spring} \neq 0$ but displacement of block is zero, so workdone by spring force wrt man inside lift = zero.

Q.50 (4)

$$\text{Power} = \vec{F} \cdot \vec{V} = \frac{mvdv}{dx}v$$

Slope of v–x graph is $\frac{dv}{dx} = -\tan 45° = -1$

Power = $mv^2(-1) = 2 \times 4 \times -1 = -8W$

CHEMISTRY
SECTION-A

Q.51 (1)

$ICl_3 \rightarrow 3\sigma$ - bond pair + 2 lone pair
$ICl_3 \rightarrow sp^3d$

Q.52 **(3)**

BeH_2 has incomplete octet.

Q.53 **(2)**

$H_2 \rightarrow \sigma\,1s^2$

$N_2 \rightarrow \sigma 1s^2 \overset{*}{\sigma}\, 1s^2 \sigma\, 2s^2 \overset{*}{\sigma}\, 2s^2 (\pi 2p_x^{\,2} = \pi 2p_y^{\,2})\, \sigma\, 2p_z^{\,2}$

Q.54 **(2)**

Be_2 does not exist.
It has zero bond order.

Q.55 **(2)**

$N_2 \rightarrow$ Diamagnetic
$N_2^+ \rightarrow$ Paramagnetic

Q.56 **(4)**

I_3^- has linear shape
so has 180° bond angle.

Q.57 **(4)**

SO_3 has 3σ and 3π bonds.

Q.58 **(3)**

CO^+ has 2.5 bond order.
N_2, NO^+, CN^- has 3 bond order.

Q.59 (1)

Bond enthalpy order
$\rightarrow N_2 > C_2 > B_2 > F_2$

Q.60 (2)

σ –bond is stronger
than a π-bond.

Q.61 (1)

O_2^+ has less no. of
electrons in ABMO.

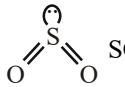
Q.62 (2)

$1s^2\,2s^2\,2p^6\,3s^1 \rightarrow$ Na
$1s^2\,2s^2\,2p^6\,3s^2\,3p^5 \rightarrow$ Cl
$1s^2\,2s^2\,2p^6\,3s^2\,3p^3 \rightarrow$ P
$1s^2\,2s^2\,2p^6\,3s^2 \rightarrow$ Mg
Atomic size →
Cl < P < Mg < Na

Q.63 (4)

XeF_2 has linear shape
and has 3 lone pair.

Q.64 (1)
HF has strong H-bonding.
So least Volatile in nature.

Q.65 (4)

SO_2 has bent shape
and $BeCl_2$ has linear shape.

Q.66 (3)
XeF_4 molecule have 4 σ B.P + 2 L.P = sp^3d^2 hybridisation has square planer shape.

Q.67 (4)
$C_2 \rightarrow \sigma 1s^2 \overset{*}{\sigma}\ 1s^2\ \sigma 2s^2\ \overset{*}{\sigma}\ 2s^2\ (\pi 2p_x^{\ 2} = \pi 2p_y^{\ 2})$
B. O = 2
$C_2 \rightarrow$ contains $\rightarrow$ 2 π bond.

Q.68 (1)
Cl has most negative
electron gain enthalpy.

Q.69 (1)
Facts

Q.70 (4)
$NH_3, PCl_3 \rightarrow$ Trigonal pyramidal
$CO_2, XeF_2 \rightarrow$ Linear
$BCl_3, SO_3 \rightarrow$ Trigonal planar

Q.71 (4)
$NF_3 \rightarrow$ Trigonal pyramidal
$H_2O > H_2S \rightarrow$ Dipole moment order

Q.72 (1)

$$\text{Heat capacity} = \frac{\text{heat transfer(q)}}{\Delta T}$$

For adiabatic process
heat transfer is zero;
So heat capacity = 0

Q.73 (2)
Enthalpy of hydration is the amount of heat change when 1 mole of an anhydrous salt gets hydrated by fixed amount of water to form hydrated salt.

Q.74 (3)
Reactions for which $\Delta ng > 0$ have positive entropy change.

Q.75 (4)
For non-spotaneous reaction
$\Delta G > 0$

$$\Delta H - T\Delta S > 0$$

$$\Delta H > T\Delta S$$

$$T < \frac{\Delta H}{\Delta S} \Rightarrow T < \frac{30}{0.07} \Rightarrow T < 428.57\ K$$

Q.76 (1)
For an ideal gas internal energy depends on temperature only so change in internal energy is zero for isothermal process.

Q.77 (2)
For reversible isothermal process:

$$W = -2.303\ nRT \log_{10} \frac{P_1}{P_2}$$

$$W = -2.303 \times 1 \times 8.3 \times 300 \times \log_{10} \frac{1}{5}$$

W = 4008 Joule
W = 4.01 kJ

Q.78 (4)
For an isolated system
q = 0, w = 0; so according to FLOT
$\Delta E = q + w = 0$

Q.79 **(1)**
Entropy of graphite is more than diamond so ΔS is +ve for conversion of diamond into graphite.
In (2) and (3) Δn_g decreases so Δs is –ve

Q.80 (4)
The average bond enthalpy of

$$[O-H] = \frac{498 + 428}{2} = 463\ kJ\ mol^{-1}$$

Q.81 (2)
Combustion reaction
of ethanol is given as
$C_2H_5OH(\ell) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(\ell)$
$\Delta ng = 2 - 3 = -1$
$\Delta U = -670.48\ kcal\ mol^{-1}$
$\Delta H = \Delta U + \Delta ngRT$
$\Delta H = -670.48 + (-1) \times 2 \times 10^{-3} \times 300 = -670.48 - 0.6$
$\Delta H = -671.08\ kcal\ mol^{-1}$

Q.82 **(1)**
Enthalpy is an extensive property

Q.83 **(2)**
For an ideal gas: internal energy depend on temperature only so in isothermal process change in internal energy is zero.

Q.84 **(1)**
Volume, heat capacity, Gibb's energy and internal energy, these properties are extensive.

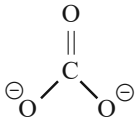
Q.85 (2)
Reaction of combustion of CH_4 is given by
$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(\ell)$
$\Delta H = \left[\left(\Delta_f H\right)_{CO_2(g)} + 2\times\left(\Delta_f H\right)_{H_2O}\right] - \left(\Delta_f H\right)_{CH_4}$
$= [-y + 2\times(-z)] - (-x) = x - y - 2z$

SECTION-B

Q.86 (2)
C_2 contains only 2π bond.

Q.87 (2)
$N_2 \rightarrow \sigma1s^2\,\overset{*}{\sigma}1s^2\sigma2s^2\,\overset{*}{\sigma}2s^2(\pi2p_x^2=\pi2p_y^2)\sigma\,2p_z^2$
$N_2^+ \rightarrow \sigma1s^2\,\overset{*}{\sigma}1s^2\sigma2s^2\,\overset{*}{\sigma}2s^2(\pi2p_x^2=\pi2p_y^2)\sigma\,2p_z^1$
$O_2 \rightarrow \sigma1s^2\,\overset{*}{\sigma}\,1s^2\,\sigma\,2s^2\,\overset{*}{\sigma}\,2s^2\,\sigma\,2p_z^2(\pi2p_x^2 = \pi2p_y^2)\,(\overset{*}{\pi}\,2p_x^1$
$= \overset{*}{\pi}\,2p_y^1)$
N_2^+ and O_2 both are paramagnetic species.

Q.88 **(4)**



avg. bond order $= \dfrac{\text{total bond}}{\sigma - \text{bond}} = 4/3 = 1.33$

Q.89 **(3)**
$\ddot{N}H_3 \rightarrow$ Trigonal pyramidal
$:\ddot{B}rF_3 \rightarrow$ Bent T-shape
$BF_3 \rightarrow$ Trigonal planar
$SF_4 \rightarrow$ See-saw shape

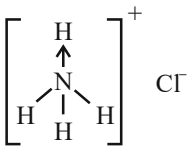
Q.90 **(4)**

Bond order $\propto \dfrac{1}{\text{Bond length}}$

Bond length $\rightarrow$ $CO < CO_2 < CO_3^{2-}$

Q.91 (3)
I_3^- is linear in shape.
I_3^- has 2 σ B.P. + 3 lone pair
so it has sp^3d hybridisation.

Q.92 (2)



Q.93 **(4)**
Formatin of atomic chlorine involve breaking of covalent bond.

Q.94 (3)
$(p-p)\sigma > (s-p)\sigma > (s-s)\sigma > (p-p)\pi$

Q.95 (2)
$C + O_2 \rightarrow CO_2$; $\Delta H° = -x$ .....(i)
$2CO + O_2 \rightarrow 2CO_2$; $\Delta H° = -y$ .....(ii)
reaction of formation of carbon monoxide is
$C(s) + 1/2\,O_2(g) \rightarrow CO(g)\ \Delta H = ?$
On applying (i) $-\dfrac{ii}{2}$; we get formation equation of CO
So, $\Delta H = -x - \left(\dfrac{-y}{2}\right) = \dfrac{y-2x}{2}$

Q.96 (1)
$H_2O(s) \rightleftharpoons H_2O(\ell)$
$T = 273\ K$
$\Delta H = 6.0\ kJ\ mol^{-1}$
$\Delta S = \dfrac{\Delta H}{T}$
$\Delta S = \dfrac{6\times1000}{273}\ J\,k^{-1}\,mol^{-1}$
$\Delta S = 21.98\ J\,k^{-1}\,mol^{-1}$

Q.97 (4)
Given
$BaCl_2(s) + aq \rightarrow BaCl_2(aq)$
$\Delta H = -20\ kJ/mol$ ....(i)
$BaCl_2.2H_2O(s) + aq \rightarrow BaCl_2(aq)$
$\Delta H = 8\ kJ/mol$ ...(ii)
$BaCl_2(s) + 2H_2O \rightarrow BaCl_2.2H_2O$; $\Delta H = ?$
applying (i) – (ii); we get target equation
$\Delta H = -20 - 8 = -28\ kJ\ mol^{-1}$

Q.98 (3)
$\Delta_{vap}S = \dfrac{\Delta_{vap}H}{T} = \dfrac{2.257\times18\times1000}{373}$
$= 108.9JK^{-1}$

Q.99 (2)
Spontaneous process is an irreversible process and may be reversed by some external agency.
The given statement is true because spontaneous reactions are irreversible as they can proceed on their own, but to proceed their reverse reaction it will need some external agency, as it can not take place on its own.
Analyzing the reason spontaneous process is an irreversible process and may be reversed by some external agency a process is spontaneous when $\Delta G < 0$.
$\Delta G = \Delta H - T\Delta S$

When $\Delta H < 0$, it may lead to negative valve for ΔG and thus it is contributing factor for spontaneity and the statement is correct, but it is not the correct explanation of the given assertion.

Q.100 (4)

$H_2O(\ell) \rightleftharpoons H_2O(g)$

at 100°C and 1 atm the given process is in equilibrium and at equilibrium $\Delta G = 0$

$\Delta H - T\Delta S = 0$;

so, $\Delta H = T\Delta S$

BIOLOGY-I
SECTION-A

Q.101 (3)

New NCERT Pg. No. 63

Brinjal → Hypogymous flowers.

Q.102 (4)

Old NCERT Pg. No. 71

Tendrils in pear are modified leaves.

Q.103 (2)

New NCERT Pg. No. 62

When a flower can be divided into two equal radial halves in any radial plane passing through the centre, it is said to be actinomorphic, e.g., mustard, *datura*, chilli.

Q.104 (2)

New NCERT Pg. No. 65

In parietal placentation, the ovules develop on the inner wall of the ovary or on peripheral part.

Ovary is one-chambered but it becomes twochambered due to the formation of the false septum, e.g., mustard and Argemone.

Q.105 (2)

New NCERT Pg. No. 59

The root is covered at the apex by a thimble-like structure called the root cap.

It protects the tender apex of the root as it makes its way through the soil.

These root hairs absorb water and minerals from the soil.

Q.106 (3)

Old NCERT Pg. No. 67

Topic → Modifications of root.

Q.107 (2)

New NCERT Pg. No. 61

In opposite phyllotaxy a pair of leaves arise at each node and lie opposite to each other, e.g., *Calotropis* and Guava.

If more than two leaves arise at a node and form a whorl, it is called whorted phyllotaxy, as in *Alstonia*,

Q.108 (2)

New NCERT Pg. No. 67

The outer covering of endosperm separates the embryo by a proteinous layer called aleurone layer.

Q.109 (4)

New NCERT Pg. No. 64, 65

Epiphyllous → stamens are united to perianth. e.g. → Lily

Epopetalous → stamens are united to petals. e.g. → Brinjal

Diadelphous → stamens are united in 2 bundles. e.g. → Pea

Apocarpus → free carpels e.g. → Lotus

Q.110 (4)

New NCERT Pg. No. 64

In pea and bean flowers, there are five petals, the largest (standard) overlaps the two lateral petals (wings) which in turn overlap the two smallest anterior petals (keel); this type of aestivation is known as vexillary or papilionaceous.

Q.111 (4)

New NCERT Pg. No. 65

In marginal placentation the placenta forms a ridge along the ventral suture of the ovary and the ovules are borne on this ridge forming two rows, as in pea.

Q.112 (1)

New NCERT Pg. No. 60

In some leguminous plants the leafbase may become swollen, which is called the pulvinus. The lamina or the leaf blade is the green expanded part of the leaf with veins and veinlets.

Q.113 (3)

New NCERT Pg. No. 59

A few millimetres above the root cap is the region of meristematic activity.

The cells of this region are very small, thin-walled and with dense protoplasm. They divide repeatedly.

Q.114 (4)

New NCERT Pg. No. 62, 63

When it can be divided into two similar halves only in one particular vertical plane, it is zygomorphic, e.g., pea, gulmohur, bean, *Cassia*.

In the hypogynous flower the gynoecium occupies the highest position while the other parts are situated below it. The ovary in such flowers is said to be superior, e.g.,

mustard, china rose and brinjal. If gynoecium is situated in the centre and other parts of the flower are located on the rim of the thalamus almost at the same level, it is called perigynous. The ovary here is said to be half inferior, e.g., plum, rose, peach. In epigynous flowers, the margin of thalamus grows upward enclosing the ovary completely and getting fused with it, the other parts of flower arise above the ovary. Hence, the ovary is said to be inferior as in flowers of guava and cucumber, and the ray florets of sunflower.

Q.115 (2)
New NCERT Pg. No. 76
Vascular bundles are conjoint and closed. Peripheral vascular bundles are generally smaller than the centrally located ones.

Q.116 (4)
New NCERT Pg. No. 74
The tangential as well as radial walls of the endodermal cells have a deposition of water-impermeable, waxy material suberin in the form of casparian strips.

Q.117 (4)
New NCERT Pg. No. 74, 75
The transverse section of a typical young dicotyledonous stem shows that the epidermis is the outermost protective layer of the stem. Covered with a thin layer of cuticle, it may bear trichomes and a few stomata.

Q.118 (1)
New NCERT Pg. No. 73
When xylem and phloem within a vascular bundle are arranged in an alternate manner along the different radii, the arrangement is called radial such as in roots.

Q.119 (4)
New NCERT Pg. No.
Mesophyll form ground tissue of leaves and bulliform cells are found in monocot leaf.

Q.120 (4)
Old NCERT Pg. No. 86, 87
Sclerenchyma consists of long, narrow cells with thick and lignified cell walls having a few or numerous pits. They are usually dead and without protoplasts.
These are commonly found in the fruit walls of nuts; pulp of fruits like guava, pear and sapota; seed coats of legumes and leaves of tea. Sclerenchyma provides mechanical support to organs.

Q.121 (4)
New NCERT Pg. No. 77
In grasses, certain adaxial epidermal cells along the veins modify themselves into large, empty, colourless cells. These are called bulliform cells. When the bulliform cells in the leaves have absorbed water and are turgid, the leaf surface is exposed. When they are flaccid due to water stress, they make the leaves curl inwards to minimise water loss.

Q.122 (4)
New NCERT Pg. No. 72
Each stoma is composed of two beanshaped cells known as guard cells which enclose stomatal pore. In grasses, the guard cells are dumb-bell shaped.

Q.123 (2)
New NCERT Pg. No. 76
The epidermis which covers both the upper surface (adaxial epidermis) and lower surface (abaxial epidermis) of the leaf has a conspicuous cuticle. The abaxial epidermis generally bears more stomata than the adaxial epidermis. The latter may even lack stomata.

Q.124 (3)
Old NCERT Pg. No. 101
If the columnar or cuboidal cells bear cilia on their free surface they are called ciliated epithelium. Their function is to move particles or mucus in a specific direction over the epithelium.

Q.125 (2)
Old NCERT Pg. No. 103, 104
In all connective tissues except blood, the cells secrete fibres of structural proteins called collagen or elastin.
Cartilage, bones and blood are various types of specialised connective tissues.

Q.126 (4)
Old NCERT Page No. 104
In general, muscles play an active role in all the movements of the body. Muscles are of three types, skeletal, smooth, and cardiac.

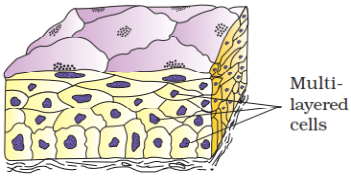
Q.127 (3)
Old NCERT Pg. No. 105
Neuroglia make up more than one half the volume of neural tissue in our body.

Q.128 (3)
Old NCERT Pg. No. 101
The squamous epithelium is made of a single thin layer of flattened cells with irregular boundaries.

They are found in the walls of blood vessels and air sacs of lungs and are involved in functions like forming a diffusion boundary.

Q.129 (2)
Old NCERT Pg. No. 102
Connective tissues are most abundant and widely distributed in the body of complex animals.
They are named connective tissues because of their special function of linking and supporting other tissues/ organs of the body.

Q.130 (3)
Old NCERT Pg. No. 102

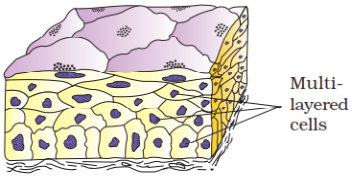


Compound epithelium
Compound epithelium is made of more than one layer (multi-layered) of cells and thus has a limited role in secretion and absorption.

Q.131 (2)
Old NCERT Pg. No. 101
If the columnar or cuboidal cells bear cilia on their free surface they are called ciliated epithelium.
Their function is to move particles or mucus in a specific direction over the epithelium. They are mainly present in the inner surface of hollow organs like bronchioles and fallopian tubes.

Q.132 (3)
Old NCERT Pg. No. 101
The squamous epithelium is made of a single thin layer of flattened cells with irregular boundaries.
They are found in the walls of blood vessels and air sacs of lungs and are involved in functions like forming a diffusion boundary. The cuboidal epithelium is composed of a single layer of cube-like cells. This is commonly found in ducts of glands and tubular parts of nephrons in kidneys and its main functions are secretion and absorption. The epithelium of proximal convoluted tubule (PCT) of nephron in the kidney has microvilli. The columnar epithelium is composed of a single layer of tall and slender cells. Their nuclei are located at the base. Free surface may have microvilli. They are found in the lining of stomach and intestine and help in secretion and absorption.

Q.133 (4)
Old NCERT Pg. No. 102



Compound epithelium
Their main function is to provide protection against chemical and mechanical stresses. They cover the dry surface of the skin, the moist surface of buccal cavity, pharynx, inner lining of ducts of salivary glands and of pancreatic ducts.

Q.134 (1)
Old NCERT Pg. No. 104
Bones have a hard and non-pliable ground substance rich in calcium salts and collagen fibres which give bone its strength.

Q.135 (4)
Old NCERT Pg. No. 103, 104
Cartilage, bones and blood are various types of specialised connective tissues.

Q.136 (1)
Syngenesious stamens means when anthers are fused but filaments are free e.g. → Asteraceae

Q.137 (3)
New NCERT Pg. No. 66
The hilum is a scar on the seed coat through which the developing seeds were attached to the fruit.

Q.138 (2)
Gramineae/Poaceae is the largest family in angiosperms. It is the grass family.

Q.139 (4)
The inflorescence in gramineae family is spike of spikelet in which glumes, lodicales, superior and inferior pales are present.

Q.140 (2)
Old NCERT Pg. No. 67
The stems of maize and sugarcane have supporting roots coming out of the lower nodes of the stem. These are called stilt roots.
The hanging structures that support a banyan tree are called prop roots.

Q.141 (3)
New NCERT Pg. No. 77
In grasses, certain adaxial epidermal cells along the veins modify themselves into large, empty, colourless cells. These are called bulliform cells. When the bulliform cells in the leaves have absorbed water and are turgid, the leaf surface is exposed. When they are flaccid due to water stress, they make the leaves curl inwards to minimise water loss.

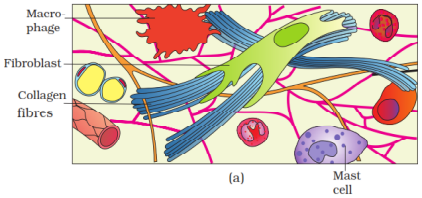
Q.142 (3)
Old NCERT Pg. No. 85
The meristem that occurs in the mature regions of roots and shoots of many plants, particularly those that produce woody axis and appear later than primary meristem is called the secondary or lateral meristem. They are cylindrical meristems. Fascicular vascular cambium, interfascicular cambium and cork-cambium are examples of lateral meristems.

Q.143 (4)
Old NCERT Pg. No. 85
The meristem which occurs between mature tissues is known as intercalary meristem. They occur in grasses and regenerate parts removed by the grazing herbivores.

Q.144 (4)
Old NCERT Pg. No. 88
The companion cells are specialised parenchymatous cells, which are closely associated with sieve tube elements. Gymnosperms have albuminous cells and sieve cells. They lack sieve tubes and companion cells.

Q.145 (3)
Old NCERT Pg. No. 87
The presence of vessels is a characteristic feature of angiosperms.

Q.146 (3)
Old NCERT Pg. No. 103



Loose connective tissue : (a) Areolar tissue

Q.147 (1)
Old NCERT Pg. No. 113
Heart of cockroach consists of elongated muscular tube lying along mid dorsal line of thorax and abdomen. It is differentiated into funnel shaped chambers with ostia on either side.

Q.148 (2)
Old NCERT Pg. No. 101
The cuboidal epithelium is composed of a single layer of cube-like cells. This is commonly found in ducts of glands and tubular parts of nephrons in kidneys and its main functions are secretion and absorption. The epithelium of proximal convoluted tubule (PCT) of nephron in the kidney has microvilli. The columnar epithelium is composed of a single layer of tall and slender cells. Their nuclei are located at the base. Free surface may have microvilli.

Q.149 (3)
Old NCERT Pg. No. 103
Loose connective tissue has cells and fibres loosely arranged in a semi-fluid ground substance, for example, areolar tissue present beneath the skin

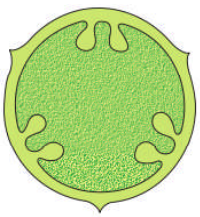
Q.150 (1)
Old NCERT Pg. No. 104, 105
The intercellular material of cartilage is solid and pliable and resists compression. The smooth muscle fibres taper at both ends (fusiform) and do not show striations.

Q.151 (2)
New NCERT Pg. No. 61
When a shoot tip transforms into a flower, it is always solitary. In cymose type of inflorescence the main axis terminates in a flower, hence is limited in growth.The flowers are borne in a basipetal order.

Q.152 (3)
New NCERT Pg. No. 59
The stem is the ascending part of the axis bearing branches, leaves, flowers and fruits. It develops from the plumule of the embryo of a germinating seed.

Q.153 (1)
New NCERT Pg. No. 64
If the margins of sepals or petals overlap one another but not in any particular direction as in *Cassia* and gulmohur, the aestivation is called imbricate.

Q.154 (1)
New NCERT Pg. No. 65



In parietal placentation, the ovules develop on the inner wall of the ovary or on peripheral part. Ovary is one-chambered but it becomes twochambered due to the formation of the false septum, e.g., mustard and Argemone.

Q.155 (1)
New NCERT Pg. No. 65
In parietal placentation, the ovules develop on the inner wall of the ovary or on peripheral part.
Ovary is one-chambered but it becomes twochambered due to the formation of the false septum, e.g., mustard and Argemone.

Q.156 (2)
Old NCERT Pg. No. 67
The stems of maize and sugarcane have supporting roots coming out of the lower nodes of the stem. These are called stilt roots.

Q.157 (3)
New NCERT Pg. No. 66, 67
In some seeds such as castor the endosperm formed as a result of double fertilisation, is a food storing tissue and called endospermic seeds. In plants such as bean, gram and pea, the endosperm is not present in mature seeds and such seeds are called non-endospermous.
Generally, monocotyledonous seeds are endospermic but some as in orchids are non-endospermic.
The plumule and radicle are enclosed in sheaths which are called coleoptile and coleorhiza respectively

Q.158 (2)
New NCERT Pg. No. 66
Endosperm develpment occurs before embryo development as it provides nourishment to the developing embryo.
Within the seed coat is the embryo, consisting of an embryonal axis and two cotyledons.

Q.159 (4)
New NCERT Pg. No. 64
There may be a variation in the length of filaments within a flower, as in *Salvia* and mustard.

Q.160 (2)
New NCERT Pg. No. 59
The root is covered at the apex by a thimble-like structure called the root cap. It protects the tender apex of the root as it makes its way through the soil. A few millimetres above the root cap is the region of meristematic activity. The cells of this region are very small, thin-walled and with dense protoplasm. They divide repeatedly. The cells proximal to this region undergo rapid elongation and enlargement and are responsible for the growth of the root in length. This region is called the region of elongation. The cells of the elongation zone gradually differentiate and mature. Hence, this zone, proximal to region of elongation, is called the region of maturation. From this region some of the epidermal cells form very fine and delicate, thread-like structures called root hairs. These root hairs absorb water and minerals from the soil.

Q.161 (1)
New NCERT Pg. No. 65
In mango and coconut, the fruit is known as a drupe. They develop from monocarpellary superior ovaries and are one seeded.

Q.162 (4)
Old NCERT Pg. No. 68
Underground stems of potato, ginger, turmeric, *zaminkand*, *Colocasia* are modified to store food in them.
Thorns are found in many plants such as *Citrus*, *Bougainvillea*.
Some plants of arid regions modify their stems into flattened (*Opuntia*), or fleshy cylindrical (*Euphorbia*) structures.
Stem tendrils which develop from axillary buds, are slender and spirally coiled and help plants to climb such as in gourds (cucumber, pumpkins, watermelon) and grapevines.

Q.163 (2)
Old NCERT Pg. No. 68
Stem tendrils which develop from axillary buds, are slender and spirally coiled and help plants to climb such as in gourds (cucumber, pumpkins, watermelon) and grapevines.
Axillary buds of stems may also get modified into woody, straight and pointed thorns. Thorns are found in many plants such as *Citrus*, *Bougainvillea*. They protect plants from browsing animals.

Q.164 (4)
New NCERT Pg. No. 60
A bud is present in the axil of petiole in both simple and compound leaves, but not in the axil of leaflets of the compound leaf.

Q.165 (1)
New NCERT Pg. No. 62
When a flower can be divided into two equal radial halves in any radial plane passing through the centre, it is said to be actinomorphic, e.g., mustard, *datura*, chilli.

Q.166 (1)
New NCERT Pg. No. 74

• In dicot root, parenchymatous cells which lie between xylem and phloem are called conjuctive tissue.
• In exarch condition, protoxylem lies towards periphery and metaxylem lies towards the centre.

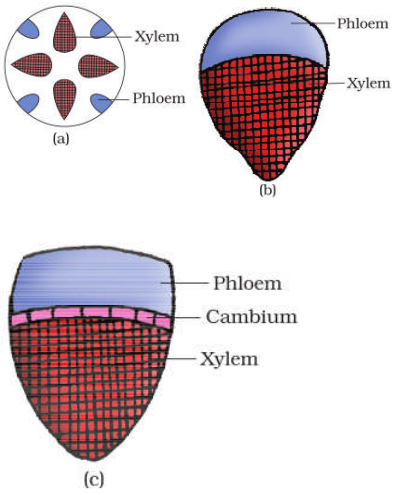
Q.167 (1)
New NCERT Pg. No. 76

The monocot stem has a sclerenchymatous hypodermis, a large number of scattered vascular bundles, each surrounded by a sclerenchymatous bundle sheath, and a large, conspicuous parenchymatous ground tissue.

Q.168 (1)
New NCERT Pg. No. 75

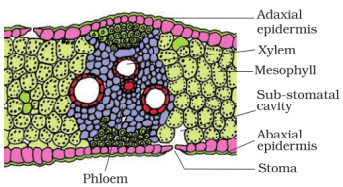
The innermost layer of the cortex is called the endodermis. The cells of the endodermis are rich in starch grains and the layer is also referred to as the starch sheath.

Q.169 (3)
New NCERT Pg. No. 73



Various types of vascular bundles :
(a) radial (b) conjoint closed (c) conjoint open
In dicotyledonous stems, cambium is present between phloem and xylem and hence are called open vascular bundles. In conjoint type of vascular bundles, the xylem and phloem are jointly situated along the same radius of vascular bundles.

Q.170 (2)
New NCERT Pg. No. 76



Q.171 (3)
New NCERT Pg. No. 72

All tissues except epidermis and vascular bundles constitute the ground tissue. It consists of simple tissues such as parenchyma, collenchyma and sclerenchyma. Parenchymatous cells are usually present in cortex, pericycle, pith and medullary rays, in the primary stems and roots.

Q.172 (3)
New NCERT Pg. No. 71

The epidermal tissue system forms the outer-most covering of the whole plant body and comprises epidermal cells, stomata and the epidermal appendages – the trichomes and hairs.

Q.173 (2)
New NCERT Page 76

Pericycle is present on the inner side of the endodermis and above the phloem in the form of semi-lunar patches of sclerenchyma in dicot stem.

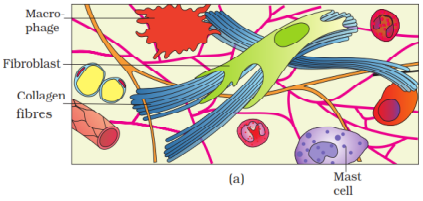
Q.174 (4)
Old NCERT Pg. No. 104

Most of the cartilages in vertebrate embryos are replaced by bones in adults.

Q.175 (1)
Old NCERT Pg. No. 101

Ciliated epithelium function is to move particles or mucus in a specific direction over the epithelium. They are mainly present in the inner surface of hollow organs like bronchioles and fallopian tubes.

Q.176 (2)
Old NCERT Pg. No. 103



Fibroblasts (cells that produce and secrete fibres).

Q.177 (2)
Old NCERT Pg. No. 103

Areolar tissue present beneath the skin. Often it serves as a support framework for epithelium. It contains fibroblasts (cells that produce and secrete fibres), macrophages and mast cells. Adipose tissue is another type of loose connective tissue located mainly beneath the skin. The cells of this tissue are specialised to store fats.

Tendons, which attach skeletal muscles to bones and ligaments which attach one bone to another are examples of this tissue.

Q.178 (2)
New NCERT Pg. No. 82
Digested food is absorbed by the numerous finger-like folds in the inner wall of intestine called villi and microvilli.

Q.179 (4)
Old NCERT Pg. No. 103, 104
In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres. Tendons, which attach skeletal muscles to bones and ligaments which attach one bone to another are examples of this tissue. Dense irregular connective tissue has fibroblasts and many fibres (mostly collagen) that are oriented differently. This tissue is present in the skin. Cartilage, bones and blood are various types of specialised connective tissues.

Q.180 (2)
Old NCERT Pg. No. 114
The sperms are stored in the seminal vesicles and are glued together in the form of bundles called spermatophores which are discharged during copulation.

Q.181 (3)
New NCERT Pg. No. 82
Heart is a muscular structure situated in the upper part of the body cavity.
It has three chambers, two atria and one ventricle and is covered by a membrane called pericardium.

Q.182 (3)
Old NCERT Pg. No. 112
In males, genital pouch or chamber lies at the hind end of abdomen bounded dorsally by 9^{th} and 10^{th} terga and ventrally by the 9^{th} sternum. It contains dorsal anus, ventral male genital pore and gonapophysis.

Q.183 (2)
Old NCERT Pg. No. 112, 113
A median flexible lobe, acting as tongue (hypopharynx), lies within the cavity enclosed by the mouthparts.
This in turn opens into a sac like structure called crop used for storing of food. The crop is followed by gizzard or proventriculus. It has an outer layer of thick circular muscles and thick inner cuticle forming six highly chitinous plate called teeth. Gizzard helps in grinding the food particles. The entire foregut is lined by cuticle. A ring of 6-8 blind tubules called hepatic or gastric caeca is present at the junction of foregut and midgut, which secrete digestive juice.

Q.184 (2)
New NCERT Pg. No. 81
Male frogs can be distinguished by the presence of sound producing vocal sacs and also a copulatory pad on the first digit of the fore limbs which are absent in female frogs.

Q.185 **(3)**
New NCERT Pg. No. 82
The blood from the heart is carried to all parts of the body by the arteries (arterial system).
The veins collect blood from different parts of body to the heart and form the venous system. Special venous connection between liver and intestine as well as the kidney and lower parts of the body are present in frogs. The former is called hepatic portal system and the latter is called renal portal system.

Q.186 (4)
New NCERT Pg. No. 66
In plants such as bean, gram and pea, the endosperm is not present in mature seeds and such seeds are called non-endospermous.

Q.187 (4)
Old NCERT Pg. No. 71
In opposite type, a pair of leaves arise at each node and lie opposite to each other as in *Calotropis* and guava plants. Leaf spines for defence as in cacti. Leaf tendrils for climbing as in peas. The fleshy leaves of onion and garlic store food.

Q.188 (2)
Abelmoschus esculentus is okra i.e., Bhindi and it belngs to malvaceae family.

Q.189 (1)
Tetradynamous stamens means 2 short and 4 long stamens. e.g., Cruciferae

Q.190 (1)
Old NCERT Pg. No. 67
The stems of maize and sugarcane have supporting roots coming out of the lower nodes of the stem. These are called stilt roots.

Q.191 (3)
New NCERT Pg. No. 76

Q.192 (4)
New NCERT Pg. No. 75
Epidermis, collenchyma, parenchyma, endodermis, pericycle, phloem, cambium, metaxylem, protoxylem and pith.

Q.193 (1)
New NCERT Pg. No. 72

The root hairs are unicellular elongations of the epidermal cells and help absorb water and minerals from the soil. On the stem the epidermal hairs are called trichomes. The trichomes in the shoot system are usually multicellular. They may be branched or unbranched and soft or stiff. They may even be secretory. The trichomes help in preventing water loss due to transpiration.

Q.194 (4)
Old NCERT Pg. No. 86, 92

The cells of the parenchyma are generally isodiametric. They may be spherical, oval, round, polygonal or elongated in shape. The outer hypodermis, consists of a few layers of collenchymatous cells just below the epidermis, which provide mechanical strength to the young stem.

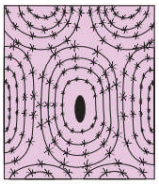
Q.195 (4)
Old NCERT Page 87/88

Phloem in angiosperms is composed of sieve tube elements, companion cells, phloem parenchyma and phloem fibres.

Q.196 (2)
Old NCERT Pg. No. 102

Their main function is to provide protection against chemical and mechanical stresses. They cover the dry surface of the skin, the moist surface of buccal cavity, pharynx, inner lining of ducts of salivary glands and of pancreatic ducts.

Q.197 (3)
Old NCERT Pg. No. 104



Specialised connective tissues : Bone

Q.198 (2)
Old NCERT Pg. No. 103

In the dense regular connective tissues, the collagen fibres are present in rows between many parallel bundles of fibres. Tendons, which attach skeletal muscles to bones and ligaments which attach one bone to another are examples of this tissue.

Q.199 (2)
Old NCERT Pg. No. 101

An epithelial tissue as epithelium (pl.: epithelia). This tissue has a free surface, which faces either a body fluid or the outside environment and thus provides a covering or a lining for some part of the body. The cells are compactly packed with little intercellular matrix.

Q.200 (3)
Old NCERT Pg. No. 101

The squamous epithelium is made of a single thin layer of flattened cells with irregular boundaries. They are found in the walls of blood vessels and air sacs of lungs and are involved in functions like forming a diffusion boundary.