CAREER POINT

AIPMT (NEET-Phase 2)2016

(Paper & Solution)

Code – WW Date : 24-07-2016

Q.1 Planck's constant (h), speed of light in vacuum (c) and Newton's gravitational constant (G) are three fundamental constants. Which of the following combinations of these has the dimension of length ?

(1) $\frac{\sqrt{hG}}{c^{3/2}}$ (2) $\frac{\sqrt{hG}}{c^{5/2}}$ (3) $\sqrt{\frac{hc}{G}}$ (4) $\sqrt{\frac{Gc}{h^{3/2}}}$

Students may find similar question in CP exercise sheet :
[Chapter : Unit & dimension, Exercise # 1(B), Page No.19, Q.22]

Ans. **[1]**

Sol. $L \propto h^x c^y G^z$

$[M^0L^1T^0] = [ML^2T^{-1}]^x [LT^{-1}]^y [M^{-1}L^3T^{-2}]^z$

$= M^{x-z} L^{2x+y+3z} T^{-x-y-2z}$

$$\left.\begin{aligned} x - z = 0 \Rightarrow x = z \\ 2x + y + 3z = 1 \\ -x - y - 2z = 0 \end{aligned}\right\} \quad \begin{aligned} x = z = 1/2 \\ y = -3/2 \end{aligned}$$

Q.2 Two cars P and Q start from a point at the same time in a straight line and their positions are represented by $x_P(t) = at + bt^2$ and $x_Q(t) = ft - t^2$. At what time do the cars have the same velocity ?

(1) $\frac{a-f}{1+b}$ (2) $\frac{a+f}{2(b-1)}$ (3) $\frac{a+f}{2(1+b)}$ (4) $\frac{f-a}{2(1+b)}$

Students may find similar question in CP Class notes :
[Chapter : Motion in one dimension]

Ans. **[4]**

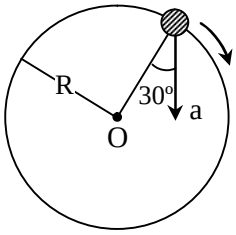
Sol. $v_P = \frac{dx_P}{dt} = a + 2bt$

$v_Q = \frac{dx_Q}{dt} = f - 2t$

$v_P = v_Q \Rightarrow a + 2bt = f - 2t$

$t = \frac{f-a}{2(b+1)}$

Q.3 In the given figure, a = 15 m/s^2 represents the total acceleration of a particle moving in the clockwise direction in a circle of radius R = 2.5 m at a given instant of time. The speed of the particle is –



(1) 4.5 m/s (2) 5.0 m/s (3) 5.7 m/s (4) 6.2 m/s

Students may find similar question in CP Class notes :
[*Chapter : Circular motion*]

Ans. **[3]**

Sol. $\text{Tan}\,\theta = \dfrac{dV/dt}{V^2/R}$

$\text{Tan}\,30^\circ = \dfrac{1}{\sqrt{3}} = \dfrac{dV/dt}{V^2/R}$

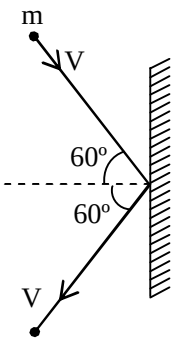
$\dfrac{dV}{dt} = \dfrac{1}{\sqrt{3}} \times \dfrac{V^2}{R}$

$a = 15 = \sqrt{\left(\dfrac{dV}{dt}\right)^2 + \left(\dfrac{V^2}{R}\right)^2}$

$15 = \sqrt{\dfrac{4}{3}\left(\dfrac{V^2}{R}\right)^2}$

$15 = \dfrac{2}{\sqrt{3}}\left(\dfrac{V^2}{R}\right) = \dfrac{2}{\sqrt{3}} \times \dfrac{V^2}{2.5} \Rightarrow V^2 = \dfrac{15 \times \sqrt{3} \times 2.5}{2} = 32.476 = 5.7 \text{ m/s}$

Q.4 A rigid ball of mass m strikes a rigid wall at 60º and gets reflected without loss of speed as shown in the figure below. The value of impulse imparted by the wall on the ball will be –



(1) mV (2) 2 mV (3) $\frac{mV}{2}$ (4) $\frac{mV}{3}$

Students may find similar question in CP exercise sheet :
[Chapter : Laws of motion, Exercise # 3(A), Page No. 50, Q.11]

Ans. **[1]**

Sol. Impulse = $\overrightarrow{\Delta P}$

= 2 mv cos 60º = mv

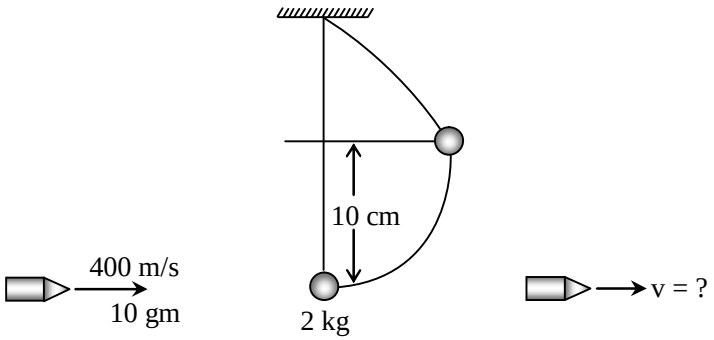
Q.5 A bullet of mass 10 g moving horizontally with a velocity of 400 ms^{-1} strikes a wooden block of mass 2 kg which is suspended by a light inextensible string of length 5 m. As a result, the centre of gravity of the block is found to rise a vertical distance of 10 cm. The speed of the bullet after it emerges out horizontally from the block will be -

(1) 100 ms^{-1} (2) 80 ms^{-1} (3) 120 ms^{-1} (4) 160 ms^{-1}

Students may find similar question in CP exercise sheet :
[Chapter : W.P.E., Example # 9, Page No.75]

Ans. **[3]**

Sol.



Velocity of block = $\sqrt{2gh}$ = $\sqrt{2\times g\times 0.1}$ = $\sqrt{2}$ m/s

$P_i = P_f$

$(10 \times 10^{-3}) \times 400 + 0 = 2 \times \sqrt{2} + (10 \times 10^{-3})\ V$

$V = \frac{(4-2\sqrt{2})}{10\times 10^{-3}}$ = 120 m/s

Q.6 Two identical balls A and B having velocities of 0.5 m/s and – 0.3 m/s respectively collide elastically in one dimension. The velocities of B and A after the collision respectively will be -

(1) – 0.5 m/s and 0.3 m/s (2) 0.5 m/s and – 0.3 m/s

(3) – 0.3 m/s and 0.5 m/s (4) 0.3 m/s and 0.5 m/s

Students may find similar question in CP exercise sheet :
[Chapter : W.P.E., Exercise # 1, Page No.92, Q.54]

Ans. **[2]**

Sol. Velocity will interchange

So $v_B = 0.5$, $v_A = -0.3$

Q.7 A particle moves from a point $(-2\hat{i}+5\hat{j})$ to $(4\hat{j}+3\hat{k})$ when a force of $(4\hat{i}+3\hat{j})$ N is applied. How much work has been done by the force ?

(1) 8 J (2) 11 J (3) 5 J (4) 2 J

Students may find similar question in CP exercise sheet :
[Chapter : W.P.E, Exercise # 1, Page No.88, Q.4]

Ans. **[3]**

Sol. $W = \vec{F} \cdot \overrightarrow{dS}$

$= (4\hat{i}+3\hat{j}) \cdot [(4\hat{j}+3\hat{k}) - (-2\hat{i}+5\hat{j})]$

$= (4\hat{i}+3\hat{j}) \cdot (2\hat{i}-\hat{j}+3\hat{k})$

$= 8 - 3 = 5$ J

Q.8 Two rotating bodies A and B of masses m and 2m with momenta of inertia I_A and I_B ($I_B > I_A$) have equal kinetic energy of rotation. If L_A and L_B be their angular momenta respectively, then -

(1) $L_A = \frac{L_B}{2}$ (2) $L_A = 2L_B$ (3) $L_B > L_A$ (4) $L_A > L_B$

Students may find similar question in CP Class notes :
[Chapter : Rotational motion]

Ans. **[3]**

Sol. $K.E_A = K.E_B$

$\frac{1}{2}I_A\omega_A^2 = \frac{1}{2}I_B\omega_B^2$]

$\frac{\omega_A}{\omega_B} = \sqrt{\frac{I_B}{I_A}}$ ….(i) $\{I_B > I_A \Rightarrow \frac{I_A}{I_B} < 1\}$

$L_A = I_A\omega_A$ $L_B = I_B\omega_B$

$\frac{L_A}{L_B} = \frac{I_A}{I_B} \times \frac{\omega_A}{\omega_B} = \frac{I_A}{I_B} \times \sqrt{\frac{I_A}{I_B}}$

$= \sqrt{\frac{I_A}{I_B}} < 1$

$[L_A < L_B]$

Q.9 A solid sphere of mass m and radius R is rotating about its diameter. A solid cylinder of the same mass and same radius is also rotating about its geometrical axis with an angular speed twice that of the sphere. The ratio of their kinetic energies of rotation (E_{sphere} / $E_{cylinder}$) will be -

(1) 2 : 3 (2) 1 : 5 (3) 1 : 4 (4) 3 : 1

Students may find similar question in CP exercise sheet :
[Chapter : Rotational motion, Exercise # 2, Page No.154, Q.44]

Ans. **[2]**

Sol. $K.E = \frac{1}{2} I\omega^2$

$$\frac{K.E_{sphere}}{K.E_{cylinder}} = \frac{I_{sphere}}{I_{cylinder}} \left(\frac{\omega_{sphere}}{\omega_{cylinder}}\right)^2$$

$$= \frac{\frac{2}{5}MR^2}{\frac{MR^2}{2}} \left(\frac{\omega}{2\omega}\right)^2$$

$$= \frac{4}{5} \times \frac{1}{4} = 1 : 5$$

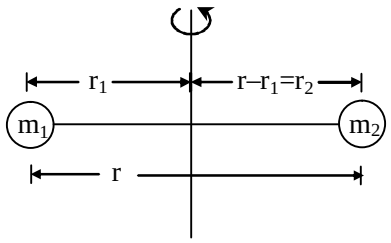
Q.10 A light rod of length l has two masses m_1 and m_2 attached to its two ends. The moment of inertia of the system about an axis perpendicular to the rod and passing through the centre of mass is -

(1) $\frac{m_1 m_2}{m_1 + m_2} l^2$ (2) $\frac{m_1 + m_2}{m_1 m_2} l^2$ (3) $(m_1 + m_2) l^2$ (4) $\sqrt{m_1 m_2}\, l^2$

Students may find similar question in CP exercise sheet :
[Chapter : Rotational motion, Exercise #1, Page No.141, Q.22]

Ans. **[1]**

Sol.



$m_1 r_1 = m_2 (l - r_2)$

$(m_1 + m_2) r_1 = m_2 r$

$$r_1 = \frac{m_2 l}{m_1 + m_2}$$

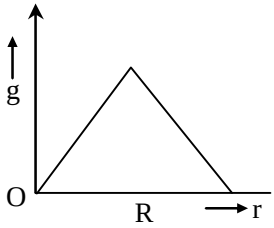
and $$r_2 = r - r_1 = r - \frac{m_2 l}{m_1 + m_2} = \frac{m_1 l}{m_1 + m_2}$$

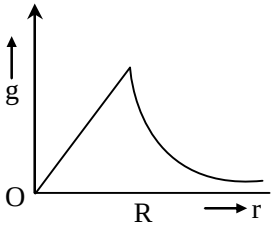
So $I = I_1 + I_2$

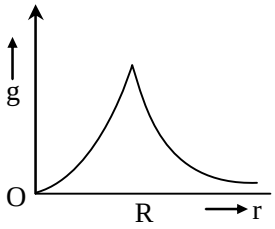
$= m_1 r_1^2 + m_2 r_2^2$

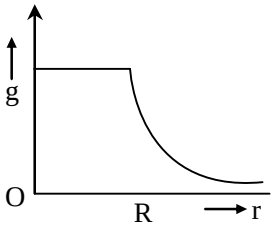
$$= m_1 \left(\frac{m_2 l}{m_1 + m_2}\right)^2 + m_2 \left(\frac{m_1 l}{m_1 + m_2}\right)^2 = \frac{m_1 m_2 l^2}{m_1 + m_2}$$

Q.11 Starting from the centre of the earth having radius R, the variation of g (acceleration due to gravity) is shown by -

(1) 

(2) 

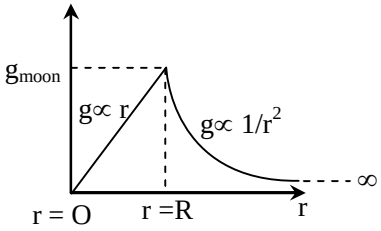
(3) 

(4) 

Students may find similar question in CP exercise sheet :
[Chapter : Gravitation, Exercise # 3(A), Page No.215, Q.42]

Ans. **[2]**

Sol.



$$g_{in\ side} = \left(\frac{GM}{R^3}\right) r$$

$$g_{surface} = \frac{GM}{R^2}$$

$$g_{out\ side} = \frac{GM}{r^2}$$

Q.12 A satellite of mass m is orbiting the earth (of radius R) at a height h from its surface. The total energy of the satellite in terms of g_0, the value of acceleration due to gravity at the earth's surface, is -

(1) $\frac{mg_0R^2}{2(R+h)}$ (2) $-\frac{mg_0R^2}{2(R+h)}$ (3) $\frac{2mg_0R^2}{R+h}$ (4) $-\frac{2mg_0R^2}{R+h}$

Students may find similar question in CP exercise sheet :
[Chapter : Gravitation, Theory, Page No.203]

Ans. **[2]**

Sol. $T.E = -\frac{GMm}{2r}$

$$\therefore\ g_0 = g_{surface} = \frac{GM}{R^2}$$

$$GM = g_0R^2$$

$$T.E = -\frac{g_0R^2m}{2(R+h)}$$

Q.13 A rectangular film of liquid is extended from (4 cm × 2 cm) to (5 cm × 4 cm). If the work done is 3×10^{-4} J, the value of the surface tension of the liquid is -

(1) 0.250 Nm^{-1} (2) 0.125 Nm^{-1} (3) 0.2 Nm^{-1} (4) 8.0 Nm^{-1}

Students may find similar question in CP exercise sheet :
[Chapter : Surface tension, Exercise # 3(B), Page No.199, Q.52]

Ans. **[2]**

Sol. $W = 2(T\Delta A)$

$\Delta A = A_2 - A_1$

$= (20 - 8) \times 10^{-4}\ m^2$

$= 12 \times 10^{-4}\ m^2$

$T = \frac{W}{2\Delta A} = \frac{3\times10^{-4}}{2\times12\times10^{-4}}$

$T = \frac{1}{8}$ N/m = 0.125 N/m

Q.14 Three liquids of densities having the same value of surface tension T, rise to the same height in three identical capillaries. The angles of contact θ_1, θ_2 and θ_3 obey-

(1) $\frac{\pi}{2} > \theta_1 > \theta_2 > \theta_3 \geq 0$ (2) $0 \leq \theta_1 < \theta_2 < \theta_3 < \frac{\pi}{2}$

(3) $\frac{\pi}{2} < \theta_1 < \theta_2 < \theta_3 < \pi$ (4) $\pi > \theta_1 > \theta_2 > \theta_3 > \frac{\pi}{2}$

Students may find similar question in CP Class notes:
[Chapter : Surface tension]

Ans. **[2]**

Sol. $h = \frac{2T\cos\theta_c}{r\rho g}$ = same

$\cos\theta_c \propto \rho$

$\rho_1 > \rho_2 > \rho_3$

$\cos\theta_{c_1} > \cos\theta_{c_2} > \cos\theta_{c_3}$

$0 \leq \theta_{c_1} < \theta_{c_2} < \theta_{c_3} < \frac{\pi}{2}$

Q.15 Two identical bodies are made of a material for which the heat capacity increases with temperature. One of these is at 100ºC, while the other one is at 0ºC. If the two bodies are brought into contact, then, assuming no heat loss, the final common temperature is -

(1) 50ºC (2) more than 50ºC

(3) less than 50ºC but greater than 0ºC (4) 0ºC

Students may find same question in CP exercise sheet :
[Chapter : Calorimetry, Exercise # 1, Page No.101, Q.32]

Ans. **[2]**

Sol. Due to temperature heat capacity increase so heat capacity of second will greater than first. Let heat capacity are c_1 & c_2 and common temperature T so

$mc_1 (T - 0) = mc_2(100 - T)$

$$\frac{T}{100-T} = \frac{c_2}{c_1} > 1 \qquad \{c_2 > c_1\}$$

$T > 50$

Q.16 A body cools from a temperature3T to 2T in 10 minutes. The room temperature is T. Assume that Newton's law of cooling is applicable. The temperature of the body at the end of next 10 minutes will be -

(1) $\frac{7}{4}$ T (2) $\frac{3}{2}$T (3) $\frac{4}{3}$T (4) T

Students may find same question in CP exercise sheet :
[Chapter : Radiation, Exercise # 1, Page No.213, Q.77]

Ans. **[2]**

Sol. $3T \xrightarrow{t_1=10 \text{ min}} 2T \xrightarrow{t_2=10 \text{ min}} Tf$

$T_0 = T$

$$\left(\frac{3T-2T}{10}\right) = c_1\left(\frac{3T+2T}{2} - T\right) \qquad \text{....(i)}$$

$$\left(\frac{2T-T_f}{10}\right) = c_1\left(\frac{2T+T_f}{2} - T\right) \qquad \text{....(ii)}$$

$$\frac{\text{Eq.(i)}}{\text{Eq.(ii)}} \Rightarrow \frac{T/10}{\frac{2T-T_f}{10}} = \frac{\frac{5T-2T}{2}}{\frac{T_f}{2}}$$

$$\frac{T}{2T-T_f} = \frac{3T}{T_f}$$

$T_f = 6T - 3T_f$

$4T_f = 6T$

$T_f = \frac{3}{2}T$

Q.17 One mole of an ideal monatomic gas undergoes a process described by the equation PV^3 = constant. The heat capacity of the gas during this process is -

(1) $\frac{3}{2}$R (2) $\frac{5}{2}$R (3) 2 R (4) R

Students may find similar question in CP Class notes & DPPS :
[Chapter : Calorimetry]

Ans. **[4]**

Sol. $PV^3 = C\ (n = 3)$

Specific heat in polytropic process

$PV^n = K$

$$C = C_V + \frac{R}{1-n}$$

$$= \frac{3}{2}R + \frac{R}{1-3}$$

$$= \frac{3}{2}R - \frac{R}{2} = R$$

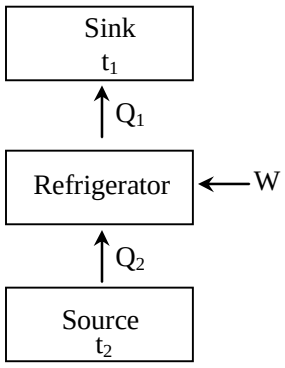
Q.18 The temperature inside a refrigerator is t_2°C and the room temperature is t_1°C. The amount of heat delivered to the room for each joule of electrical energy consumed ideally will be

(1) $\frac{t_1}{t_1 - t_2}$ (2) $\frac{t_1 + 273}{t_1 - t_2}$ (3) $\frac{t_2 + 273}{t_1 - t_2}$ (4) $\frac{t_1 + t_2}{t_1 + 273}$

Students may find similar question in CP Class notes :
[Chapter : Thermodynamics]

Ans. **[2]**

Sol.



$$\frac{Q_1}{W} = \frac{Q_1}{Q_1 - Q_2} = \frac{t_1 + 273}{t_1 - t_2}$$

Q.19 A given sample of an ideal gas occupies a volume V at a pressure P and absolute temperature T. The mass of each molecule of the gas is m. Which of the following gives the density of the gas ?

(1) P/(kT) (2) Pm/(kT) (3) P/(kTV) (4) mkT

Students may find similar question in CP exercise sheet :
[Chapter : KTG, Theory, Page No 115]

Ans. **[2]**

Sol. $PV = nRT$

$$\frac{n}{V} = \frac{P}{RT}$$

$$\frac{n}{V} = \frac{P}{kN_AT} \qquad \left(k = \frac{R}{N_A}\right)$$

$$\frac{nN_A}{V} = \frac{P}{kT}$$

$$\frac{mnN_A}{V} = \frac{mP}{kT}$$

$$\rho = \frac{mP}{kT}$$

Q.20 A body of mass m is attached to the lower end of a spring whose upper end is fixed. The spring has negligible mass when the mass m is slightly pulled down and released, it oscillates with a time period of 3 s. When the mass m is increased by 1 kg, the time period of oscillations becomes 5 s. The value of m in kg is

(1) $\frac{3}{4}$ (2) $\frac{4}{3}$ (3) $\frac{16}{9}$ (4) $\frac{9}{16}$

Students may find similar question in CP exercise sheet :
[Chapter : SHM, Exercise # 2, Page No.246, Q.12]

Ans. **[4]**

Sol. $3 = 2\pi\sqrt{\frac{m}{k}}$

$$5 = 2\pi\sqrt{\frac{m+1}{k}}$$

$$\frac{3}{5} = \sqrt{\frac{m}{m+1}}$$

$$\frac{9}{25} = \frac{m}{m+1}$$

$9m + 9 = 25\ m$

$16\ m = 9$

$$m = \frac{9}{16}$$

Q.21 The second overtone of an open organ pipe has the same frequency as the first overtone of a closed pipe L metre long. The length of the open pipe will be

(1) L (2) 2L (3) $\frac{L}{2}$ (4) 4L

Students may find similar question in CP exercise sheet :
[Chapter : Wave theory, Exercise # 2, Page No.51, Q.39]

Ans. **[2]**

Sol. $$\frac{3v}{2\ell_0} = \frac{3v}{4L}$$

$2\ell_0 = 4L$

$\ell_0 = 2L$

Q.22 Three sound waves of equal amplitudes have frequencies (n – 1), n, (n + 1). They superimpose to give beats. The number of beats produced per second will be

(1) 1 (2) 4 (3) 3 (4) 2

Students may find similar question in CP exercise sheet :
[Chapter : Wave theory, Exercise # 4, Page No.63, Q.7]

Ans. **[4]**

Sol. Maximum difference of frequency

= (n + 1) – (n – 1) = 2

Q.23 An electric dipole is placed at an angle of 30° with an electric field intensity 2×10^5 N/C. It experiences a torque equal to 4 Nm. The charge on the dipole, if the dipole length is 2 cm, is

(1) 8 mC (2) 2 mC (3) 5 mC (4) 7 μC

Students may find similar question in CP exercise sheet :
[Chapter : Electrostatics, Exercise # 1, Page No.41, Q.89]

Ans. **[2]**

Sol. $\tau = pE\sin\theta$

$\tau = q\ell E\sin\theta$

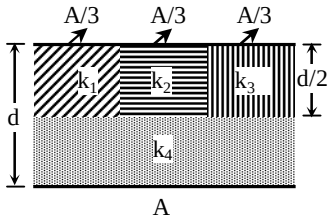
$$q = \frac{\tau}{\ell E\sin\theta}$$

$$q = \frac{4}{2\times10^{-2}\times2\times10^{5}\times\frac{1}{2}}$$

$q = 2\times10^{-3}\,C$

$q = 2mC$

Q.24 A parallel-plate capacitor of area A, plate separation d and capacitance C is filled with four dielectric materials having dielectric constants k_1, k_2, k_3 and k_4 as shown in the figure below. If a single dielectric material is to be used to have the same capacitance C in this capacitor, then its dielectric constant k is given by



(1) $k = k_1 + k_2 + k_3 + 3k_4$

(2) $k = \frac{2}{3}(k_1 + k_2 + k_3) + 2k_4$

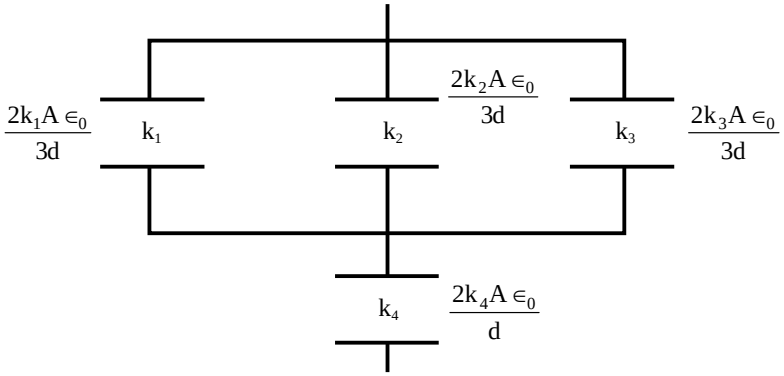
(3) $\frac{2}{k} = \frac{3}{k_1 + k_2 + k_3} + \frac{1}{k_4}$

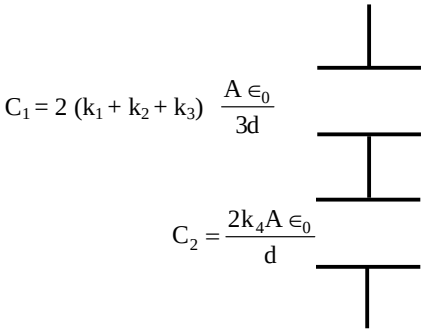
(4) $\frac{1}{k} = \frac{1}{k_1} + \frac{1}{k_2} + \frac{1}{k_3} + \frac{3}{2k_4}$

Students may find similar question in CP Class notes :
[Chapter : Capacitance]

Ans. **[3]**

Sol.





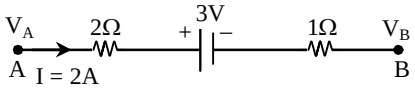
$$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2}$$

$$\frac{d}{kA\epsilon_0} = \frac{3d}{2(k_1+k_2+k_3)A\epsilon_0} + \frac{d}{2k_4A\epsilon_0}$$

$$\frac{d}{kA\epsilon_0} = \frac{d}{A\epsilon_0}\left[\frac{3}{2(k_1+k_2+k_3)} + \frac{1}{2k_4}\right]$$

$$\frac{2}{k} = \frac{3}{k_1+k_2+k_3} + \frac{1}{k_4}$$

Q.25 The potential difference $(V_A - V_B)$ between the points A and B in the given figure is

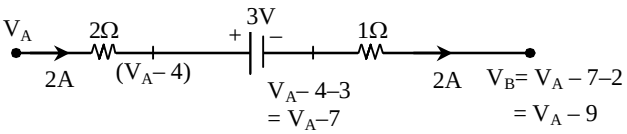


(1) –3 V (2) +3 V (3) +6 V (4) +9 V

Students may find similar question in CP exercise sheet :
[Chapter : Current electricity, Exercise # 2, Page No.199, Q.221]

Ans. **[4]**

Sol.



$V_B = V_A - 9$

$V_A - V_B = 9$ volt

Q.26 A filament bulb (500 W, 100 V) is to be used in 230 V main supply. When a resistance R is connected in series, it works perfectly and the bulb consumes 500 W. The value of R is

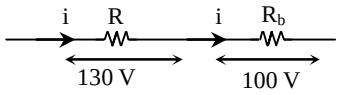
(1) 230 Ω (2) 46 Ω (3) 26 Ω (4) 13 Ω

Students may find similar question in CP exercise sheet :
[Chapter : Electric current, Exercise # 2, Page No.204, Q.81]

Ans. **[3]**

Sol. $P = \frac{V^2}{R}$

$R_b = \frac{V^2}{P} = \frac{10000}{500} = 20\ \Omega$



$i = \frac{100}{R_b} = \frac{130}{R}$

$\frac{100}{20} = \frac{130}{R}$

$R = 26\ \Omega$

Q.27 A long wire carrying a steady current is bent into a circular loop of one turn. The magnetic field at the centre of the loop is B. It is then bent into a circular coil of n turns. The magnetic field at the centre of this coil of n turns will be

(1) nB (2) n^2 B (3) 2nB (4) $2n^2$ B

Students may find similar question in CP exercise sheet :
[Chapter : Magnetic field, Exercise # 1, Page No.67, Q.86]

Ans. **[2]**

Sol. One turn loop

$B = \frac{\mu_0 i}{2R}$

n turn loop

$r = \frac{R}{n}$

$B' = \frac{\mu_0 ni}{2\frac{R}{n}}$

$B' = \left(\frac{\mu_0 i}{2R}\right) n^2$

$B' = n^2 B$

Q.28 A bar magnet is hung by a thin cotton thread in a uniform horizontal magnetic field and is in equilibrium state. The energy required to rotate it by 60° is W. Now the torque required to keep the magnet in this new position is

(1) $\frac{W}{\sqrt{3}}$ (2) $\sqrt{3}W$ (3) $\frac{\sqrt{3}W}{2}$ (4) $\frac{2W}{\sqrt{3}}$

Students may find similar question in CP exercise sheet :
[Chapter : Magnetic field, Exercise # 1, Page No.71, Q.121]

Ans. **[2]**

Sol. $W = MB(\cos 0° - \cos 60°)$

$W = MB\left(1 - \frac{1}{2}\right) = \frac{MB}{2}$

Required torque for this position

$\tau = MB \sin\theta$

$= MB \sin 60°$

$= \frac{\sqrt{3}}{2} MB = \sqrt{3}W$

Q.29 An electron is moving in a circular path under the influence of a transverse magnetic field of 3.57×10^{-2} T. If the value of e/m is 1.76×10^{11} C/kg, the frequency of revolution of the electron is

(1) 1 GHz (2) 100 MHz (3) 62.8 MHz (4) 6.28 MHz

Students may find similar question in CP exercise sheet :
[Chapter : Magnetic field, Exercise #3(A), Page No.83, Q.31]

Ans. **[1]**

Sol. $f = \frac{qB}{2\pi m}$

$= \left(\frac{q}{m}\right) \cdot \frac{B}{2\pi}$

$= \frac{1.76 \times 10^{11} \times 3.57 \times 10^{-2}}{2 \times 3.14}$

$= 1 \times 10^{9}$ Hz

$= 1$ GHz

Q.30 Which of the following combinations should be selected for better tuning of an L-C-R circuit used for communication ?

(1) R = 20 Ω, L = 1.5 H, C = 35 μF (2) R = 25 Ω, L = 2.5 H, C = 45 μF

(3) R = 15 Ω, L = 3.5 H, C = 30 μF (4) R = 25 Ω, L = 1.5 H, C = 45 μF

Students may find similar question in CP Class notes:
[Chapter : AC]

Ans. **[3]**

Sol. For better tuning quality factor should be high

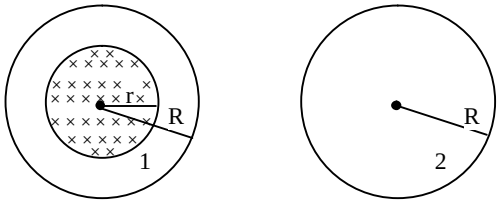
$$Q = \frac{1}{R}\sqrt{\frac{L}{C}}$$

for Q_{max}, R should be least

$\therefore$ Best answer is

R = 15 Ω, L = 3.5 H, C = 30μF

Q.31 A uniform magnetic field is restricted within a region of radius r. The magnetic field changes with time at a rate $\frac{d\vec{B}}{dt}$. Loop 1 of radius R > r enclosed the region r and loop 2 of radius R is outside the region of magnetic field as shown in the figure below. Then the e.m.f. generated is



(1) Zero in loop 1 and zero in loop 2

(2) $-\frac{d\vec{B}}{dt}\pi r^2$ in loop 1 and $-\frac{d\vec{B}}{dt}\pi r^2$ in loop 2

(3) $-\frac{d\vec{B}}{dt}\pi R^2$ in loop 1 and zero in loop 2

(4) $-\frac{d\vec{B}}{dt}\pi r^2$ in loop 1 and zero in loop 2

Students may find similar question in CP exercise sheet :
[Chapter : EMI, Exercise # 3(A), Page No.176, Q.26]

Ans. **[4]**

Sol. Induced e.m.f. in loop (1)

$$e = -\frac{d\phi}{dt} = -\frac{AdB}{dt}$$

$$= -\pi r^2 \frac{dB}{dt}$$

Induced e.m.f. in loop (2)

Loop (2) is not in magnetic field so no field change so induced e.m.f. = 0

Q.32 The potential differences across the resistance, capacitance and inductance are 80 V, 40 V and 100 V respectively in an L-C-R circuit . The power factor of this circuit is

(1) 0.4 (2) 0.5 (3) 0.8 (4) 1.0

Students may find similar question in CP exercise sheet :
[Chapter : AC, Exercise # 1, Page No.228, Q.14]

Ans. **[3]**

Sol. $\cos\phi = \frac{V_R}{V_{net}} = \frac{V_R}{\sqrt{(V_L - V_C)^2 + V_R^2}}$

$= \frac{80}{\sqrt{(100-40)^2 + 80^2}} = \frac{80}{100} = 0.8$

Q.33 A 100 Ω resistance and a capacitor of 100 Ω reactance are connected in series across a 220 V source. When the capacitor is 50% charged, the peak value of the displacement current is

(1) 2.2 A (2) 11 A (3) 4.4 A (4) $11\sqrt{2}$A

Students may find similar question in CP exercise sheet :
[Chapter : AC, Exercise # 2, Page No.230, Q.34]

Ans. **[1]**

Sol. $X_C = 100$

$R = 100$

$Z = \sqrt{(100)^2 + (100)^2} = 100\sqrt{2}$

$I = \frac{E}{Z} = \frac{220}{100\sqrt{2}} = \frac{2.2}{\sqrt{2}}$

$I_0 = \sqrt{2}\ I = \frac{2.2}{\sqrt{2}} \times \sqrt{2} = 2.2A$

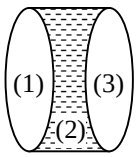
Q.34 Two identical glass (μ_g = 3/2) equiconvex lenses of focal length f each are kept in contact. The space between the two lenses is filled with water (μ_w = 4/3). The focal length of the combination is

(1) f/3 (2) f (3) 4f/3 (4) 3f/4

Students may find similar question in CP exercise sheet :
[Chapter : Rays optics , Exercise # 3(A), Page No.72, Q.35]

Ans. **[4]**

Sol.



For equiconvex lens

$\frac{1}{A} = \left(\frac{3}{2} - 1\right)\left(\frac{1}{R} - \frac{1}{-R}\right)$

$\frac{1}{f} = \frac{1}{2} \cdot \frac{2}{R}$

$R = f$

For 2nd lens $\frac{1}{f_2} = \left(\frac{4}{3} - 1\right)\left(\frac{1}{-f} - \frac{1}{-f}\right)$

$\frac{1}{f_2} = \frac{1}{3} \times \frac{2}{-f}$

$f_2 = \frac{-3f}{2}$

For combination

$\frac{1}{f'} = \frac{1}{f_1} + \frac{1}{f_2} + \frac{1}{f_3}$

$= \frac{1}{f} + \frac{2}{-3f} + \frac{1}{f}$

$\frac{1}{f'} = \frac{3-2+3}{3f} = \frac{4}{3f}$

$f' = \frac{3f}{4}$

Q.35 An air bubble in a glass slab with refractive index 1.5 (near normal incidence) is 5 cm deep when viewed from one surface and 3 cm deep when viewed from the opposite face. The thickness (in cm) of the slab is

(1) 8 (2) 10 (3) 12 (4) 16

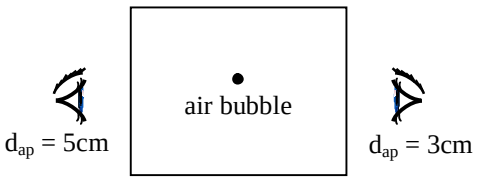
Students may find similar question in CP exercise sheet :
[Chapter : Rays optics, Exercise # 3(A), Page No.69, Q.6]

Ans. **[3]**

Sol. $d_{ap} = \frac{d_{ac}}{\mu}$

$(5 + 3) = \frac{d_{ac}}{1.5}$

$d_{ac} = (5 + 3)(1.5) = 12$ cm



Q.36 The interference pattern is obtained with two coherent light sources of intensity ratio n. In the interference pattern, the ratio $\frac{I_{max} - I_{min}}{I_{max} + I_{min}}$ will be

(1) $\frac{\sqrt{n}}{n+1}$ (2) $\frac{2\sqrt{n}}{n+1}$ (3) $\frac{\sqrt{n}}{(n+1)^2}$ (4) $\frac{2\sqrt{n}}{(n+1)^2}$

Students may find similar question in CP exercise sheet :
[Chapter : Interference of light, Exercise # 1(B), Page No.92, Q.40]

Ans. **[2]**

Sol. $I_{max} = \left(\sqrt{I} + \sqrt{nI}\right)^2$

$I_{min} = \left(\sqrt{I} - \sqrt{nI}\right)^2$

$$\frac{I_{max} - I_{min}}{I_{max} + I_{min}} = \frac{(\sqrt{I} + \sqrt{nI})^2 - (\sqrt{I} - \sqrt{nI})^2}{(\sqrt{I} + \sqrt{nI})^2 + (\sqrt{I} - \sqrt{nI})^2}$$

$$= \frac{1+n+2\sqrt{n}-1-n+2\sqrt{n}}{1+n+2\sqrt{n}+1+n-2\sqrt{n}} = \frac{4\sqrt{n}}{2+2n} = \frac{2\sqrt{n}}{1+n}$$

Q.37 A person can see clearly objects only when they lie between 50 cm and 400 cm from his eyes. In order to increase the maximum distance of distinct vision to infinity, the type and power of the correcting lens, the person has to use, will be

(1) convex, + 2.25 diopter (2) concave, – 0.25 diopter

(3) concave, – 0.2 diopter (4) convex, + 0.15 diopter

Students may find similar question in CP exercise sheet :

[Chapter : Ray optics, Exercise # 3(B), Page No.75, Q.32]

Ans. **[2]**

Sol. $\frac{1}{v} - \frac{1}{u} = P$

$\frac{1}{-4m} - \frac{1}{\infty} = P$

$P = -0.25$ D

And lens is concave

Q.38 A linear aperture whose width is 0.02 cm is placed immediately in front of a lens of focal length 60 cm. The aperture is illuminated normally by a parallel beam of wavelength 5×10^{-5} cm. The distance of the first dark band of the diffraction pattern from the centre of the screen is

(1) 0.10 cm (2) 0.25 cm (3) 0.20 cm (4) 0.15 cm

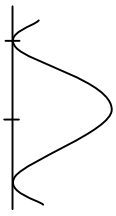
Students may find similar question in CP exercise sheet :

[Chapter : Diffraction, Exercise #1, Page No.105, Q.16]

Ans. **[4]**

Sol.

$\frac{\lambda f}{d} = x$



$$x = \frac{5\times10^{-5}\times60}{0.02}$$

$$x = \frac{300\times10^{-5}}{0.02} = 0.15 \text{ cm}$$

Q.39 Electrons of mass m with de-Broglie wavelength λ fall on the target in an X-ray tube. The cutoff wavelength (λ_0) of the emitted X-ray is

(1) $\lambda_0 = \frac{2mc\lambda^2}{h}$ (2) $\lambda_0 = \frac{2h}{mc}$ (3) $\lambda_0 = \frac{2m^2c^2\lambda^3}{h^2}$ (4) $\lambda_0 = \lambda$

Students may find similar question in CP exercise sheet :
[Chapter : X-Rays, Exercise # 3(B), Page No.140, Q.44]

Ans. **[1]**

Sol. $\lambda_0 = \frac{hc}{KE_e}$ | $\lambda = \frac{h}{\sqrt{2mKE_e}}$

$\lambda_0 = \frac{hc}{h^2/2m\lambda^2}$ | $KE_e = \frac{h^2}{2m\lambda^2}$

$$\boxed{\lambda_0 = \frac{2mc}{h}\lambda^2}$$

Q.40 Photons with energy 5 eV are incident on a cathode C in a photoelectric cell. The maximum energy of emitted photoelectrons is 2 eV. When photons of energy 6 eV are incident on C, no photoelectrons will reach the anode A, if the stopping potential of A relative to C is

(1) +3 V (2) +4 V (3) –1 V (4) –3 V

Students may find similar question in CP exercise sheet :
[Chapter : Photo electric effect, Exercise # 2, Page No.81, Q.23]

Ans. **[4]**

Sol. $W = 5 - 2 = 3$ eV

$KE_{max} = 6 - 3 = 3$ eV

$V_0 = -3$ volt

Q.41 If an electron in a hydrogen atom jumps from the 3rd orbit to the 2nd orbit, it emits a photon of wavelength λ. When it jumps from the 4th orbit to the 3rd orbit, the corresponding wavelength of the photon will be

(1) $\frac{16}{25}\lambda$ (2) $\frac{9}{16}\lambda$ (3) $\frac{20}{7}\lambda$ (4) $\frac{20}{13}\lambda$

Students may find similar question in CP Class notes:
[Chapter : Atomic structure]

Ans. **[3]**

Sol. $\frac{1}{\lambda} = R(1)^2\left(\frac{1}{2^2} - \frac{1}{3^2}\right)$

$\frac{1}{\lambda_2} = R(1)^2\left(\frac{1}{3^2} - \frac{1}{4^2}\right)$

$\frac{\frac{1}{\lambda}}{\frac{1}{\lambda_2}} = \frac{\frac{1}{4} - \frac{1}{9}}{\frac{1}{9} - \frac{1}{16}} = \frac{\frac{5}{4\times 9}}{\frac{16-9}{9\times 16}}$

$\frac{\lambda_2}{\lambda} = \frac{5}{4\times 9} \times \frac{9\times 16}{7} = \frac{20}{7}$

$$\boxed{\lambda_2 = \frac{20}{7}\lambda}$$

Q.42 The half-life of a radioactive substance is 30 minutes. The time (in minutes) taken between 40% decay and 85% decay of the same radioactive substance is

(1) 15 (2) 30 (3) 45 (4) 60

Students may find similar question in CP exercise sheet :
[Chapter : Radioactivity, Exercise # 3(A), Page No.52, Q.24]

Ans. **[4]**

Sol. $D.P_1 = 40\ \% \Rightarrow A.P_1 = 60\% \Rightarrow t_1$

$D.P_2 = 85\ \% \Rightarrow A.P_2 = 15\% \Rightarrow t_2$

$$t_1 = 3.32\ T_{1/2} \log_{10}\left(\frac{1}{A.P_1}\right)$$

$$t_2 = 3.32\ T_{1/2} \log_{10}\left(\frac{1}{A.P_2}\right)$$

$$t_2 - t_1 = 3.32\ T_{1/2}\left[\log_{10}\left(\frac{A.P_1}{A.P_2}\right)\right]$$

$$= 3.32 \times 30\left[\log_{10}\left(\frac{60/100}{15/100}\right)\right]$$

$$= 3.32 \times 30 \log_{10}4$$

$$= 3.32 \times 30 \times 2\log_{10}2$$

$$= 59.95$$

$$= 60$$

Q.43 For CE transistor amplifier, the audio signal voltage across the collector resistance of 2 kΩ is 4 V. If the current amplification factor of the transistor is 100 and the base resistance is 1 kΩ, then the input signal voltage is

(1) 10 mV (2) 20 mV (3) 30 mV (4) 15 mV

Students may find similar question in CP exercise sheet :
[Chapter : Electronics, Exercise # 3(A), Page No.199, Q.68]

Ans. **[2]**

Sol. $\beta = 100$

$R_C = 2\ k\Omega$

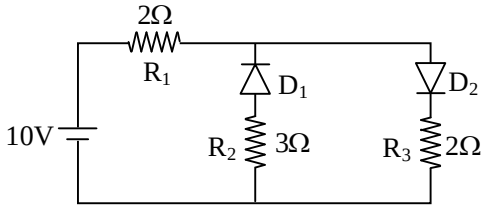
$v_0 = 4\ V$

$R_B = 1\ k\Omega$

$$A = \frac{v_0}{v_i} = \beta\frac{R_C}{R_B}$$

$$v_i = \frac{v_0 \times R_B}{\beta R_C} = \frac{4\times10}{100\times2\times10^3} = 20\ mV$$

Q.44 The given circuit has two ideal diodes connected as shown in the figure below. The current flowing through the resistance R_1 will be



(1) 2.5 A (2) 10.0 A (3) 1.43 A (4) 3.13 A

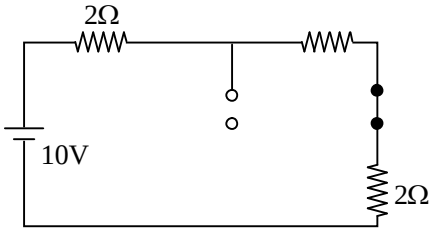
Students may find similar question in CP exercise sheet :
[Chapter : Electronics, Exercise # 3(B), Page No.209, Q.113]

Ans. **[1]**

Sol. $D_1 \rightarrow RB$

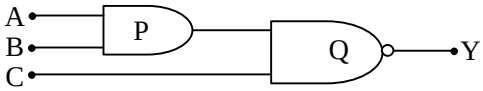
$D_2 \rightarrow FB$

So equivalent circuit



$$I = \frac{10}{2+2} = 2.5 \text{ A}$$

Q.45 What is the output Y in the following circuit, when all the three inputs A, B, C are first 0 and then 1 ?

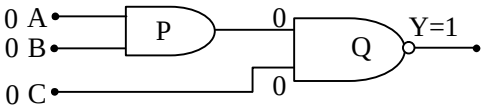


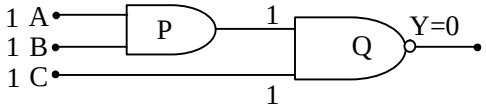
(1) 0, 1 (2) 0, 0 (3) 1, 0 (4) 1, 1

Students may find similar question in CP exercise sheet :
[Chapter : Electronics, Exercise # 3(A), Page No.200, Q.17]

Ans. **[3]**

Sol.





Q.46 Which one of the following compounds shows the presence of intramolecular hydrogen bond?

(1) H_2O_2

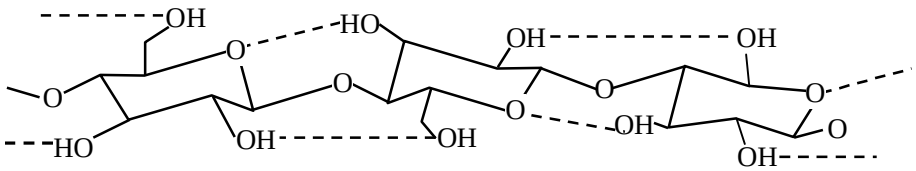
(2) HCN

(3) Cellulose

(4) Concentrated acetic acid

Ans. **[3]**

Sol. The chain conformations of cellulose stabilised by two hydrogen bonds parallel to the glycosidic linkage



Q.47 The molar conductivity of a 0.5 mol/dm^3 solution of $AgNO_3$ with electrolytic conductivity of 5.76×10^{-3} S cm^{-1} at 298 K is

(1) 2.88 S cm^2 / mol

(2) 11.52 S cm^2 / mol

(3) 0.086 S cm^2 / mol

(4) 28.8 S cm^2 / mol

Students may find similar question in CP exercise sheet :

[Chapter : Electro Chemistry, Exercise # 1, Page No.15, Q.18]

Ans. **[2]**

Sol. M = 0.5 M

$$\wedge_m = K \times \frac{1000}{M}$$

$$= 5.76 \times 10^{-3} \times \frac{1000}{0.5}$$

$$= 11.52 \text{ S cm}^2 / \text{mol}$$

Q.48 The decomposition of phosphine [PH_3] on tungsten at low pressure is a first-order reaction. It is because the

(1) rate is proportional to the surface coverage

(2) rate is inversely proportional to the surface coverage

(3) rate is independent of the surface coverage

(4) rate of decomposition is very slow

Students may find similar question in CP exercise sheet :
[Chapter : Similar Theory Surface Chemistry, Page No.146]

Ans. **[1]**

Sol. For the decomposition of gas in the presence of heterogenous catalyst

$$A(g) \underset{k_{-1}}{\overset{k_1}{\rightleftharpoons}} A_{ads} \xrightarrow{k_2} \text{Product}$$

$$k_1 >> k_{-1}$$

rate of formation of product $r = k_2\theta_A$

θ_A = surface coverage of solid catalyst

$\therefore$ According to Langmuir adsorption isotherm

$$\text{rate} = k_2\theta_A$$

or $$\text{rate} = k_2 \frac{k_A P_A}{1 + k_A P_A}$$

at low pressure $P_A \to 0$; θ_A is very small and proportional to P_A (pressure of gas)

$\therefore$ reaction became I^{st} order

rate law, $\text{rate} = k_2 k_A P_A$

$\therefore$ rate is dependent of θ_A i.e. surface area covered

Q.49 The coagulation values in millimoles per litre of the electrolytes used for the coagulation of As_2S_3 are given below :

I. (NaCl) = 52,

II. ($BaCl_2$) = 0.69,

III. ($MgSO_4$) = 0.22

The **correct** order of the their coagulating power is

(1) I > II > III (2) II > I > III (3) III > II > I (4) III > I > II

Students may find similar question in CP exercise sheet :
[Chapter : Surface Chemistry, Exercise # 2, Page No.156, Q.20]

Ans. **[3]**

Sol. $$\text{Coagulation power} \propto \frac{1}{\text{coagulation no. or value}}$$

I < II < III

Q.50 During the electrolysis of molten sodium chloride, the time required to produce 0.10 mol of chlorine gas using a current of 3 amperes is

(1) 55 minutes (2) 110 minutes (3) 220 minutes (4) 330 minutes

Students may find similar question in CP exercise sheet :
[Chapter : Electro Chemistry, Exercise # 1, Page No.16, Q.39]

Ans. **[2]**

Sol. $2Cl^- \rightarrow Cl_2 + 2e^-$

0.1 mole 0.2 F

$Q = I\,t$

$0.2 \times 96500 = 3 \times t$

$t = \frac{0.2 \times 96500}{3 \times 60}$ min = 107.22 min.

Q.51 How many electrons can fit in the orbital for which n = 3 and l = 1 ?

(1) 2 (2) 6 (3) 10 (4) 14

Students may find similar question in CP exercise sheet :
[Chapter :Atomic Structure, Exercise # 3B, Page No.36, Q.22]

Ans. **[1]**

Sol. n = 3 $\ell = 1$

3p orbital

In an orbital maximum two electron can fill.

Q.52 For a sample of perfect gas when its pressure is changed isothermally from p_i to p_f, the entropy change is given by

(1) $\Delta S = nR \ln\left(\frac{p_f}{p_i}\right)$ (2) $\Delta S = nR \ln\left(\frac{p_i}{p_f}\right)$

(3) $\Delta S = nRT \ln\left(\frac{p_f}{p_i}\right)$ (4) $\Delta S = RT \ln\left(\frac{p_i}{p_f}\right)$

Students may find similar question in CP Class Notes :
[Chapter : Thermodynamics]

Ans. **[2]**

Sol. $\Delta S = nR\,\ell n\,\frac{P_i}{P_f}$

Q.53 The van't Hoff factor (i) for a dilute aqueous solution of the strong electrolyte barium hydroxide is

(1) 0 (2) 1 (3) 2 (4) 3

Students may find similar question in CP exercise sheet :
[Chapter : Solution & Colligative property, Exercise # 3A, Page No.75, Q.5]

Ans. **[4]**

Sol. $Ba(OH)_2$

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

$1 = \frac{i-1}{3-1}$

$i = 3$

Q.54 The percentage of pyridine (C_5H_5N) that forms pyridinium ion ($C_5H_5N^+H$) in a 0.10 M aqueous pyridine solution (K_b for $C_5H_5N = 1.7 \times 10^{-9}$) is

(1) 0.0060% (2) 0.013% (3) 0.77% (4) 1.6%

Students may find similar question in CP exercise sheet :
[Chapter : Ionic Equilibrium, Examples 36, Page No.138]

Ans. **[2]**

Sol. $\alpha = \sqrt{\frac{K_b}{C}}$

$= \sqrt{\frac{1.7\times10^{-9}}{0.1}}$

$= \sqrt{1.7\times10^{-8}}$

$= 1.3 \times 10^{-4}$

$= 1.3 \times 10^{-2}$ %

Q.55 In calcium fluoride, having the fluorite structure, the coordination numbers for calcium ion (Ca^{2+}) and fluoride ion (F^-) are

(1) 4 and 2 (2) 6 and 6 (3) 8 and 4 (4) 4 and 8

Students may find similar question in CP exercise sheet :
[Chapter : Solid State, Exercise # 3A, Page No.122, Q.6]

Ans. **[3]**

Sol. CaF_2 is a Flourite structure

So, Co-ordination no. ratio

Ca^{+2} F^-

8 : 4

Q.56 If the E°_{cell} for a given reaction has a negative value, which of the following gives the **correct** relationships for the values of ΔG° and K_{eq} ?

(1) $\Delta G^\circ > 0$; $K_{eq} < 1$ (2) $\Delta G^\circ > 0$; $K_{eq} > 1$

(3) $\Delta G^\circ < 0$; $K_{eq} > 1$ (4) $\Delta G^\circ < 0$; $K_{eq} < 1$

Students may find similar question in CP exercise sheet :
[Chapter : Electro Chemistry, Exercise # 3A, Page No.33, Q.49]

Ans. **[1]**

Sol. $\Delta G^o = -nFE^o$

E^o is negative

So ΔG^o = +ve

$\Delta G^o = -2.303\ RT \log K$

$\therefore K_{eq} < 1$

Q.57 Which one of the following is **incorrect** for ideal solution ?

(1) $\Delta H_{mix} = 0$ (2) $\Delta U_{mix} = 0$

(3) $\Delta P = P_{obs} - P_{calculated\ by\ Raoult's\ law} = 0$ (4) $\Delta G_{mix} = 0$

Students may find similar question in CP Class Notes :
[Chapter : Solution & Colligative property]

Ans. **[4]**

Sol. ΔG_{mix} should be less than zero

Q.58 The solubility of AgCl (s) with solubility product 1.6×10^{-10} in 0.1 M NaCl solution would be :

(1) 1.26×10^{-5} M (2) 1.6×10^{-9} M (3) 1.6×10^{-11} M (4) zero

Students may find similar question in CP exercise sheet :
[Chapter : Ionic Equilibrium, Exercise # 3A, Page No.49, Q.49]

Ans. **[2]**

Sol.

$$\underset{(s)}{AgCl} \rightleftharpoons Ag^+ + Cl^-$$

Initial solubility	–	0	0
Eq^m	–	S^1	S^1

$$NaCl \longrightarrow Na^+ + Cl^-$$

Initial	C	0	0
Final	0	C	C

So Ionic product $Q = K_{sp} = [Ag^+]\,[Cl^-]$

$K_{sp} = (S^1)\ (C)$

$\because$ Cl^- ion due to common ion obtained from NaCl

$$S^1 = \frac{K_{sp}}{C} = \frac{1.6\times10^{-10}}{0.1} = 1.6 \times 10^{-9}$$

Q.59 Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2. When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of X_3Y_2 weighs 9 g, the atomic weights of X and Y are

(1) 40, 30 (2) 60, 40 (3) 20, 30 (4) 30, 20

Students may find similar question in CP exercise sheet :
[Chapter : Atom, Molecule & Chemical Arithmetic, Exercise # 2, Page No.72, Q.12]

Ans. **[1]**

Sol. XY_2

0.1 mole weight = 10 g

$\therefore$ 1 mole weight = ? = 100 g mol wt

X_3Y_2

0.05 mole weight = 9 g

$\therefore$ 1 mole weight = ? = $\frac{9}{0.05} = 180\,g\,mol.wt$

$\therefore$ For XY_2

$a + 2b = 100$ ....(1)

For X_3Y_2

$3a + 2b = 180$ …(2)

equation (2) – (1)

$2a = 80$

$a = 40$

and $b = 30$

Q.60 The number of electrons delivered at the cathode during electrolysis by a current of 1 ampere in 60 seconds is (change on electron = 1.60×10^{-19}C)

(1) 6×10^{23} (2) 6×10^{20} (3) 3.75×10^{20} (4) 7.48×10^{23}

Students may find similar question in CP exercise sheet :
[Chapter : Electro Chemistry, Exercise # 1, Page No.17, Q.43]

Ans. **[3]**

Sol. $Q = ne$

$I \times t = ne$

$$n = \frac{1 \times 60}{1.6 \times 10^{-19}}$$

$n = 3.75 \times 10^{20}$

Q.61 Boric acid is an acid because its molecule

(1) contains replaceable H^+ ion

(2) gives up a proton

(3) accepts OH^- from water releasing proton

(4) combines with proton from water molecule

Students may find similar question in CP exercise sheet :
[Chapter : p-block, Exercise # 2, Page No.38, Q.15]

Ans. **[3]**

Sol. Boric acid is electron deficient so accept *l*.p. of electron from water.

$B(OH)_3 + H–OH \rightarrow [B(OH)_4]^- + H^+$

Q.62 AlF_3 is soluble in HF only in presence of KF. It is due to the formation of

(1) $K_3[AlF_3H_3]$ (2) $K_3[AlF_6]$ (3) AlH_3 (4) $K[AlF_3H]$

Students may find similar question in CP Class Notes :
[Chapter : Co-ordination compound]

Ans. **[2]**

Sol. KF dissociate to give F^- and form soluble complex with AlF_3

$AlF_3 + 3KF \rightarrow K_3[AlF_6]$

Q.63 Zinc can be coated on iron to produce galvanized iron but the reverse is not possible. It is because

(1) zinc is lighter than iron

(2) zinc has lower melting point than iron

(3) zinc has lower negative electrode potential than iron

(4) zinc has higher negative electrode potential than iron

Students may find similar question in CP exercise sheet :
[Chapter : Electro Chemistry, Exercise # 1, Page No.14, Q.7]

Ans. **[4]**

Sol. Theory Based

Q.64 The suspension of slaked lime in water is known as

(1) limewater (2) quicklime

(3) milk of lime (4) aqueous solution of slaked lime

Students may find similar question in CP Class Notes :

[Chapter : Surface Chemistry]

Ans. **[3]**

Sol. Calcium hydroxide is prepared by adding water to quick lime, CaO.

It is a white amorphous powder. It is sparingly soluble in water. The aqueous solution is known as **lime water** and a suspension of slaked lime in water is known as milk of lime.

Q.65 The hybridizations of atomic orbitals of nitrogen in NO_2^+, NO_3^- and NH_4^+ respectively are

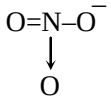
(1) sp, sp^3 and sp^2 (2) sp^2, sp^3 and sp (3) sp, sp^2 and sp^3 (4) sp^2, sp and sp^3

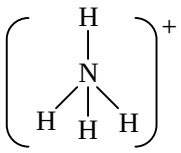
Students may find similar question in CP exercise sheet :

[*Chapter : Chemical Bonding, Exercise # 3B, Page No.235, Q.125*]

Ans. **[3]**

Sol. $\overset{+}{N}O_2$ $O=\overset{+}{N}=O$ sp

NO_3^-  sp^2

NH_4^+  sp^3

Q.66 Which of the following fluoro-compound is most likely to behave as a Lewis base ?

(1) BF_3 (2) PF_3 (3) CF_4 (4) SiF_4

Students may find similar question in CP exercise sheet :

[*Chapter : p-block, Exercise # 2, Page No.38, Q.29*]

Ans. **[2]**

Sol. $\ddot{P}F_3$ act as lewis base due to presence of lone pair.

Q.67 Which of the following pairs of ions is isoelectronic and isostructural?

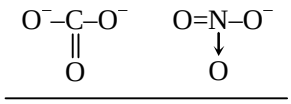
(1) CO_3^{2-}, NO_3^- (2) ClO_3^-, CO_3^{2-} (3) SO_3^{2-}, NO_3^- (4) ClO_3^-, SO_3^{2-}

Students may find similar question in CP exercise sheet :

[*Chapter : Chemical Bonding, Exercise # 3B, Page No.235, Q.120*]

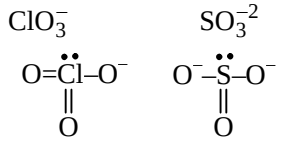
Ans. **[1,4]**

Sol. CO_3^{-2} & NO_3^- are isoelectronic and isostructral.



sp^2, trigonal planar

ClO_3^- and SO_3^{-2} are also isoelectronic and isostructural



sp^3, pyramid

Q.68 In context with beryllium, which one of the following statements is **incorrect** ?

(1) It is rendered passive by nitric acid

(2) It forms Be_2C

(3) Its salts rarely hydrolyze

(4) Its hydride is electron-deficient and polymeric

Students may find similar question in CP Class Notes :
[Chapter : s-block]

Ans. **[3]**

Sol. Beryllium salt are hydrolysed

$BeCl_2 + 2HOH \rightarrow Be(OH)_2 + 2HCl$

Q.69 Hot concentrated sulphuric acid is a moderately strong oxidizing agent. Which of the following reaction **does not** show oxidizing behaviour?

(1) $Cu + 2H_2SO_4 \rightarrow CuSO_4 + SO_2 + 2H_2O$

(2) $3S + 2H_2SO_4 \rightarrow 3SO_2 + 2H_2O$

(3) $C + 2H_2SO_4 \rightarrow CO_2 + 2SO_2 + 2H_2O$

(4) $CaF_2 + H_2SO_4 \rightarrow CaSO_4 + 2HF$

Students may find similar question in CP Class Notes :
[Chapter : p-block]

Ans. **[4]**

Sol. Concentrated H_2SO_4 act strong oxidizing agent so oxidizes non metal

$$\overset{0}{C} + 2\overset{+6}{H_2}\overset{+6}{S}O_4 \rightarrow \overset{+4}{C}O_2 + 2\overset{+4}{S}O_2 + 2H_2O$$

$$3\overset{0}{S} + 2\overset{+6}{H_2}\overset{+6}{S}O_4 \rightarrow 3\overset{+4}{S}O_2 + 2H_2O$$

$$\overset{0}{Cu} + \overset{+6}{H_2}\overset{+6}{S}O_4 \rightarrow \overset{+2}{Cu}\overset{+6}{S}O_4 + \overset{+4}{S}O_2 + H_2O$$

$$\overset{-1}{Ca}\overset{+6}{F_2} + \overset{+6}{H_2}\overset{+6}{S}O_4 \rightarrow \overset{+6}{Ca}\overset{+6}{S}O_4 + 2\overset{-1}{H}\overset{-1}{F}$$

Q.70 Which of the following pairs of d-orbitals will have electron density along the axes?

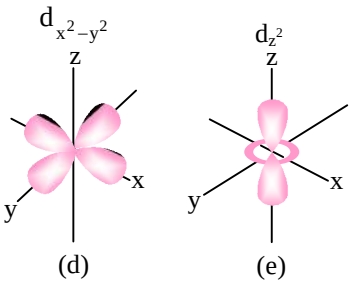
(1) d_{z^2}, d_{xz} (2) d_{xz}, d_{yz}

(3) d_{z^2}, $d_{x^2-y^2}$ (4) d_{xy}, $d_{x^2-y^2}$

Students may find similar question in CP exercise sheet :
[Chapter : Co-ordination, Class Notes]

Ans. **[3]**

Sol. d_{z^2} and $d_{x^2-y^2}$ orbital have electron density along the axes.



(d) (e)

Q.71 The correct geometry and hybridization for XeF_4 are

(1) octahedral, sp^3d^2 (2) trigonal bipyramidal, sp^3d

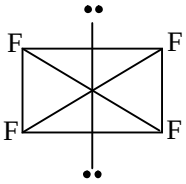
(3) planar triangle, sp^3d^3 (4) square planar, sp^3d^2

Students may find similar question in CP exercise sheet :
[Chapter : Chemical bonding, Class Notes]

Ans. **[4]**

Sol. $\ddot{X}eF_4$ Hybridization $\rightarrow sp^3d^2$

Geometry $\rightarrow$ Octahedral



Q.72 Among the following, which one is a **wrong** statement?

(1) PH_5 and $BiCl_5$ do not exist

(2) $p\pi$-$d\pi$ bonds are present in SO_2

(3) SeF_4 and CH_4 have same shape

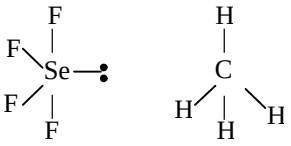
(4) I_3^+ has bent geometry

Students may find similar question in CP exercise sheet :
[Chapter : Chemical bonding, Exercise # 2, Page No. 224, Q 48]

Ans. **[3]**

Sol. SeF_4 and CH_4 have different shape.

SeF_4	CH_4
sp^3d	sp^3



See -saw tetrahedral

Q.73 The **correct** increasing order of trans-effect of the following species is

(1) $NH_3 > CN^- > Br^- > C_6H_5^-$

(2) $CN^- > C_6H_5^- > Br^- > NH_3$

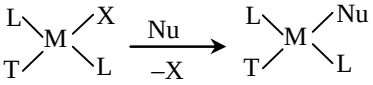
(3) $Br^- > CN^- > NH_3 > C_6H_5^-$

(4) $CN^- > Br^- > C_6H_5^- > NH_3$

Students may find similar question in CP exercise sheet :
[Chapter : Co-ordination, Class Notes]

Ans. **[2]**

Sol. The trans effect is defined as the effect of a ligand over rate of subsitution of another ligand positioned trans to it in the square planer complexes.



π - accepter ligands increase the strength of M-L bond in the trans position.

$NO^+ > CO > CN^- > C_2H_4 > Ph^- > NO_2^- > I^-$

$SCN^- > Br^- > Cl^- > Py > NH_3 > OH^- > H_2O$

Q.74 Which one of the following statements related to lanthanons is **incorrect** ?

(1) Europium shows +2 oxidation state

(2) The basicity decreases as the ionic radius decreases from Pr to Lu

(3) All the lanthanons are much more reactive than aluminium

(4) Ce (+4) solutions are widely used as oxidizing agent in volumetric analysis

Students may find similar question in CP exercise sheet :
[Chapter :Coordination, f-block, Exercise # XIB, Page No 77, Q.121]

Ans. **[3]**

Sol. The earlier number of lanthenoide series are quiet reactive similar to calcium but with increasing atomic number they behave more like aluminium.

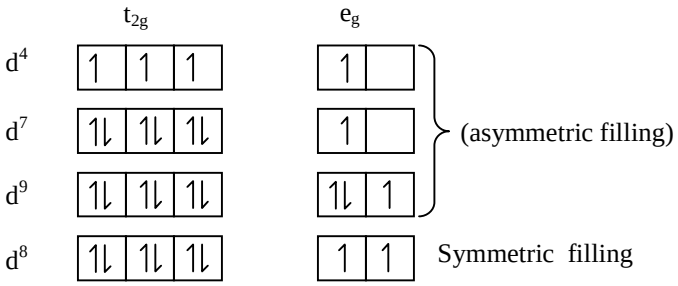
Q.75 Jahn-Teller effect is **not** observed in high spin complexes of

(1) d^7 (2) d^8 (3) d^4 (4) d^9

Students may find similar question in CP exercise sheet :
[Chapter : Co-ordination, Class Notes]

Ans. **[2]**

Sol. Asymmetric filling of the e_g orbitals results in some ligands being repelled more than other. This cause a significant distortion of the octahedral complexes is called Jahon-teller effect.



Q.76 Which of the following can be used as the halide component for Friedel-Crafts reaction?

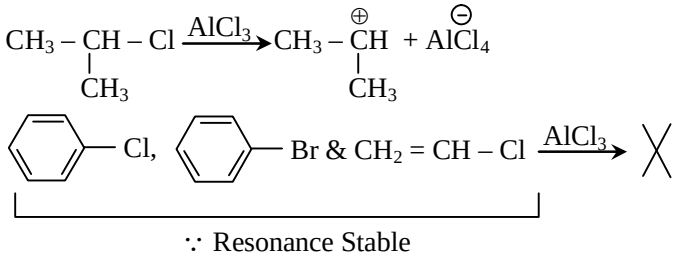
(1) Chlorobenzene (2) Bromobenzene

(3) Chloroethene (4) Isopropyl chloride

Students may find similar question in CP exercise sheet :
[Chapter : Aromatic hydrocarbon, Exercise # 5, Page No.190, Q. 37]

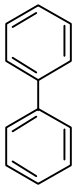
Ans. **[4]**

Sol.



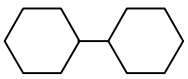
∵ Resonance Stable

Q.77 In which of the following molecules, all atoms are coplanar ?

(1) 

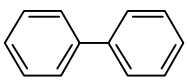
(2) 

(3) $\begin{matrix} CH_3 \\ CH_3 \end{matrix}\!\!>\!C = C\!<\!\begin{matrix} CN \\ CN \end{matrix}$

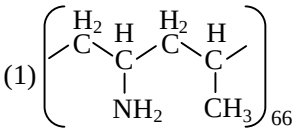
(4) 

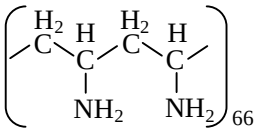
Students may find similar question in CP Class Notes :
[Chapter :GOC-1]

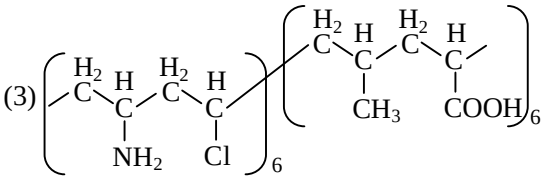
Ans. **[1]**

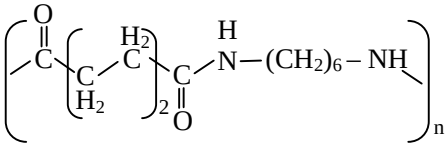
Sol.  has all sp^2 carbons so it is co-planar molecule.

Q.78 Which one of the following structures represents nylon 6,6 polymer?

(1) 

(2) 

(3) 

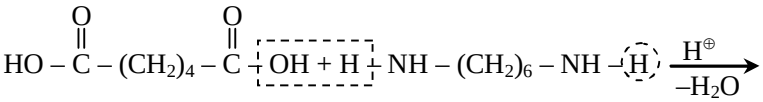
(4) 

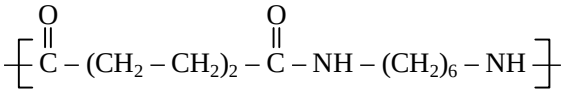
Students may find similar question in CP exercise sheet :

[*Chapter : Polymer, Exercise # 2, Page No. 199, Q.48*]

Ans. **[4]**

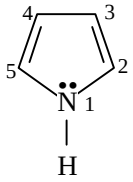
Sol.





Nylon – 6, 6

Q.79 In pyrrole



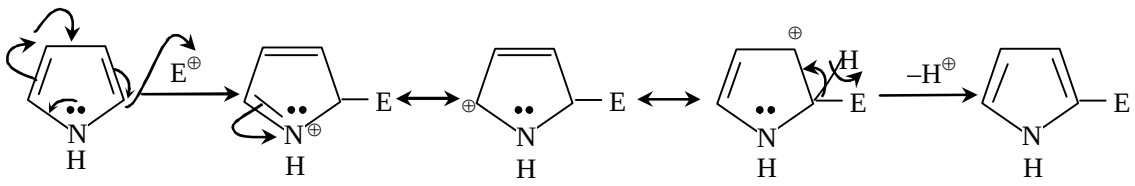
the electron density is maximum on

(1) 2 and 3 (2) 3 and 4 (3) 2 and 4 (4) 2 and 5

Students may find similar question in CP Class Notes :

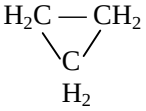
[Chapter : GOC-II]

Ans. **[4]**

Sol. 

Pyrrole has highest electron density at C_2 and C_5 due to highest stability of protonated intermediate.

Q.80 Which of the following compounds shall **not** produce propene by reaction with HBr followed by elimination or direct only elimination reaction ?

(1) 

(2) $H_3 - \overset{H_2}{C} - CH_2OH$

(3) $H_2C = C = O$

(4) $H_3C - \overset{H_2}{C} - CH_2Br$

Students may find similar question in CP Class Notes:
[Chapter : Oxygen compound (acid derivative)]

Ans. **[3]**

Sol. 

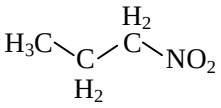
$$CH_3 - CH_2 - \underset{OH}{CH_2} \xrightarrow{HBr} CH_3 - \underset{Br}{CH} - CH_3 \xrightarrow{-HBr} CH_3 - CH = CH_2$$

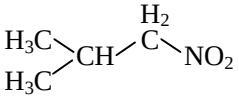
$$CH_2 = C = O \xrightarrow{HBr} CH_2 = C\begin{matrix}Br\\OH\end{matrix} \rightleftharpoons^{T} CH_3 - \overset{O}{\overset{\|}{C}} - Br$$

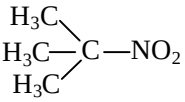
(Not propene)

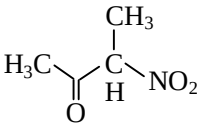
$$CH_3 - CH_2 - \underset{Br}{CH_2} \xrightarrow{-HBr} CH_3 - CH = CH_2$$

Q.81 Which one of the following nitro compounds **does not** react with nitrous acid ?

(1) 

(2) 

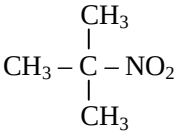
(3) 

(4) 

Students may find similar question in CP Class Notes :
[Chapter :Nitrogen compounds]

Ans. **[3]**

Sol. Nitro Compounds $\underset{(\alpha H = absent)}{\xrightarrow{HNO_2}}$ No Reaction

$\therefore$  Will be the answer

Q.82 The central dogma of molecular genetics states that the genetics information flows from :

(1) Amino acids $\rightarrow$ Proteins $\rightarrow$ DNA

(2) DNA $\rightarrow$ Carbohydrates $\rightarrow$ Proteins

(3) DNA $\rightarrow$ RNA $\rightarrow$ Proteins

(4) DNA $\rightarrow$ RNA $\rightarrow$ Carbohydrates

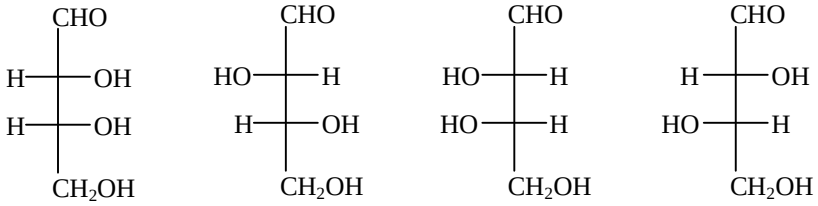
Students may find similar question in CP exercise sheet :
[Chapter : Biomolecules, Exercise # 1, Page No.185, Q.68]

Ans. **[3]**

Sol. Central dogma model contains following steps :

DNA $\xrightarrow{\text{Transcription}}$ RNA $\xrightarrow{\text{Translation}}$ Protein

Q.83 The correct corresponding order of names of four aldoses with configuration given below :



respectively, is

(1) L-erythrose, L-threose, L-erythrose, D-threose

(2) D-threose, D-erythrose, L-threose, L-erythrose

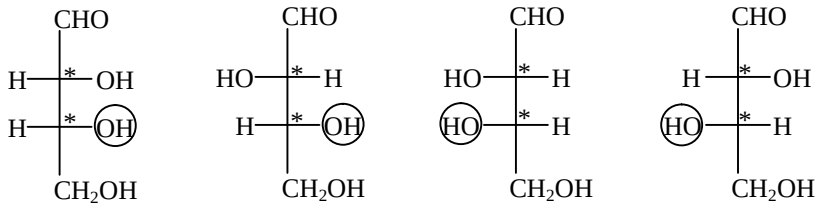
(3) L-erythrose, L-threose, L-erythrose, D-threose

(4) D-erythrose, D-threose, L-erythrose, L-threose

Students may find similar question in CP Class Notes :
[Chapter :Biomolecules]

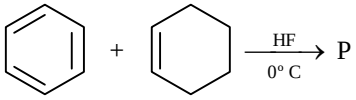
Ans. **[4]**

Sol.

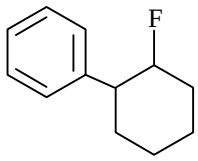


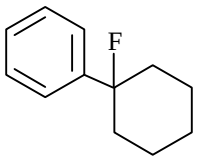
D-erythrose D-threose L-erythrose L-threose

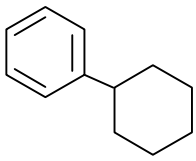
Q.84 In the given reaction

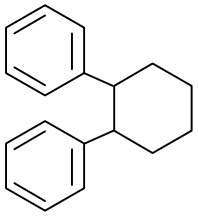


the product P is

(1) 

(2) 

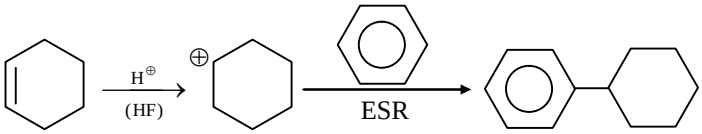
(3) 

(4) 

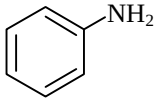
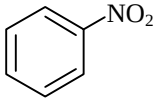
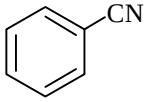
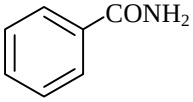
Students may find similar question in CP Class Notes :
[Chapter : GOC-II]

Ans. **[3]**

Sol.

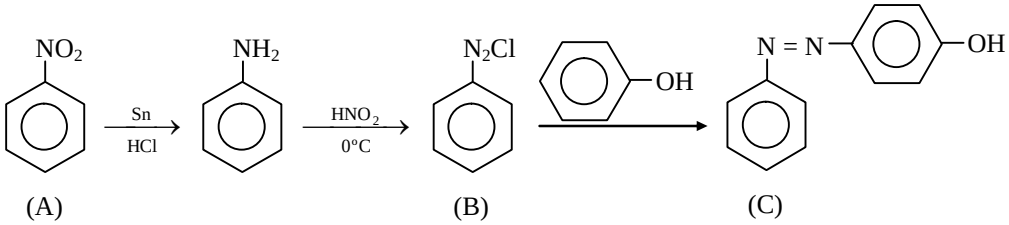


Q.85 A given nitrogen-containing aromatic compound A reacts with Sn/HCl, followed by HNO_2 to give an unstable compound B. B, on treatment with phenol, forms a beautiful coloured compound C with the molecular formula $C_{12}H_{10}N_2O$. The structure of compound A is

(1)  (2)  (3)  (4) 

Students may find similar question in CP Class Notes :
[Chapter : Nitrogen compounds]

Ans. **[2]**

Sol. 

(A) (B) (C)

Azo dye

[MF = $C_{12}H_{10}N_2O$]

Q.86 Consider the reaction

$CH_3CH_2CH_2Br + NaCN \rightarrow CH_3CH_2CH_2CN + NaBr$

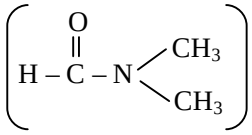
This reaction will be the fastest in

(1) ethanol (2) methanol

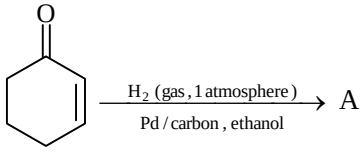
(3) N, N′ - dimethylformamide (DMF) (4) water

Students may find similar question in CP Class Notes :
[Chapter : Halogen Compounds]

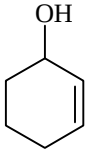
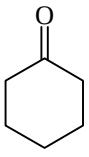
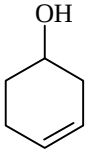
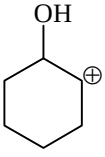
Ans. **[3]**

Sol. S_N2 favours by polar aprotic solvent like DMF. 

Q.87 The correct structure of the product A formed in the reaction



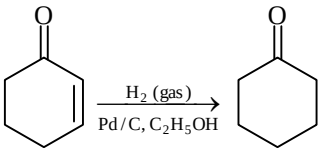
is

(1)  (2)  (3)  (4) 

Students may find similar question in CP Class Notes :
[Chapter : Carbonyl compounds]

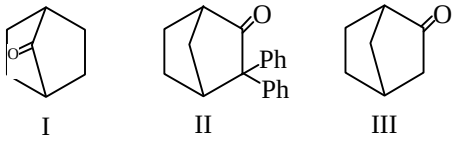
Ans. **[2]**

Sol.



α, β -unsaturated ketone is reduced into saturated ketone.

Q.88 Which among the given molecules can exhibit tautomerism?



I II III

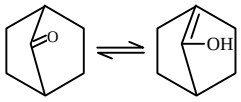
(1) III only (2) Both I and III (3) Both I and II (4) Both II and III

Students may find similar question in CP exercise sheet :
[Chapter : GOC-1 (Isomerism), Exercise # 6, Page No.68, Q.2]

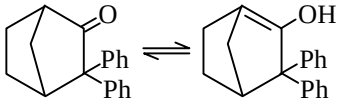
Ans. **[1]**

Sol.

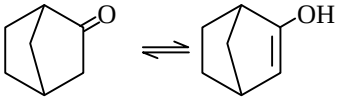
(I)



(II)



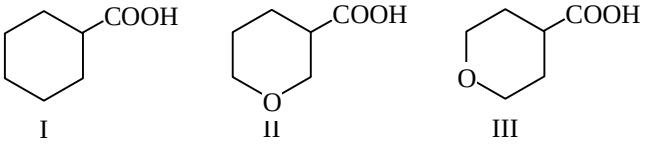
(III)



Enol does not exist according to Bredt's Rule.

$\therefore$ Only III can exhibit tantamerism.

Q.89 The correct order of strengths of the carboxylic acids



I II III

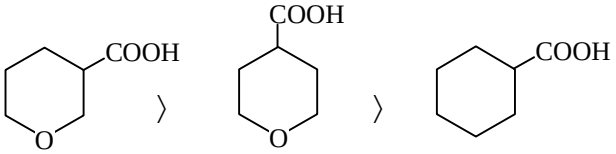
is

(1) I > II > III (2) II > III > I (3) III > II > I (4) II > I > III

Students may find similar concept question in CP exercise sheet :
[Chapter : GOC-II, Exercise # 1, Page No.105, Q. 2]

Ans. **[2]**

Sol. Acidic Nature (Ka) $\propto$ – I effect



(II) (III) (I)

Q.90 The compound that will react most readily with gaseous bromine has the formula

(1) C_3H_6 (2) C_2H_2 (3) C_4H_{10} (4) C_2H_4

Students may find similar concept question in CP exercise sheet :
[Chapter : Hydrocarbon, Exercise # 2, Page No.152, Q.10]

Ans. **[1]**

Sol. Propene is most reactive towards Br_2 (gaseous) than $CH_2=CH_2$, HC ≡ CH & butane due to most electron density.

Q.91 Which one of the following is **wrong** for fungi ?

(1) They are eukaryotic
(2) All fungi possess a purely cellulosic cell wall
(3) They are heterotrophic
(4) They are both unicellular and multicellular

Students may find it in CP Module :
[Chapter :Plant Diversity, Page No. 73]
NCERT Class XI, Page No. 22

Ans. **[2]**

Sol. Fungi mostly has chitin as cell wall.

Q.92 Methanogens belong to -

(1) Eubacteria (2) Archaebacteria (3) Dinoflagellates (4) Slime moulds

Students may find it in CP Module :
[Chapter :Plant Diversity, Page No. 24]
NCERT Class XI, Page No. 19

Ans. **[2]**

Sol. Methanogen is a form of archaebacteria.

Q.93 Select the **wrong** statement -

(1) The walls of diatoms are easily destructible

(2) 'Diatomaceous earth' is formed by the cell walls of diatoms

(3) Diatoms are chief producers in the oceans

(4) Diatoms are microscopic and float passively in water

Students may find it in CP Module :
[Chapter :Plant Diversity, Page No. 65]
NCERT Class XI, Page No. 20

Ans. **[1]**

Sol. Walls of diatoms are nearly indestructible and non-biodegradable.

Q.94 The label of a herbarium sheet **does not** carry information on -

(1) date of collection (2) name of collector

(3) local names (4) height of the plant

NCERT Class XI, Page No. 12

Ans. **[4]**

Sol. Label of herbarium sheet carry information about date and place of collection, local and botanical names, family and collector's name. Height of plant is not considered in herbarium sheet.

Q.95 Conifers are adapted to tolerate extreme environmental conditions because of -

(1) broad hardy leaves (2) superficial stomata

(3) thick cuticle (4) presence of vessels

Students may find it in CP Module :
[Chapter : Plant Diversity, Page No. 132]
NCERT Class XI, Page No. 38

Ans. **[3]**

Sol. Conifers (Gymnosperms) are adapted to tolerate extreme environmental condition because of thick cuticle, sunken stomata and needle like leaves.

Q.96 Which one of the following statements is **wrong** ?

(1) Algae increase the level of dissolved oxygen in the immediate environment

(2) Algin is obtained from red algae, and carrageenan from brown algae

(3) Agar-agar is obtained from *Gelidium* and *Gracilaria*

(4) *Laminaria* and *Sargassum* are used as food

Students may find it in CP Module :
[Chapter :Plant Diversity, Page No. 98]
NCERT Class XI, Page No. 33

Ans. **[2]**

Sol. Algin is obtained from brown algae and carrageenan from red algae

Q.97 The term 'polyadelphous' is related to -

(1) gynoecium (2) androecium (3) corolla (4) calyx

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 102]

Ans. **[2]**

Q.98 How many plants among Indigofera, Sesbania , Salvia, Allium, Aloe, mustard, groundnut, radish, gram and turnip have stamens with different lengths in their flowers ?

(1) Three (2) Four (3) Five (4) Six

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 103]

Ans. **[2]**

Q.99 Radial symmetry is found in the flowers of -

(1) *Brassica* (2) *Trifolium* (3) *Pisum* (4) *Cassia*

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 98]

Ans. **[1]**

Q.100 Free-central placentation is found in -

(1) *Dianthus* (2) *Argemone* (3) *Brassica* (4) *Citrus*

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 104]

Ans. **[1]**

Q.101 Cortex is the region found between -

(1) epidermis and stele (2) pericycle and endodermis
(3) endodermis and pith (4) endodermis and vascular bundle

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 26-27]

Ans. **[1]**

Q.102 The balloon-shaped structures called tyloses

(1) originate in the lumen of vessels
(2) characterize the sapwood
(3) are extensions of xylem parenchyma cells into vessels
(4) are linked to the ascent of sap through xylem vessels

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 37]

Ans. **[3]**

Q.103 A non-proteinaceous enzyme is -

(1) lysozyme (2) ribozyme

(3) ligase (4) deoxyribonuclease

Students may find similar question in CP exercise sheet : Plant Physiology
[Chapter Enzyme: , Exercise # 1, Q. 35]

Ans. **[2]**

Q.104 Select the **mismatch**.

(1) Gas vacuoles – Green bacteria (2) Large central vacuoles – Animal cells

(3) Protists – Eukaryotes (4) Methanogens –Prokaryotes

NCERT Class XI, Page No. 130

Ans. **[2]**

Sol. Large central vacuoles are present in plant cell and not in animal cell.

Q.105 Select the **wrong** statement-

(1) Bacterial cell wall is made up of peptidoglycan

(2) Pili and fimbriae are mainly involved in motility of bacterial cells

(3) Cyanobacteria lack flagellated cells.

(4) *Mycoplasma* is a wall-less microorganism

Students may find it in CP Module :
[Chapter :Plant Diversity, Page No. 29]
NCERT Class XI, Page No. 129

Ans. **[2]**

Sol. Pili and fimbriae do not help in motility

Sex pili - transfer of genetic material

Somatic pili or fimbriae - attachment to substratum or host.

Q.106 A cell organelle containing hydrolytic enzymes is -

(1) Lysosome (2) Microsome (3) Ribosome (4) Mesosome

Students may find it in CP Module :
[Chapter : Cell Biology, Page No. 26]

Ans. **[1]**

Q.107 During cell growth, DNA synthesis takes place in -

(1) S phase (2) G_1 phase (3) G_2 phase (4) M phase

Students may find it in CP Module :
[Chapter : Cell Biology, Page No. 48]

Ans. **[1]**

Q.108 Which of the following biomolecules is common to respiration-mediated breakdown of fats, carbohydrates and proteins ?

(1) Glucose-6-phosphate (2) Fructose 1, 6-bisphosphate

(3) Pyruvic acid (4) Acetyl CoA

Students may find similar question in CP exercise sheet : Plant Physiology
[Chapter- Cell respiration : , Exercise # 1, Q. 242]

Ans. **[3]**

Sol. Pyruvic acid is the first formed common intermediate between cell carbohydrate, fat & protein metabolism.

Q.109 A few drops of sap were collected by cutting across a plant stem by a suitable method. The sap was tested chemically. Which one of the following test results indicates that it is phloem sap ?

(1) Acidic (2) Alkaline

(3) Low refractive index (4) Absence of sugar

Ans. **[2]**

Sol. Sucrose solution is alkaline in nature.

Q.110 You are given a tissue with its potential for differentiation in an artificial culture. Which of the following pairs of hormones would you add to the medium to secure shoots as well as roots ?

(1) IAA and gibberellin (2) Auxin and cytokinin

(3) Auxin and abscisic acid (4) Gibberellin and abscisic acid

Students may find similar question in CP exercise sheet : Plant Physiology
[Chapter : Plant Growth Physiology, Exercise # 1, Q.35]

Ans. **[2]**

Sol. Auxin and cytokinin are used to induce root and shoot formation respectively in culture medium

Q.111 Phytochrome is a -

(1) Flavoprotein (2) Glycoprotein

(3) Lipoprotein (4) Chromoprotein

Students may find similar question in CP exercise sheet : Plant Physiology
[Chapter : Plant Growth Physiology, Q.138]

Ans. **[4]**

Sol. Phytochromes are structurally similar to phycobilins which are chromoproteins.

Q.112 Which is essential for the growth of root tip ?

(1) Zn (2) Fe (3) Ca (4) Mn

Students may find it in CP Module : Plant Physiology
[Chapter : Mineral Nutrition , Page No. 215]

Ans. **[3]**

Sol. Ca is required for activity of meristemetic cells.

Q.113 The process which makes major difference between C_3 and C_4 plants is -

(1) Glycolysis (2) Calvin cycle (3) Photorespiration (4) Respiration

Students may find similar question in CP exercise sheet : Plant Physiology
[Chapter : Photosynthesis , Exercise # 01, Q. 308]

Ans. **[3]**

Sol. Photorespiration absent in C_4 plants

Q.114 Which one of the following statements is **not** correct ?

(1) Offspring produced by the asexual reproduction are called clone

(2) Microscopic, motile asexual reproductive structures are called zoospores

(3) In potato, banana and ginger, the plantlets arise from the internodes present in the modified stem

(4) Water hyacinth, growing in the standing water, drains oxygen from water that leads to the death of fishes

Ans. **[3]**

Sol. Potato, banana & ginger have modified underground stems on the onset of favourable conditions, aerial shoot arises from axillary buds present on condensed modified stem.

Q.115 Which one of the following generates new genetic combinations leading to variation ?

(1) Vegetative reproduction (2) Parthenogenesis

(3) Sexual reproduction (4) Nucellar polyembryony

Students may find it in CP Module :
[Chapter : Genetics , Page No. 02]

Ans. **[3]**

Q.116 Match **Column-I** with **Column-II** and select the correct option using the codes given below –

	Column-I		**Column-II**
(a)	Pistils fused together	(i)	Gametogenesis
(b)	Formation of gametes	(ii)	Pistillate
(c)	Hyphae of higher Ascomycetes	(iii)	Syncarpous
(d)	Unisexual female flower	(iv)	Dikaryotic

Codes :

	a	**b**	**c**	**d**
(1)	iv	iii	i	ii
(2)	ii	i	iv	iii
(3)	i	ii	iv	iii
(4)	iii	i	iv	ii

Students may find it in CP Module :
[Chapter : Structural Organisation in Plants, Page No. 103]

Ans. **[4]**

Q.117 In majority of angiosperms -
(1) egg has a filiform apparatus
(2) there are numerous antipodal cells
(3) reduction division occurs in the megaspore mother cells
(4) a small central cell is present in the embryo sac

Students may find it in CP Module :
[*Chapter : Reproduction in flowering plants, Page No.19*]

Ans. **[3]**

Sol. Meiosis occur in spore mother cells in angiosperms.

Q.118 Pollination in water hyacinth and water lily is brought about by the agency of -
(1) water (2) insects or wind (3) birds (4) bats

Students may find it in CP Module :
[*Chapter : Reproduction in flowering plants, Page No.27*]

Ans. **[2]**

Sol. Pollination in water hyacinth & water lily are brought about by both wind & insects

Q.119 The ovule of an angiosperm is technically equivalent to -
(1) megasporangium (2) megasporophyll (3) megaspore mother cell (4) megaspore

Students may find similar question in CP exercise sheet :
[*Chapter : Reproduction in flowering plants, Exercise # 2, Q. 148*]

Ans. **[1]**

Sol. Megasporangium is equivalent to ovule.

Q.120 Taylor conducted the experiments to prove semiconservative mode of chromosome replication on
(1) *Vinca rosea* (2) *Vicia faba*
(3) *Drosophila melanogaster* (4) *E. coli*

Students may find it in CP Module :
[*Chapter : Protoplasm, Page No.123*]

Ans. **[2]**

Q.121 The mechanism that causes a gene to move from one linkage group to another is called -
(1) inversion (2) duplication (3) translocation (4) crossing-over

Students may find it in CP Module :
[*Chapter : Genetics, Page No 18*]

Ans. **[3]**

Q.122 The equivalent of a structural gene is -
(1) muton (2) cistron (3) operon (4) recon

Students may find it in CP Class Notes :
[*Chapter : Protoplasm*]

Ans. **[2]**

Q.123 A true breeding plant is -

(1) one that is able to breed on its own

(2) produced due to cross-pollination among unrelated plants

(3) near homozygous and produces offspring of its own kind

(4) always homozygous recessive in its genetic constitution

Students may find it in CP Class Notes :
[*Chapter : Genetics*]

Ans. **[3]**

Q.124 Which of the following rRNAs acts as structural RNA as well as ribozyme in bacteria ?

(1) 5 S rRNA (2)18 S rRNA (3) 23 S rRNA (4) 5.8 S rRNA

Students may find it in CP Module :
[*Chapter : Cell Biology, Page No. 129*]

Ans. **[3]**

Sol. Larger ribosomal subunit consist of ribozyme

i.e. Prokaryotes $\rightarrow$ 23 S rRNA

Eukaryotes $\rightarrow$ 28 S rRNA

Q.125 Stirred-tank bioreactors have been designed for -

(1) purification of product

(2) addition of preservatives to the product

(3) availability of oxygen throughout the process

(4) ensuring anaerobic conditions in the culture vessel

Students may find it in CP Module :
[*Chapter : Biotechnology , Page No.108*]

Ans. **[3]**

Q.126 A foreign DNA and plasmid cut by the same restriction endonuclease can be joined to form a recombinant plasmid using

(1) *Eco* RI (2) Taq polymerase (3) Polymerase III (4) Ligase

Students may find it in CP Module :
[*Chapter : Biotechnology, Page No.94*]

Ans. **[4]**

Q.127 Which of the following is **not** a component of downstream processing ?

(1) Separation (2) Purification (3) Preservation (4) Expression

Students may find it in CP Module :
[*Chapter : Biotechnology, Page No.94*]

Ans. **[4]**

Q.128 Which of the following restriction enzymes produces blunt ends ?

(1) *Sal* I (2) *Eco* RV (3) *Xho* I (4) *Hind* III

Ans. **[2]**

Sol. Recognisation and cutting site for *Eco* RV GAT↓ATC

CTA↑TAG

Q.129 Which kind of therapy was given in 1990 to a four-year-old girl with adenosine deaminase [ADA] deficiency ?

(1) Gene therapy (2) Chemotherapy (3) Immunotherapy (4) Radiation therapy

Students may find it in CP Module :
[Chapter : Biotechnology, Page No.102]

Ans. **[1]**

Q.130 How many hot spots of biodiversity in the world have been identified till date by Norman Myers ?

(1) 17 (2) 25 (3) 34 (4) 43

Students may find it in CP Module : Ecology
[Chapter : Biodiversity, Page No.147]

Ans. **[3]**

Sol. Biodiversity hot spots in world

Q.131 The primary producers of the deep-sea hydrothermal vent ecosystem are

(1) green algae (2) chemosynthetic bacteria (3) blue-green algae (4) coral reefs

Students may find it in CP Module : Ecology
[Chapter : Organism & Environment, Page No.12]

Ans. **[2]**

Sol. In deep hydrothermal vents chemosynthetic bacteria are present as there is no light energy available there

Q.132 Which of the following is **correct** for *r*-selected species ?

(1) Large number of progeny with small size (2) Large number of progeny with large size

(3) Small number of progeny with small size (4) Small number of progeny with large size

Students may find it in CP Module : Ecology
[Chapter : Population & Community, Page No.52]

Ans. **[1]**

Sol. r-stratogists produce large number of offsprings of small size.

Q.133 If '+' sign is assigned to beneficial interaction, '–' sign to detrimental and '0' sign to neutral interaction, then the population interaction represented by '+' '–' refers to

(1) mutualism (2) amensalism (3) commensalism (4) parasitism

Students may find it in CP Module : Ecology
[Chapter : Population & Community, Page No.65]

Ans. **[4]**

Q.134 Which of the following is **correctly** matched ?

(1) Aerenchyma-*Opuntia* (2) Age pyramid-Biome

(3) *Parthenium hysterophorus*-Threat to biodiversity (4) Stratification-Population

Students may find similar question in CP exercise sheet : Ecology
[Chapter : Biodiversity, Exercise # 01, Page No.157, Q.18]

Ans. **[3]**

Q.135 Red List contains data or information on

(1) all economically important plants (2) plants whose products are in international trade

(3) threatened species (4) marine vertebrates only

Students may find similar question in CP exercise sheet : Ecology
[Chapter : Biodiversity, Page No.63, Q.20]

Ans. **[3]**

Sol. Red data book contains list of threatened species

Q.136 Which of the following sets of diseases is caused by bacteria ?

(1) Cholera and tetanus (2) Typhoid and smallpox

(3) Tetanus and mumps (4) Herpes and influenza

Students may find it in CP Module :
[Chapter : Immunity and Disease, Page No.135]

Ans. **[1]**

Sol. Cholera – Vibrio cholerae

Tetanus – Clostridium tetani

Q.137 Match **Column-I** with **Column-II** for housefly classification and select the correct option using the codes given below :

Column-I	**Column-II**
a. Family	(i) Diptera
b. Order	(ii) Arthropoda
c. Class	(iii) Muscidae
d. Phylum	(iv) Insecta

Codes :

	a	b	c	d
(1)	(iii)	(i)	(iv)	(ii)
(2)	(iii)	(ii)	(iv)	(i)
(3)	(iv)	(iii)	(ii)	(i)
(4)	(iv)	(ii)	(i)	(iii)

NCERT Class XI, Page No. 11

Ans. **[1]**

Sol. Following is the correct systemic position of housefly musca domestica

Phylum – Arthropoda
Class – Insecta
Order – Diptera
Family – Muscidae
Genus – Musca
Species – domestica

Q.138 Choose the correct statement.

(1) All mammals are viviparous

(2) All cyclostomes do not possess jaws and paired fins.

(3) All reptiles have a three-chambered heart.

(4) All pisces have gills covered by an operculum.

Students may find it in CP Module :

[*Chapter : Animal Diversity, Page No.104*]

Ans. **[2]**

Sol. Animals belonging to class cyclostomata are marine vertebrates without jaws & paired fins.

Example : Petromyzone & Myxine

Q.139 Study the four statement (A-D) given below and select the two correct ones out of them :

(A) Definition of biological species was given by Ernst Mayr.

(B) Photoperiod does not affect reproduction in plants.

(C) Binomial nomenclature system was given by R.H. Whittaker.

(D) In unicellular organisms, reproduction is synonymous with growth.

The two correct statements are

(1) B and C (2) C and D (3) A and D (4) A and B

Students may find it in CP Module :

[*Chapter :Plant Diversity, Page No. 8*]

NCERT Class XI, Page No. 4, 6 & 251

Ans. **[3]**

Sol. Photoperiod affects reproduction in plants and decides LDP, SDP or day neutral plants.

Binomial nomenclature system was proposed by Gaspard Baulin and established by Linnaeus.

Q.140 In male cockroaches, sperms are stored in which part of the reproductive system ?

(1) Seminal vesicles (2) Mushroom glands (3) Tester (4) Vas deferens

Students may find it in CP Module :

[*Chapter : Lower animals, Page No.97*]

Ans. **[1]**

Sol. In male cockroach sperms are stored in seminal vesicle after their release from testis.

Q.141 Smooth muscles are

(1) involuntary, fusiform, non-striated

(2) voluntary, multinucleate, cylindrical

(3) involuntary, cylindrical, striated

(4) voluntary, spindle-shaped, uninucleate

Ans. **[1]**

Sol. Smooth muscles are fusiform or spindle shaped non-striated in structure and involuntary in function. Because of myofilaments are found in diffused or scattered form, regulated by autonomic nervous system.

Q.142 Oxidative phosphorylation is

(1) formation of ATP by transfer of phosphate group from a substrate to ADP

(2) oxidation of phosphate group in ATP

(3) addition of phosphate group to ATP

(4) formation of ATP by energy released from electrons removed during substrate oxidation

Students may find it in CP Module : Plant physiology
[Chapter : Cell Respiration, Page No.78]

Ans. **[4]**

Sol. Oxidative phosphorylation leads to synthesis of ATP by the use of energy obtained by oxidation of substrate

Q.143 Which of the following is the least likely to be involved in stabilizing the three—dimensional folding of most proteins ?

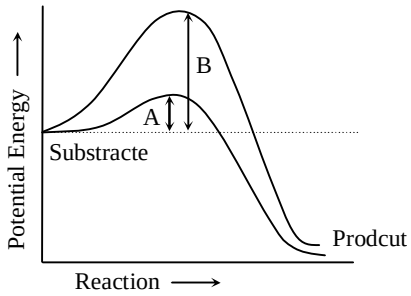
(1) hydrogen bonds (2) Electrostatic interaction

(3) Hydrophobic interaction (4) Easter bonds

Students may find it in CP Module :
[Chapter : Protoplasm, Page No. 113]

Ans. **[4]**

Q.144 Which of the following describes the given graph correctly ?



(1) Endothermic reaction with energy A in presence of enzyme and B in absence of enzyme

(2) Exothermic reaction with energy A in presence of enzyme and B in absence of enzyme

(3) Endothermic reaction with energy A in absence of enzyme and B in presence of enzyme

(4) Exothermic reaction with energy A in absence of enzyme and B in presence of enzyme

Students may find it in CP Module : Plant physiology
[Chapter : Enzymes, Page No. 117]

Ans. **[2]**

Sol. Enzymetic/biochemical reactions indicated are exothermic. In presence of enzyme activation energy is low. While in absence of enzyme activation energy is high.

Q.145 When cell has stalled DNA replication fork, which checkpoint should be predominantly activated ?

(1) G_1/S (2) G_2/M (3) M (4) Both G_2/M and M

Students may find it in CP Module :
[Chapter : Cell Division, Page No. 49]

Ans. **[2]**

Q.146 Match the stages of meiosis in Column-I to their characteristic features in Column-II and select the correct option using the codes given below :

Column – I	**Column – II**
(a) Pachytene	(i) Pairing of homologous chromosomes
(b) Metaphase I	(ii) Terminalization of chaismata
(c) Diakinesis	(iii) Crossing-over takes place
(d) Zygotene	(iv) Chromosomes aligri at equatorial plate

Codes :

	a	**b**	**c**	**d**
(1)	(iii)	(iv)	(ii)	(i)
(2)	(i)	(iv)	(ii)	(iii)
(3)	(ii)	(iv)	(iii)	(i)
(4)	(iv)	(iii)	(ii)	(i)

Students may find it in CP Module :
[*Chapter : Cell Division, Page No. 54*]

Ans. **[1]**

Sol. Question From CP Module [Cell Division] theory on p.no. 54

Q.147 Which hormones do stimulate the production of pancreatic juice and bicarbonate ?

(1) Angiotensin and epinephrine
(2) Gastrin and insulin
(3) Cholecystokinin and secretin
(4) Insulin and glucagon

Students may find it in CP Module :
[*Chapter : Digestive System, Page No. 148*]

Ans. **[3]**

Sol. Cholecystokinin and secretin hormones are stimulates. The enterocyte of intestine and pancrease.

Q.148 The partial pressure of oxygen in the alveoli of the lungs is -

(1) equal to that in the blood
(2) more than that in the blood
(3) less than that in the blood
(4) less than that of carbon dioxide

Students may find it in CP Module :
[*Chapter : Respiratory System, Page No. 52*
NCERT XI, Page No. 272]

Ans. **[2]**

Sol. The partial pressure of oxygen in alveoli of lumgs is less than that in blood.
Normal PO_2 in alhcoli is 104 mmttg
& PO_2 in oxygenated blood is 95 mm Hg

Q.149 Choose the correct statement.

(1) Nociceptors respond to change in pressure.

(2) Meissner's corpuscles are thermoreceptors.

(3) Photoreceptors in the human eye are depolarized during darkness and become hyperpolarized in response to the light stimulus.

(4) Receptors do not produce graded potentials.

Students may find it in CP Module :
[Chapter : Sensory System, Page No. 255]

Ans. **[3]**

Sol. Shining light on a photoreceptor, either a rod sell or a cone, leads to membrane hyperpolarization rather than depolarization. In the dark the receptor is in a depolarized state, with membrane potential of roughly – 40 mv. Progressive increases in the intensity of illumination cause the potential across the receptor membrane to become more negative (reaches about – 65 mv.)

Q.150 Graves' disease is caused due to

(1) hyposecretion of thyroid gland (2) hypersecretion of thyroid gland

(3) hyposecretion of adrenal gland (4) hypersecretion of adrenal gland

Students may find it in CP Module :
[Chapter : Endocrine System, Page No. 139]

Ans. **[2]**

Sol. Grave's disease is caused by hypersection of thyeoxine.

Q.151 Name the ion responsible for unmasking of active sites for myosin for cross-bridge activity during muscle contraction.

(1) Calcium (2) Magnesium (3) Sodium (4) Potassium

Students may find it in CP Module :
[Chapter : Muscles System , Page No. 198]
NCERT XI-Eng-Page No.307

Ans. **[1]**

Sol. During muscle contraction neural signal reaching. Neuromuscular junction release ach which generate action potential in the sarcolemma and cause the release of Ca^{+2} into sarcoplasm.

Q.152 Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body.

(1) Erythrocytes (2) Leucocytes (3) Neutrophils (4) Thrombocytes

Students may find it in CP Module :
[Chapter : Animal Tissue, Page No. 39]

Ans. **[4]**

Sol. Thrombocytes are decreases in no. in clothing disorder, leading to excessive loss of blood from the body.

Q.153 Name a peptide hormone which acts mainly on hepatocytes, adiposites and enhances cellular glucose uptake and utilization.

(1) Insulin (2) Glucagon (3) Secretin (4) Gastrin

Students may find it in CP Module :
[Chapter : Endocrine System, Page No. 150]

Ans. **[1]**

Sol. Functional human insulin is peptide hormone which is made up of 51 Amino Acid. Insulin stimulates the permeability and uptake of Glucose in hepatic cells.

Q.154 Osteoporosis, an age-related disease of skeletal system, may occur due to

(1) immune disorder affecting neuromuscular junction leading to fatigue

(2) high concentration of Ca^{++} and Na^{+}

(3) decreased level of estrogen

(4) accumulation of uric acid leading to inflammation of joints

Students may find it in CP Module :
[Chapter : Endocrine System, Page No. 154]

Ans. **[3]**

Sol. Osteoporosis, is an age related disorder / disease and it is more common in elder female. Because of after menopause secretion of estrogen is stope from ovary.

Q.155 Serum differs from blood in

(1) lacking globulins (2) lacking albumins

(3) lacking clotting factors (4) lacking antibodies

Students may find it in CP Module :
[Chapter : Animal Tissue, Page No. 39]

Ans. **[3]**

Sol. At the time of clotting of blood, blood clotting factors are used in clotting process while after clotting remaining plasma oozes out is called as serum.

Q.156 Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because

(1) there is a negative pressure in the lungs

(2) there is a negative intrapleural pressure pulling at the lung walls

(3) there is a positive intrapleural pressure

(4) pressure in the lungs is higher than the atmospheric pressure

Students may find it in CP Module :
[Chapter : Animal Physiology-,Page No. 49]

Ans. **[2]**

Sol. Lungs do not collapse between breathes some air always remains in the lungs which can never be expelled because there is negative intrapleural pressure pulling at the lung wall.

Q.157 The posterior pituitary gland is not a 'true' endocrine gland because

(1) it is provided with a duct

(2) it only stores and releases hormones

(3) it is under the regulation of hypothalamus

(4) is secretes enzymes

Students may find it in CP Module :
[Chapter : Endocrine System, Page No. 133]

Ans. **[2]**

Sol. Posterior pituitary do not synthesize any type of hormone. This lobe only storage and releases the hormone of hypothalamus like ADH and oxytocin.

Q.158 The part of nephron involved in active reabsorption of sodium is
(1) distal convoluted tubule
(2) proximal convoluted tubule
(3) Bowman's capsule
(4) descending limb of Henle's loop

Students may find it in CP Module :
[Chapter : Excretory System , Page No. 16 & 21]

Ans. **[1, 2]**

Q.159 Which of the following is hormone releasing IUD ?
(1) LNG-20 (2) Multiload 375 (3) Lippes loop (4) Cu7

Students may find it in CP Module :
[Chapter : Reproductive System, Page No. 89]
NCERT Class XII, Page No. 60

Ans. **[1]**

Sol. LNG – 20 (Leuonorgesterol – 20 mg) is a hormore releasings intra uterine device which is used as contraceptive.

Q.160 Which of the following is incorrect regarding vasectomy ?
(1) No sperm occurs in seminal fluid
(2) No sperm occurs in epididymis
(3) Vasa deferentia is cut and tied
(4) Irreversible sterility

Students may find it in CP Module :
[Chapter : Reproductive System, Page No. 89,]
NCERT Page 61

Ans. **[2]**

Sol. Following vasectomy (when vas defernnse are act) sperm will be formed in testis but they cant more out of reproductive tract for fertilization. The statement that no sperm occurs in epididymis in wrong.

Q.161 Embryo with more than 16 blastgomeres formed due to in vitro fertilization is transferred into
(1) uterus (2) fallopian tube (3) fimbriae (4) cervix

Students may find it in CP Module :
[Chapter : Reproductive System , Page No. 92]
NCERT Page No. 64

Ans. **[1]**

Sol. Embryos with more than 16 blastomeres formed due to in vitro fertilization is transferred into uterus for implantation.

Q.162 Which of the following depicts the correct pathway of transport of sperms ?
(1) Rete testis → Efferent ductules → Epididymis → Vas deferens
(2) Rete testis → Epididymis → Efferent ductules → Vas deferens
(3) Rete testis → Vas deferens → Efferent ductules → Epididymis
(4) Efferent ductules → Rete testis → Vas deferens → Epididymis

Ans. **[1]**

Sol. Sperms are transported out of testis from following route –
Rete testrs → Efferent ductules (vasa efferentia) → epididymis → vas deferens.

Q.163 Match Column – I with Column – II and select the correct option using the codes given below :

	Column – I		**Column – II**
(a)	Mons pubis	(i)	Embryo formation
(b)	Antrum	(ii)	Sperm
(c)	Trophectoderm	(iii)	Female external genitalia
(d)	Nebenkern	(iv)	Graafian follicle

Codes :

	a	**b**	**c**	**d**
(1)	(iii)	(iv)	(ii)	(i)
(2)	(iii)	(iv)	(i)	(ii)
(3)	(iii)	(i)	(iv)	(ii)
(4)	(i)	(iv)	(iii)	(ii)

Students may find it in CP Module :
[Chapter : Embrology, Page No.41]
NCERT Page No.45

Ans. **[1]**

Sol.

Mons pubis	-	Female external genitalia
Antrum	-	Graafian follicle
Trophectoderm	-	Embryo formation
Nebenkern	-	Sperm

Q.164 Several hormones like hCG, hPL, estrogen, progesterone are produced by

(1) ovary (2) placenta (3) fallopian tube (4) pituitary

Students may find it in CP Module :
[Chapter : Endocrine System, Page No.155]

Ans. **[2]**

Sol. All hormones are secreted by placenta

Q.165 If a colour-blind man marries a woman who is homozygous for normal colour vision, the probability of their son being colour-blind is

(1) 0 (2) 0.5 (3) 0.75 (4) 1

Students may find it in CP Module :
[Chapter : Genetics, Page No. 20]

Ans. **[1]**

Sol.

	X^c	Y
X	X^cY	XY
X	X^cX	XY

Probability of their sun for colour blindness = 0%

Q.166 Genetic drift operates in

(1) small isolated population (2) large isolated population

(3) non-reproductive population (4) slow reproductive population

Ans. **[1]**

Sol. Genedrift applicable only small isolated population.

Q.167 In Hardy-Weinberg equation, the frequency of heterozygous individual is represented by

(1) p^2 (2) 2pq (3) pq (4) q^2

Students may find it in CP Module :

[*Chapter : Genetic, Page No. 50*]

Ans. **[2]**

Sol. 2pq – Represent

Q.168 The chronological order of human evolution from early to the recent is

(1) Australopithecus → Ramapithecus → Homo habilis → Homo erectus

(2) Ramapithecus → Australopithecus → Homo habilis → Homo erectus

(3) Ramapithecus → Homo habilis → Australopithecus → Homo erectus

(4) Australopithecus → Homo habilis → Ramapithecus → Homo erectus

Students may find it in CP Module :

[*Chapter : Origin and Evolution , Page No. 42*]

NCERT Page No. 140-141

Ans. **[2]**

Sol. Ramapithecus → Australopithecus → Homo habilis → Homo erectus

Q.169 Which of the following is the correct sequence of events in the origin of life ?

I. Formation of protobionts
II. Synthesis of organic monomers
III. Synthesis of organic polymers
IV. Formation of DNA-based genetic systems

(1) I, II, III, IV (2) I, III, II, IV (3) II, III, I, IV (4) II, III, IV, I

Ans. **[3]**

Sol. II. Synthesis of organic monomers
III. Synthesis of organic polymers
I. Synthesis of protobionts
IV. Formation of DNA-based genetic systems

Q.170 A molecule that can act as a genetic material must fulfill the traits given below, except

(1) it should be able to express itself in the form of 'Mendelian characters'
(2) it should be able to generate its replica
(3) it should be unstable structurally and chemically
(4) it should provide the scope for slow changes that are required for evolution

Students may find it in CP Notes :
[Chapter : Protoplasm]
NCERT-XII, Page NO. 103

Ans. **[3]**

Q.171 DNA-dependent RNA polymerase catalyzes transcription on one strand of the DNA which is called the

(1) template strand (2) coding strand (3) alpha strand (4) antistrand

Ans. **[1]**

Q.172 Interspecific hybridization is the mating of

(1) animals within same breed without having common ancestors
(2) two different related species
(3) superior males and females of different breeds
(4) more closely related individuals within same breed for 4-6 generations

Students may find it in CP Module :
[Chapter : Economic Zoology , Page No. 82]
NCERT Page No. 168

Ans. **[2]**

Sol. Interspecific hybridization $\rightarrow$ breeding b/w two different species

Q.173 Which of the following is correct regarding AIDS causative agent HIV ?

(1) HIV is enveloped virus containing one molecule of single-stranded RNA and one molecule of reverse transcriptase.
(2) HIV is enveloped virus that containing two identical molecule of single-stranded RNA and two molecule of reverse transcriptase.
(3) HIV is unenveloped retrovirus.
(4) HIV does not escape but attacks the acquired immune response

Ans. **[2]**

Q.174 Among the following edible fishes, which one is a marine fish having rich source of omeg-3 fatty acids ?
(1) Mystus (2) Mangur (3) Mrigala (4) Mackerel

Ans. **[4]**

Q.175 Match Column-I with Column-II and select the correct option using the codes given below :

	Column – I		**Column – II**
(a)	Citric acid	(i)	Trichoderma
(b)	Cyclosporin A	(ii)	Clostridium
(c)	Statins	(iii)	Aspergillus
(d)	Butyric acid	(iv)	Monascus

Codes :

	a	**b**	**c**	**d**
(1)	(iii)	(i)	(ii)	(iv)
(2)	(iii)	(i)	(iv)	(ii)
(3)	(i)	(iv)	(ii)	(iii)
(4)	(iii)	(iv)	(i)	(ii)

NCERT–XII Page No. 183

Ans. **[2]**

Q.176 Biochemical Oxygen Demand (BOD) may not be a good index for pollution for water bodies receiving effluents from
(1) domestic sewage (2) dairy industry (3) petroleum industry (4) sugar industry

Students may find it in CP Module : Ecology
[Chapter : Environmental issues , Page No. 179]

Ans. **[3]**

Sol. Petroleum industry release inorganic chemical pollutants which can not be oxidized by microbes bionomically. So not be oxidized by microbes biochemical. So not indicates BOD.

Q.177 The principle of competitive exclusion was stated by
(1) C. Darwin (2) G. F. Gause (3) MacArthur (4) Verhulst & Pearl

Students may find it in CP Module : Ecology
[Chapter : Population & Community, Page No. 65]

Ans. **[2]**

Sol. Principle of competitive exclusion wos given by G.F. Gause.

Q.178 Which of the following National Parks is home to the famous musk deer or hangul ?
(1) Keibul Lamjao National Park, Manipur
(2) Bandhavgarh National Park, Madhya Pradesh
(3) Eaglenest Wildlife Sanctuary, Arunachal Pradesh
(4) Dachigam National Park, Jammu & Kashmir

Students may find it in CP Module : Ecology
[Chapter : Biodiversity , Page No. 154]

Ans. **[4]**

Sol. Dachigam National Park, J & K is known for conferucetion of musk deer | thangut

Q.179 A lake which is rich in organic waste may result in

(1) increased population of aquatic organisms due to minerals

(2) drying of the lake due to algal bloom

(3) increased population of fish due to lots of nutrients

(4) mortality of fish due to lack of oxygen

Students may find it in CP Module : Ecology

[Chapter : Environmental issues , Page No. 179]

Ans. **[4]**

Sol. A lake rich in organic waste leuds to decrease in Dissolved oxygen (D.O) in create in biochemical oxygen demand (BoD) which leads to deatn of fishes.

Q.180 The highest DDT concentration in aquatic food chain shall occur in

(1) Phytoplankton (2) seagull (3) crab (4) eel

Students may find it in CP Module : Ecology

[Chapter : Environmental issues , Page No. 202]

Ans. **[2]**

Sol. Seagull is a fish eating bird which is a tertiary consumer in given all options so have highest conc. of DDT

Phytoplankton $\rightarrow$ Crab $\rightarrow$ Eel $\rightarrow$ Seagull