Question no. 1

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A S.H.M. has amplitude 'a' and time period T. The maximum velocity will be

(1) $\frac{4a}{T}$

(2) $\frac{2a}{T}$

(3) $2\pi\sqrt{\frac{a}{T}}$

(4) $\frac{2\pi a}{T}$

$V_{max} = A\omega$

$V_{max} = a \times \frac{2\pi}{T}$

Question no. 2

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A particle is vibrating in a simple harmonic motion with an amplitude of 4 cm. At what displacement from the equilibrium position, is its energy half potential and half kinetic.

(1) 1 cm (2) $\sqrt{2}$ cm

(3) 3 cm (4) $2\sqrt{2}$ cm

$x = \pm \frac{A}{\sqrt{2}} \rightarrow U = K$

$x = \frac{A}{\sqrt{2}} = \frac{4\,cm}{\sqrt{2}} = 2\sqrt{2}\,cm$

Question no. 3

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A particle starts simple harmonic motion from the mean position. Its amplitude is a and total energy E. At one instant its kinetic energy is 3E/4. Its displacement at that instant is

(1) $\frac{a}{\sqrt{2}}$ (2) a/2

(3) $\frac{a}{\sqrt{3/2}}$ (4) $a/\sqrt{3}$

$E = K + U$

$K = \frac{3}{4} \times E$

$E = \frac{3E}{4} + U$

$U = \frac{E}{4} \rightarrow \frac{kx^2}{2}$

$x = ?$

$x^2 = \frac{a^2}{4}$

$x = \frac{a}{2}$

$\frac{1}{4} \times \frac{kA^2}{2} = \frac{kx^2}{2}$

Question no. 4

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Equation of a particle executing SHM is $\frac{2d^2x}{dt^2} + 32x = 0$, then the time period of the body particle is

(1) Zero (2) π

(3) 2π (4) $\frac{\pi}{2}$

$T = ?$

$\frac{d^2x}{dt^2} + 16x = 0$

$\omega^2 = 16$

$\omega = 4$

$\frac{2\pi}{T} = 4$

$\frac{d^2x}{dt^2} + \omega^2 x = 0$

$T = \frac{\pi}{2}$

Question no. 5

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A particle is subjected to two SHMs. $x_1 = A_1 \sin\omega t$ and $x_2 = A_2 \sin\left(\omega t + \frac{\pi}{4}\right)$. The resultant SHM will have an amplitude of

(1) $\frac{A_1 + A_2}{2}$

(2) $\sqrt{A_1^2 + A_2^2}$

(3) $\sqrt{A_1^2 + A_2^2 + \sqrt{2}A_1A_2}$

(4) A_1A_2

Question no. 6

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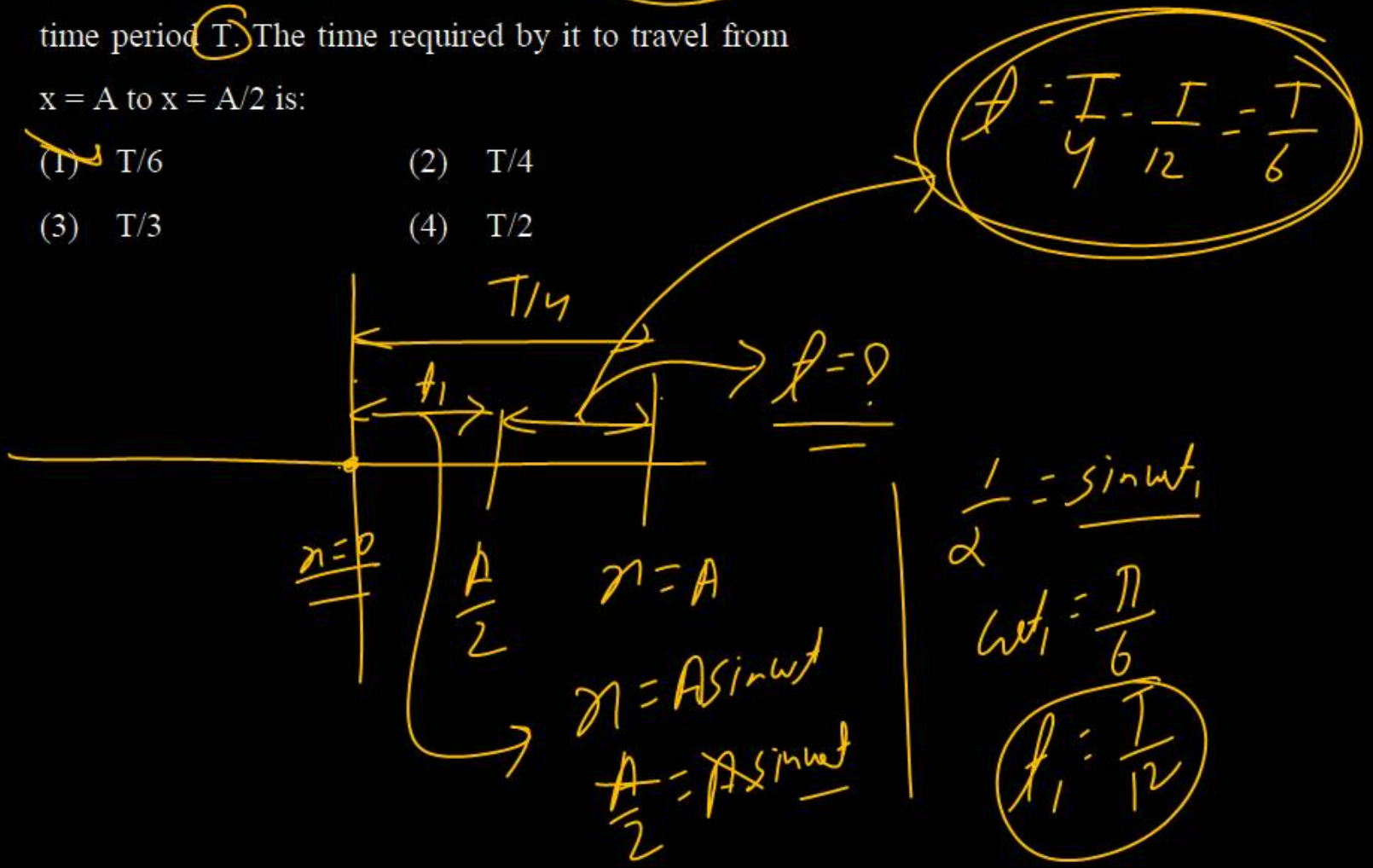
A simple harmonic motion has an amplitude A and time period T. The time required by it to travel from x = A to x = A/2 is:

(1) T/6 (2) T/4

(3) T/3 (4) T/2



Question no. 7

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The displacement of a particle is represented by the equation $y = 3\cos\left(\frac{\pi}{4} - 2\omega t\right)$. The motion of the particle is

(1) Simple harmonic with period $2\pi/\omega$

(2) Simple harmonic with period π/ω

(3) Periodic but not simple harmonic

(4) Non – periodic

$y = A\sin(\omega t + \phi)$

$\omega_1 = 2\omega$

$\frac{2\pi}{T_1} = 2\omega$

$T_1 = \frac{\pi}{\omega}$

Question no. 8

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Particle is executing SHM along a straight line. Its velocities at distances x_1 and x_2 from the mean position are V_1 and V_2 respectively. Its time period is:–

(1) $2\pi\sqrt{\dfrac{x_2^2-x_1^2}{v_1^2-v_2^2}}$ (2) $2\pi\sqrt{\dfrac{v_1^2+v_2^2}{x_1^2+x_2^2}}$

(3) $2\pi\sqrt{\dfrac{v_1^2-v_2^2}{x_1^2-x_2^2}}$ (4) $2\pi\sqrt{\dfrac{x_1^2+x_2^2}{v_1^2+v_2^2}}$

$T = ?$

$V = \omega\sqrt{A^2 - x^2}$

$V_1 = \omega\sqrt{A^2 - x_1^2}$

$V_2 = \omega\sqrt{A^2 - x_2^2}$

$\left(\dfrac{V_1}{\omega}\right)^2 = A^2 - x_1^2$

$\left(\dfrac{V_2}{\omega}\right)^2 = A^2 - x_2^2$

$\dfrac{1}{\omega^2}\left(V_1^2 - V_2^2\right) = x_2^2 - x_1^2$

$\omega^2 = \sqrt{\dfrac{V_1^2 - V_2^2}{x_2^2 - x_1^2}}$

$\dfrac{2\pi}{T} = \sqrt{\dfrac{V_1^2 - V_2^2}{x_2^2 - x_1^2}}$

$T = 2\pi\sqrt{\dfrac{x_2^2 - x_1^2}{V_1^2 - V_2^2}}$

Question no. 9

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Two waves are represented by (in same medium)

$y_1 = 5 \sin 2\pi (75t - 0.25x)$

$y_2 = 10 \sin 2\pi (150t - 0.50x)$

The intensity ratio $\frac{I_1}{I_2}$ of the two waves is

(1) 1 : 2 (2) 1 : 4

(3) 1 : 8 (4) 1 : 16

$\omega = 2\pi f$

$\omega \propto f$

$I = 2\pi f^2 A^2 \rho V$

$I \propto f^2 A^2$

$\frac{I_1}{I_2} = \frac{f_1^2 A_1^2}{f_2^2 A_2^2} = \frac{\omega_1^2 A_1^2}{\omega_2^2 A_2^2}$

$\frac{I_1}{I_2} = \left(\frac{75}{150}\right)^2 \times \left(\frac{5}{10}\right)^2$

$= \frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$

Question no. 10

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The equation of a wave travelling on a string is $y_F = 4 \sin\left[\frac{\pi}{2}\left(8t - \frac{x}{8}\right)\right]$, where x, y are in cm and t is in second. The velocity of the wave is :–

(1) 64 cm/s in – x –direction

(2) 32 cm/s in – x –direction

(3) 32 cm/s in + x –direction

(4) 64 cm/s in + x –direction

$y = 4\sin\left(4\pi t - \frac{\pi x}{16}\right)$ (+ , −)

$y = A\sin(\omega t - kx)$

$V = \frac{\omega}{k} = \frac{4\pi}{\frac{\pi}{16}} \Rightarrow 64\ \frac{cm}{s}$

Question no. 11

AAYAM CAREER INSTITUTE

Two vibrating tuning forks produce progressive wave given by $y_1 = 6 \sin 300\pi t$ and $y_2 = 8 \sin 304\pi t$. Number of beats produced per minute is:

(1) 2

(2) 4

(3) 120

(4) 240

$\omega_1 = 300\pi$

$2\pi f_1 = 300\pi$

$f_1 = 150$

$\omega_2 = 304\pi$

$2\pi f_2 = 304\pi$

$f_2 = 152$

$f_B = (152 - 150) = 2 \frac{beat}{s}$

$f_B = 2 \times 60 \Rightarrow 120 \frac{beats}{min}$

Question no. 12

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The ratio of the velocity of sound in hydrogen to that in helium at the same temperature is

(1) $\sqrt{\frac{5}{42}}$ (2) $\sqrt{\frac{5}{21}}$

(3) $\frac{\sqrt{42}}{5}$ (4) $\frac{\sqrt{21}}{5}$

$V = \sqrt{\frac{\gamma RT}{M}}$

$\gamma = 1 + \frac{2}{f}$

$\gamma_H = 1 + \frac{2}{5} = \frac{7}{5}$

$\gamma_{He} = 1 + \frac{2}{3} = \frac{5}{3}$

$\frac{V_H}{V_{He}} = \sqrt{\frac{\gamma_H}{M_H} \times \frac{M_{He}}{\gamma_{He}}} = \sqrt{\frac{\frac{7}{5}}{\frac{2}{1}} \times \frac{4}{\frac{5}{3}}}$

$= \sqrt{\frac{7}{5 \times 2} \times \frac{4 \times 3}{5 \times 1}}$

$\frac{V_H}{V_{He}} = \sqrt{\frac{42}{25}} = \frac{\sqrt{42}}{5}$

Question no. 13

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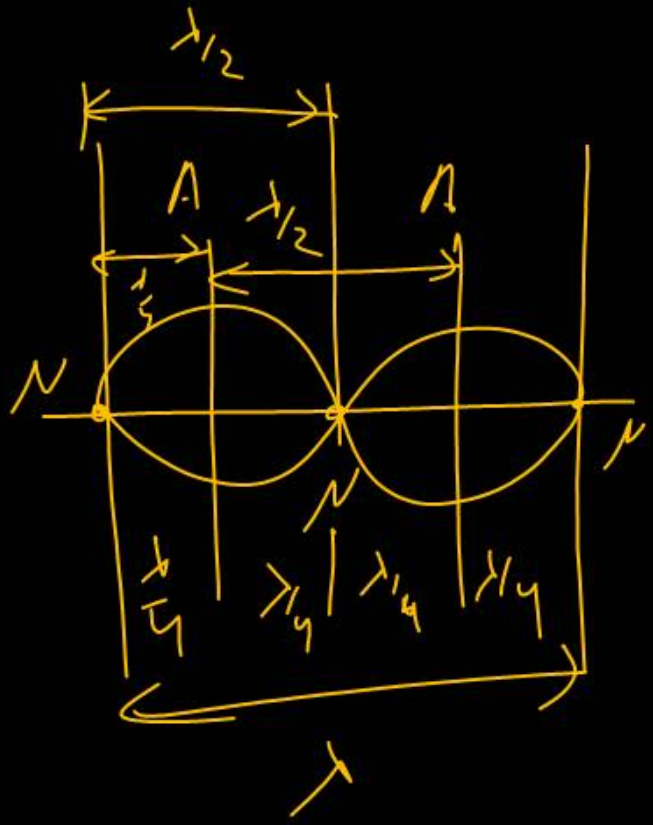
Which of the following statements is correct?

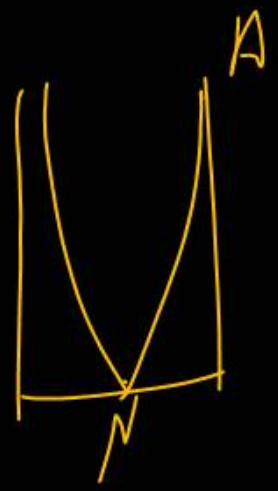
(1) The distance between any two consecutive antinodes or nodes is $\frac{\lambda}{4}$.

(2) The distance between a node and adjoining antinode is $\frac{\lambda}{4}$.

(3) Node is formed at open end.

(4) antinode is formed at closed end.





Question no. 14

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In an organ pipe of length L open at both ends, the fundamental mode has a frequency

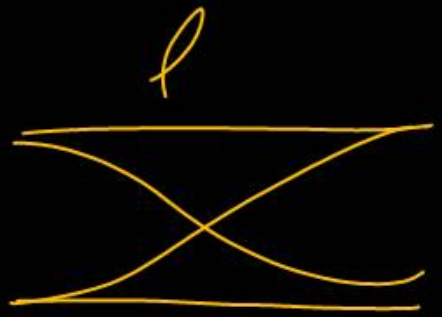
(where v is the speed of sound in air)

(1) $\frac{v}{2L}$ and only odd harmonics are present.

(2) $\frac{v}{2L}$ and only even harmonics are present.

(3) $\frac{v}{2L}$ and all harmonics are present.

(4)



$f_1 = f_0 = \frac{V}{2l}$

$f_2 = 2f_0, 3f_0$

Question no. 15

AAYAM CAREER INSTITUTE

Which of the following statements is true for wave motion?

(1) Mechanical transverse waves can propagate through all mediums.

(2) Longitudinal waves can propagate through solids only.

(3) Mechanical transverse waves can propagate through solids only.

(4) Longitudinal waves can propagate through vacuum.

Question no. 16

The volume of a metal sphere increases by 0.24% when its temperature is raised by 40°C. The coefficient of linear expansion of the metal is

(1) $2 \times 10^{-5}\ °C^{-1}$ (2) $6 \times 10^{-5}\ °C^{-1}$

(3) $18 \times 10^{-5}\ °C^{-1}$ (4) $1.2 \times 10^{-5}\ °C^{-1}$

$$\frac{\Delta V}{V} \times 100 = 0.24$$

$$\frac{\Delta V}{V} = 24 \times 10^{-4}$$

$$\Delta T = 40°C$$

$$\Delta V = V\gamma\Delta T$$

$$\Delta V = V 3\alpha \Delta T$$

$$\alpha = \frac{1}{3}\left(\frac{\Delta V}{V \Delta T}\right)$$

$$\alpha = \frac{1}{3}\,\frac{24 \times 10^{-4}}{40}$$

$$= 0.2 \times 10^{-4}$$

$$= 2 \times 10^{-5}/°C$$

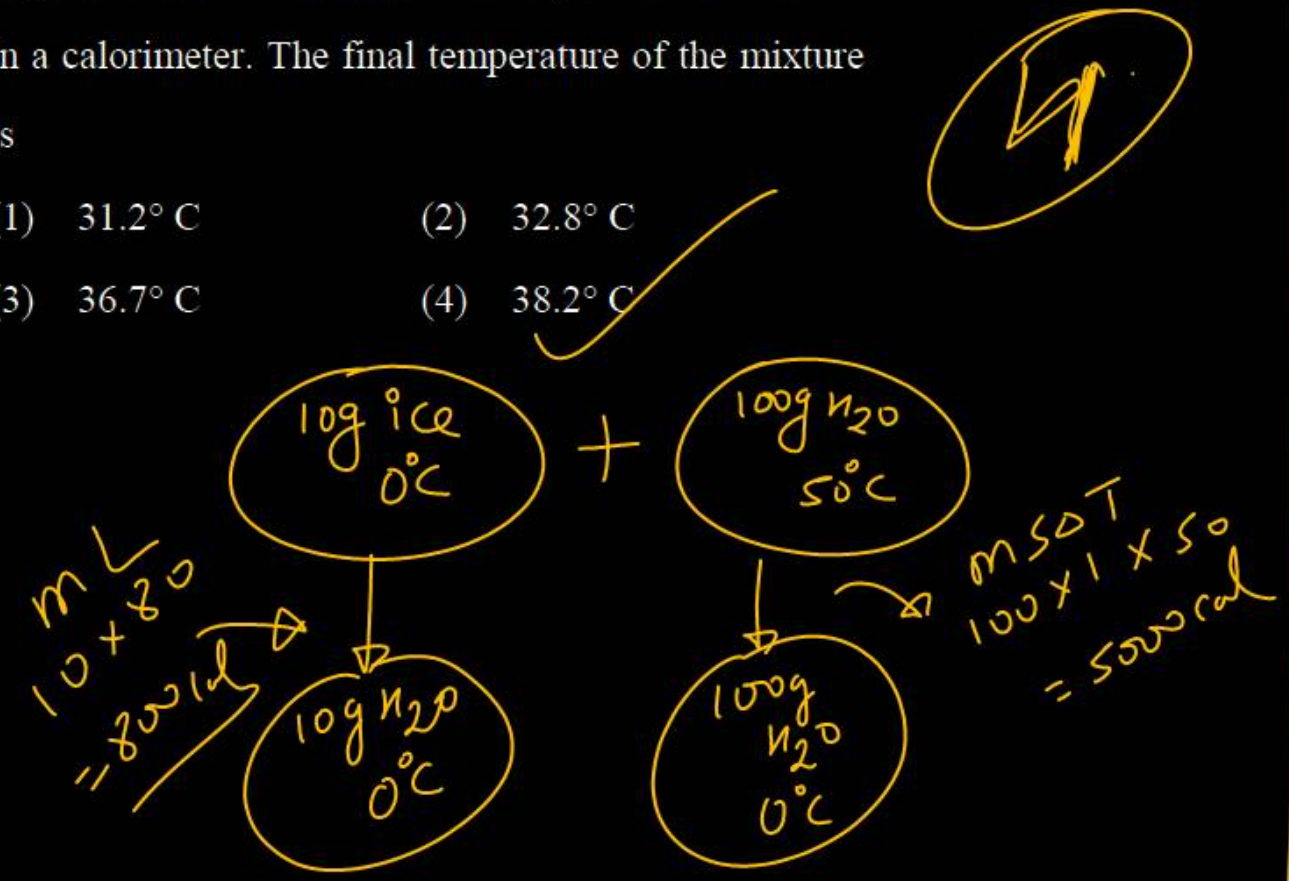
(1)

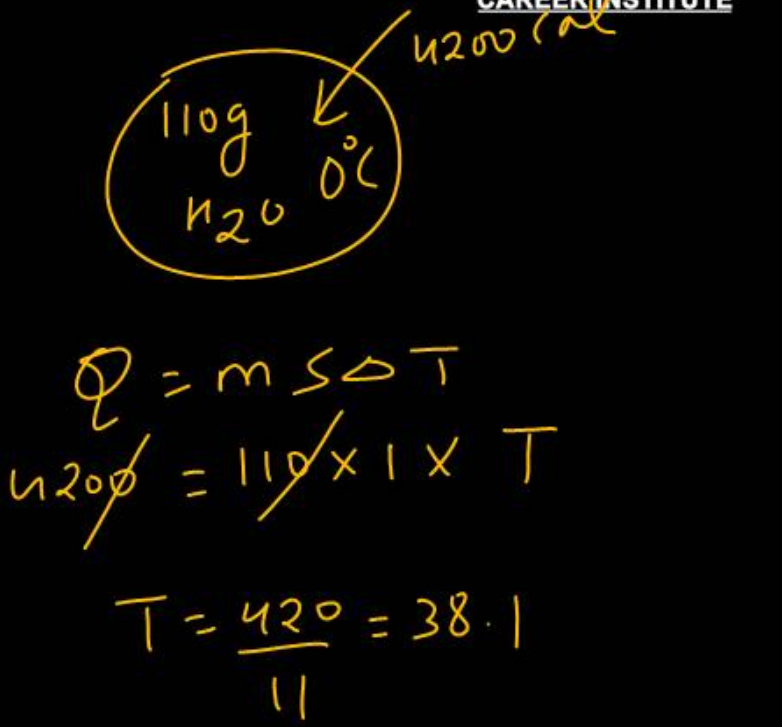
Question no. 17

10g of ice at 0°C is mixed with 100g of water at 50° C in a calorimeter. The final temperature of the mixture is

(1) 31.2° C (2) 32.8° C

(3) 36.7° C (4) 38.2° C





Question no. 18

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The triple point of carbon dioxide is 216.5 K the corresponding temperature on the celsius and Fahrenheit scale respectively are

(1) 56.45°C, – 69.61°F

(2) – 56.45°C, 69.61°F

(3) 56.45°C, 69.61°F

(4) – 56.45°C, – 69.61°F

$$\frac{C}{100} = \frac{K-273.15}{100} = \frac{F-32}{180}$$

$$\frac{C}{100} = \frac{216.5-273.15}{100}$$

$$\frac{216.5-273.15}{100} = \frac{F-32}{180}$$

4

Question no. 19

AAYAM CAREER INSTITUTE

Consider a composite slab consisting of two different materials having equal thickness and thermal conductivities K and 2 K respectively. The equivalent thermal conductivity of the slab is

(1) $\frac{2}{3}$K

(2) $\sqrt{2}$K

(3) 3 K

(4) $\frac{4}{3}$K

$$K_{eq} = \frac{2K_1K_2}{K_1+K_2}$$

$$= \frac{2(K)(2K)}{3K}$$

$$= 4K/3$$

(4)

Question no. 20

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A rectangular body has maximum intensity wavelength λ_m at 2000 K. Its corresponding wavelength at 3000 K will be

(1) $\frac{3}{2}\lambda_m$ (2) $\frac{2}{3}\lambda_m$

(3) $\frac{16}{81}\lambda_m$ (4) $\frac{81}{16}\lambda_m$

Wein's displ. Law

$\lambda_{m_1} T_1 = \lambda_{m_2} T_2$

$\lambda_m 2000 = \lambda_{m_2} 3000$

$\lambda_{m_2} = \frac{2}{3}\lambda_m$

2.

Question no. 21

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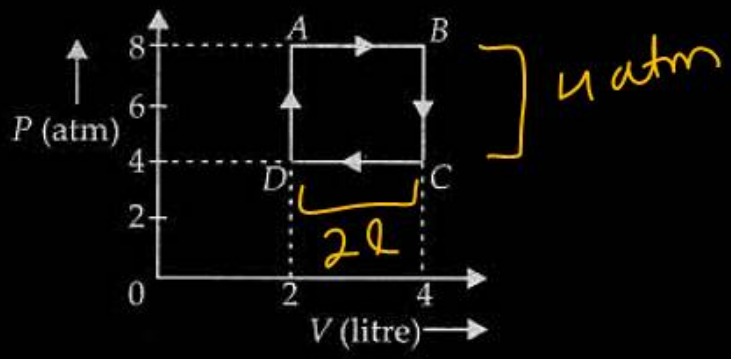
One mole of an ideal gas undergoes a cyclic process ABCDA as shown in the P–V diagram. The net work done in the process is



(1) 500 J

(2) 700 J

(3) 800 J

(4) 900 J

$W = \text{area}$

$= 4\ \text{atm} \times 2\ \ell$

$= 4 \times 10^5\ \text{Pa} \times 2 \times 1000\ (\text{m}^3)$

$= 8 \times 10^5 \times 10^{-3}\ \text{J}$

$= 800\ \text{J}$

3.

Question no. 22

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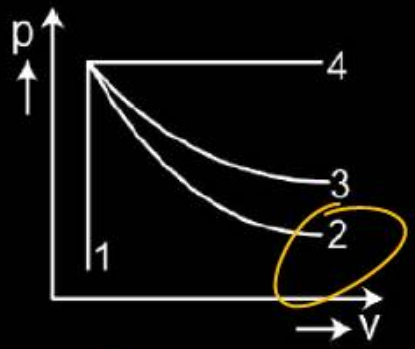
An ideal gas undergoes four different processes from the same initial state as shown in P–V diagram. Four processes are adiabatic, isothermal, isobaric and isochoric. Out of 1, 2, 3 and 4 which one is adiabatic?

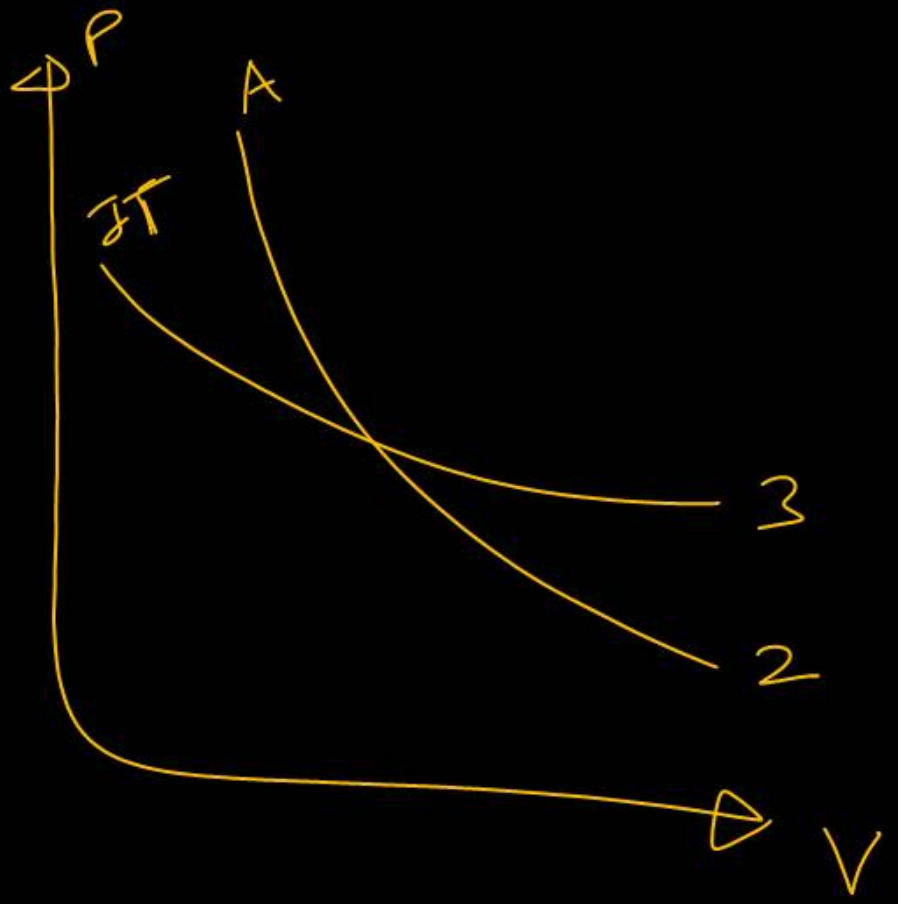


(1) 4

(2) 3

(3) 2

(4) 1



3

Question no. 23

At what temperature is the rms velocity of hydrogen molecule equal to that of an oxygen molecule at 47°C?

(1) 10 K (2) 20 K

(3) 30 K (4) 40 K

$$V_{rms} = \sqrt{\frac{3RT}{M}}$$

$$\frac{T_1}{M_1} = \frac{T_2}{M_2}$$

$$\frac{T_1}{2} = \frac{(273+47)}{32}$$

$$\frac{T_1}{2} = \frac{320}{32}$$

$$T_1 = 20\,K$$

(2)

Question no. 24

Three mole of oxygen are mixed with two moles of helium. What will be the ratio of specific heats at constant pressure and constant volume for the mixture?

(1) 2.5 (2) 3.5

(3) 1.5 (4) 1

(3)

$O_2 \rightarrow C_{P_1} = 7R/2$

$O_2 \rightarrow C_{V_1} = 5R/2$

$He \rightarrow C_{P_2} = 5R/2$

$He \rightarrow C_{V_2} = 3R/2$

$$\frac{(C_P)_{mix}}{(C_V)_{mix}} = \frac{n_1 C_{P_1} + n_2 C_{P_2}}{n_1 C_{V_1} + n_2 C_{V_2}}$$

$$= \frac{3\left(\frac{7R}{2}\right) + 2\left(\frac{5R}{2}\right)}{3\left(\frac{5R}{2}\right) + 2\left(\frac{3R}{2}\right)}$$

$$= \frac{21 + 10}{15 + 6} = \frac{31}{21} \approx 1.5$$

Question no. 25

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The average energy per molecule of a triatomic gas at room temperature T is

(1) 3 kT

(2) $\frac{1}{2}$kT

(3) $\frac{3}{2}$kT

(4) $\frac{5}{2}$kT

$f = 6$

$\frac{f}{2} K_B T$

$\frac{6}{2} K_B T$

$3K_B T$

1

Question no. 26

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If a gas has n degrees of freedom then ratio of specific heats of gas is

(1) $\frac{1+n}{2}$

(2) $1+\frac{1}{n}$

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

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

$$\frac{C_P}{C_V} = \frac{\left(1+\frac{f}{2}\right)R}{\frac{fR}{2}} = \frac{(2+f)\,R/2}{\frac{f}{2}R} = \frac{2+f}{f}$$

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

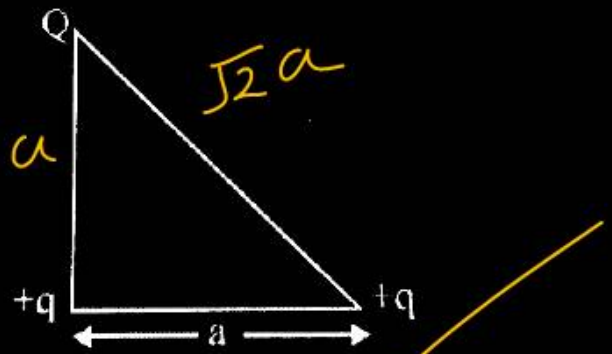
$$= 1+\frac{2}{n}$$

(1)

Question no. 27

Three charges Q, + q and +q are placed at the vertices of a right–angled isosceles triangle as shown.

The net electrostatic energy of the configuration is zero if Q is equal to



(1) $\frac{-q}{1+\sqrt{2}}$

(2) $\frac{-2q}{2+\sqrt{2}}$

(3) $-2q$

(4) $+q$

$U_{syst} = 0$

$$\frac{kQq}{a} + \frac{kQq}{\sqrt{2}a} + \frac{kqq}{a} = 0$$

$$Q + \frac{Q}{\sqrt{2}} + q = 0$$

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

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

$$Q = \frac{-\sqrt{2}q}{\sqrt{2}+1}$$

$$Q = \frac{-2q}{2+\sqrt{2}}$$

2.

Question no. 28

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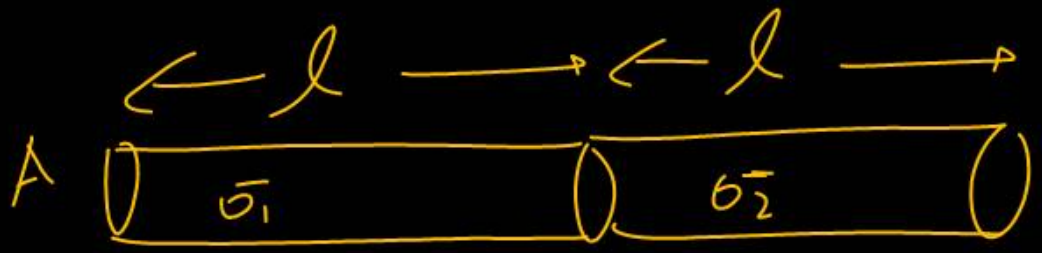
Two metal wires of identical dimensions are connected in series. If σ_1 and σ_2 are the conductivities of the metals respectively, the effective conductivity of the combination is

(1) $\sigma_1 + \sigma_2$

(2) $\frac{\sigma_1 + \sigma_2}{2}$

(3) $\sqrt{\sigma_1 \sigma_2}$

(4) $\frac{2\sigma_1\sigma_2}{\sigma_1 + \sigma_2}$



$$R_{eq} = R_1 + R_2$$

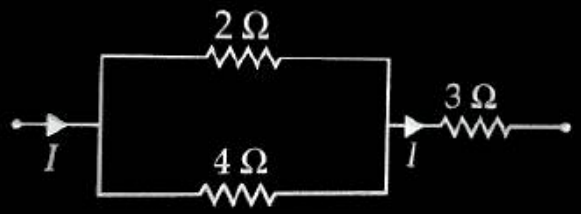
$$\frac{1}{\sigma_{eq}} \frac{2l}{A} = \frac{1}{\sigma_1} \frac{l}{A} + \frac{1}{\sigma_2} \frac{l}{A}$$

$$\frac{2}{\sigma_{eq}} = \frac{\sigma_1 + \sigma_2}{\sigma_1 \sigma_2} \rightarrow \sigma_{eq} = \frac{2\sigma_1\sigma_2}{\sigma_1 + \sigma_2}$$

(4)

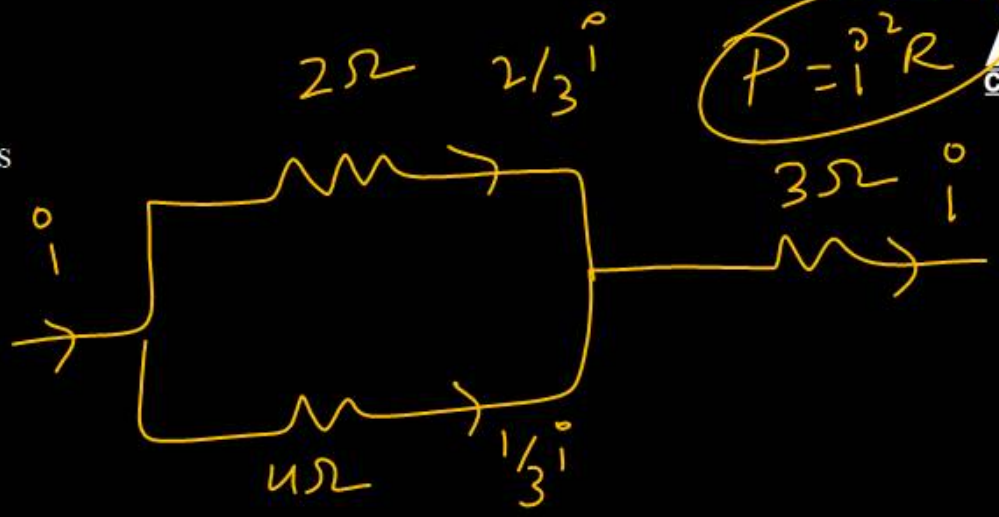
Question no. 29

In the circuit shown in figure heat developed across 2Ω, 4Ω and 3Ω resistance are in the ratio of



(1) 2 : 4 : 3 (2) 8 : 4 : 12

(3) 4 : 8 : 27 (4) 8 : 4 : 27



$P = i^2R$

$P_1 : P_2 : P_3 = \left(\frac{2}{3}i\right)^2 2 : \left(\frac{1}{3}i\right)^2 4 : i^2 3$

$= \frac{8}{9} : \frac{4}{9} : 3$

$= 8 : 4 : 27$

(4)

Question no. 30

A proton, a deuteron and an α – particle with same kinetic energy enter perpendicularly in a uniform magnetic field, then the ratio of radii of their circular paths is

(1) $1:1:\sqrt{2}$ (2) $\sqrt{2}:1:1$

(3) $1:\sqrt{2}:1$ (4) $1:2:\sqrt{2}$

$$r = \frac{\sqrt{2mK}}{qB}$$

$$r_1 : r_2 : r_3 = \frac{\sqrt{m_p}}{e} : \frac{\sqrt{2m_p}}{e} : \frac{\sqrt{4m_p}}{2e}$$

$$= 1 : \sqrt{2} : \frac{\sqrt{4}}{2}$$

$$= 1 : \sqrt{2} : 1$$

(3)

Question no. 31

A galvanometer coil has a resistance of 15 Ω and meter shows full scale deflection for current of 4 mA. To convert meter into a voltmeter of range 0 to 18 V, the required resistance is –

(1) 5885 Ω in series

(2) 4485 Ω in series

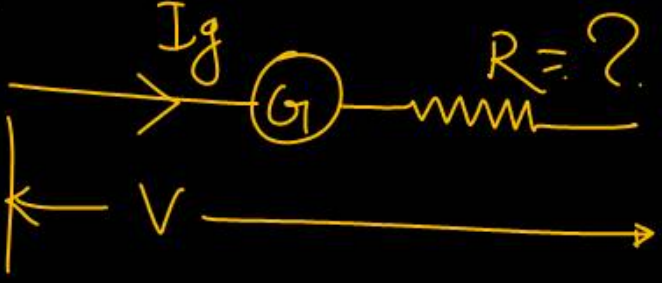
(3) 5885 Ω in parallel

(4) 4485 Ω in parallel

$G = 15\ \Omega$.

$I_g = 4 \times 10^{-3}\ A$.

$V = 18$ volt



$V = I_g(R+G)$

$18 = 4 \times 10^{-3}(R+15)$

$9\ 18 \times 1000 = R+15$

$4500 = R+15$.

$R = 4485\ \Omega$ (Series)

Question no. 32

A dipole of magnetic moment $\vec{M} = 30\hat{j}\ (A m^2)$ is placed along the y–axis in a uniform magnetic field $\vec{B} = (2\hat{i} + 5\hat{j})$ T. The torque acting on it is

(1) $-40k$ N m (2) $-50k$ N m

(3) $-60k$ N m (4) $-70k$ N m

$\vec{\tau} = \vec{M} \times \vec{B}$

$\vec{\tau} = 30\hat{j} \times (2\hat{i} + 5\hat{j})$

$\vec{\tau} = 30 \times 2(\hat{j} \times \hat{i})$

$\vec{\tau} = -60\hat{k}$ (Nm)

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Question no. 33

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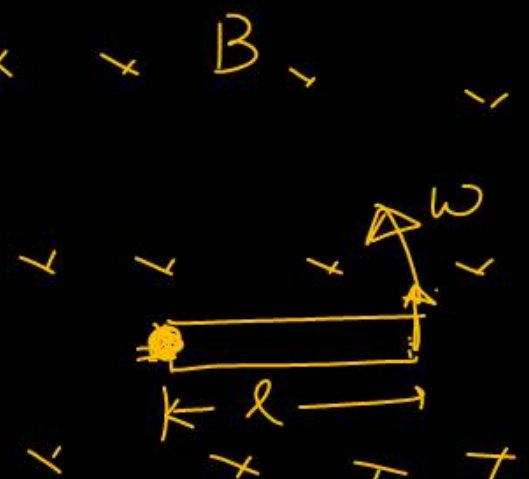
A copper rod of length l rotates about its end with angular velocity ω in a uniform magnetic field B. The emf developed between the ends of the rod if the field is normal to the plane of rotation is

(1) $B\omega l^2$

(2) $\frac{1}{2} B\omega l^2$

(3) $2 B\omega l^2$

(4) $\frac{1}{4} B\omega l^2$



$\varepsilon = B V_{Avg} l$

$V = \omega l$

$\varepsilon = B\left(\frac{0+V}{2}\right) \cdot l$

$\varepsilon = \frac{BVl}{2} \Rightarrow \varepsilon = \frac{B}{2} \times l \cdot \omega \cdot l = \frac{B\omega l^2}{2}$

$\varepsilon = \frac{B\omega l^2}{2}$

Question no. 34

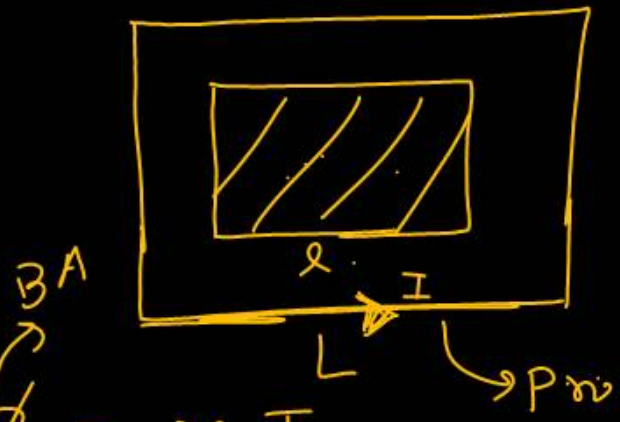
A small square loop of wire of side l is placed inside a large square loop of wire of side L ($>> l$). The loops are coplanar and their centres coincide. What is the mutual inductance of the system?

(1) $2\sqrt{2}\frac{\mu_0}{\pi}\frac{l^2}{L}$

(2) $8\sqrt{2}\frac{\mu_0}{\pi}\frac{l^2}{L}$

(3) $2\sqrt{2}\frac{\mu_0}{2\pi}\frac{l^2}{L}$

(4) $2\sqrt{2}\frac{\mu_0 L^2}{\pi l}$



$\phi = MI$

$\frac{\mu_0}{\pi L} \times \frac{I}{\sqrt{2}} \times 4 \times l^2 = MI$

$\frac{\mu_0}{\pi L} \times \frac{\sqrt{2}\times\sqrt{2}\times 2\, l^2}{\sqrt{2}} = M$

$\frac{\mu_0}{\pi L} 2\sqrt{2}\, l^2 = M$

$B = \frac{\mu_0 I}{4\pi\gamma}(\sin\theta + \sin\theta)$

$B_{net} = 4 \times \frac{\mu_0 I}{4\pi\gamma}(2\sin 45)$

$= \frac{\mu_0 I}{\pi \frac{L}{2}} \times 2 \times \frac{1}{\sqrt{2}}$

$B_{Square} = \frac{\mu_0}{\pi}\frac{I}{L}\times 4\frac{1}{\sqrt{2}}$

Question no. 35

The Q factor of a series LCR circuit with L = 2 H, C = 32 μ F and R = 10 Ω is

(1) 15 (2) 20

(3) 25 (4) 30

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

$$Q = \frac{1}{10}\sqrt{\frac{2\times 10^6}{32}}$$

$$Q = \frac{1}{10}\times\frac{1}{4}\times 10^3$$

$$Q = \frac{100}{4}$$

$$Q = 25$$

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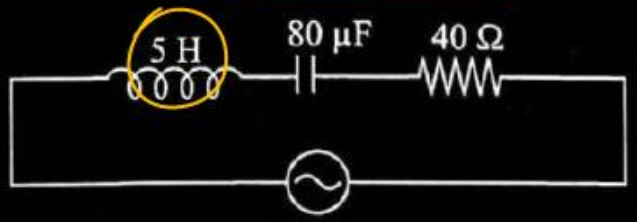
Question no. 36

Figure shows a series LCR circuit connected to a variable frequency 230 V source.



The source frequency which drives the circuit in resonance is

(1) 4 Hz (2) 5 Hz

(3) 6 Hz (4) 8 Hz

$$f = \frac{1}{2\pi\sqrt{LC}}$$

$$f = \frac{1}{2\times\frac{22}{7}} \times \frac{1}{\sqrt{LC}}$$

$$f = \frac{7}{44} \times \frac{1}{\sqrt{5\times80\times10^{-6}}}$$

$$f = \frac{7}{44} \times \frac{1}{\sqrt{400\times10^{-6}}}$$

$$f = \frac{7}{44} \times \frac{1}{\sqrt{4\times10^{-4}}}$$

$$f = \frac{7}{44} \times \frac{1}{2\times10^{-2}}$$

$$f = \frac{7\times10^{2}}{44\times2}$$

$$f = \frac{7\times50}{44}$$

$$f = \frac{7\times25}{22}$$

$$f = \frac{175}{22}$$

$$f = 7.9\ldots$$

Question no. 37

A step down transformer converts transmission line voltage from 11000 V to 220 V. The primary of the transformer is 60%. If the output power is 9 kW, then the input power will be

(1) 11 kW (2) 12 kW

(3) 14 kW (4) 15 kW

$$\eta = \frac{P_{out}}{P_{in}}$$

$$\frac{60}{100} = \frac{9}{P_{in}}$$

$$P_{in} = \frac{90}{6}$$

$$P_{in} = 15 \text{ kW}$$

Question no. 38

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If μ_0 be the permeability and ε_0 be the permittivity of a medium, then its refractive index is given by

(1) $\frac{1}{\sqrt{\mu_0\varepsilon_0}}$ (2) $\frac{1}{\mu_0\varepsilon_0}$

(3) $\sqrt{\mu_0\varepsilon_0}$ (4) $\mu_0\varepsilon_0$

Question no. 39

The de Broglie wavelength of a particle of kinetic energy K is λ. What will be the wavelength of the particle, if its kinetic energy is $\frac{K}{4}$?

(1) λ (2) 2λ

(3) $\frac{\lambda}{2}$ (4) 4λ

$$\lambda = \frac{h}{\sqrt{2mK}}$$

$$\lambda \propto \frac{1}{\sqrt{K}}$$

$$\frac{\lambda_2}{\lambda_1} = \sqrt{\frac{K_1}{K_2}}$$

$$\frac{\lambda_2}{\lambda} = \sqrt{\frac{K}{\frac{K}{4}}}$$

$$\frac{\lambda_2}{\lambda} = \sqrt{4}$$

$$\lambda_2 = 2\lambda$$

Question no. 40

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The mass of $^{7}_{3}Li$ is 0.042 amu less than the sum of masses of its constituents. The binding energy per nucleon is

(1) 5.586 MeV (2) 10.522 MeV

(3) 2.433 MeV (4) 3.739 MeV

$$\frac{B.E}{N} = \frac{\Delta m \times 931 \text{ (MeV)}}{A}$$

$$= \frac{0.042 \times 931}{7}$$

$$= 5.586 \text{ M}$$

Question no. 41

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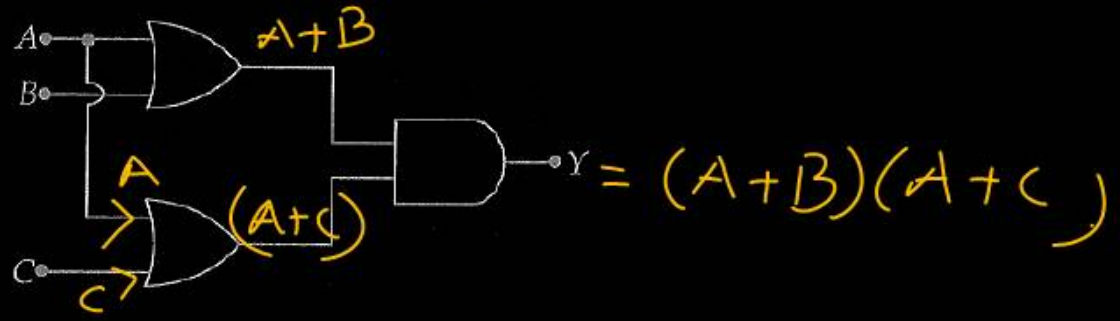
The output of given logic circuit is



(1) A . (B + C)

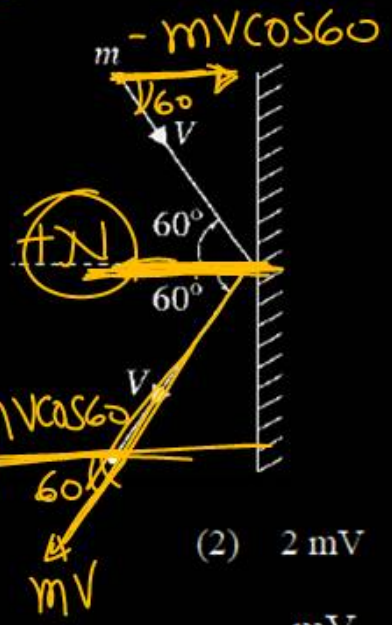
(2) A . (B . C)

(3) (A + B) . (A + C)

(4) A + B + C

Question no. 42

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



(1) mV

(2) 2 mV

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

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

$I = \Delta P$

$J = P_f - P_i$

$= mV\cos 60 - (-mV\cos 60)$

$= 2mV\cos 60$

$= 2mV \times \frac{1}{2}$

$= mV$

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Question no. 43

The coefficient of friction between the tyres and road is 0.1. The maximum speed with which a cyclist can take a circular turn of radius 3 m without skidding is (Take $g = 10\ m\ s^{-2}$)

(1) $\sqrt{15}\,ms^{-1}$

(2) $\sqrt{3}\,ms^{-1}$

(3) $\sqrt{30}\,ms^{-1}$

(4) $\sqrt{10}\,ms^{-1}$

$\mu = 0.1$

$r = 3m$.

$V = \sqrt{\mu r g}$

$V = \sqrt{0.1 \times 3 \times 10}$

$V = \sqrt{3}\ (m/s)$

Question no. 44

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A cord of negligible mass is wound round the rim of a flywheel of mass 20 kg and radius 20 cm. A steady pull of 25 N is applied on the cord to drag it downward. The work done by the pull when 2 m of the cord is unwound is, if the rim was initially at the rest position–

(1) 20 J
(2) 25 J
(3) 45 J
(4) 50 J

$W = Fd.$

$W = 25 \times 2$

$W = 50\ J.$

Question no. 45

Match List– I with List–II

	List–I		List–II
A.	Moment of inertia of solid sphere of radius R about any tangent	I.	$\frac{5}{3}MR^2$
B.	Moment of inertia of hollow sphere of radius (R) about my tangent	II.	$\frac{7}{5}MR^2$
C.	Moment of inertia of circular ring of radius (R) about its diameter.	III.	$\frac{1}{4}MR^2$
D.	Moment of inertia of circular disc of radius (R) about any diameter	IV.	$\frac{1}{2}MR^2$

Choose the correct answer from the options given below.

(1) A–II, B–I, C–IV, D–III

(2) A–I, B–II, C–IV, D–III

(3) A–II, B–I, C–III, D–IV

(4) A–I, B–II, C–III, D–IV

A – II

$I = \frac{2}{5}MR^2 + MR^2$

$\hookrightarrow_{\text{sphere}} = \frac{7}{5}MR^2$

$I = \frac{2}{3}MR^2 + MR^2$

B – I

$I = \frac{5}{3}MR^2$

$I_z = I_D + I_D$

ring $MR^2 = 2I_D$

$I_D = \frac{MR^2}{2}$

C → IV

D → III $I_D = \frac{MR}{4}$

Question no. 46

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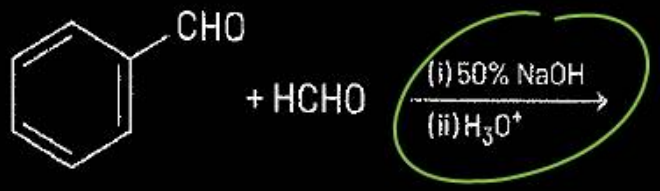
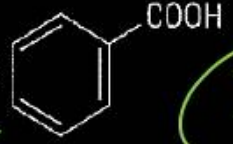
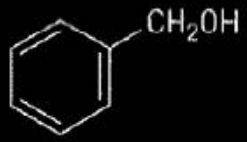
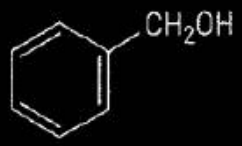
Major products of the following reaction are

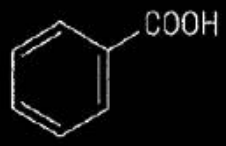


(1) CH_3OH and HCO_2H

(2) CH_3OH and 

(3) HCOOH and 

(4) 

and 

Cannizaro Rxn

RCHO → RCOOH
RCHO → RCH_2OH

Cross/Mixed Cannizaro

→ more reactive aldehyde → oxidation (HCHO → HCOOH)

→ less reactive aldehyde → Reduction

Reactivity $\propto \frac{1}{\text{steric hindrance}}$

3

Question no. 47

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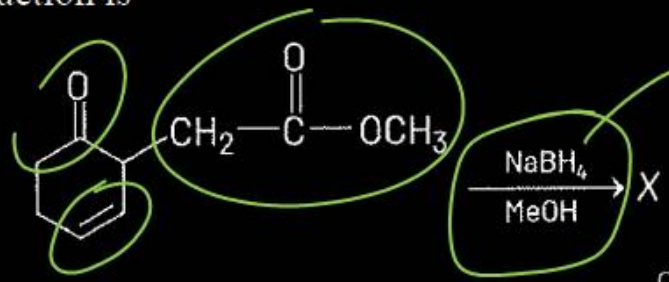
The major product 'X' formed in the following reaction is



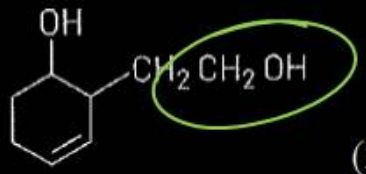
$\xrightarrow[MeOH]{NaBH_4}$ X

Red. agent

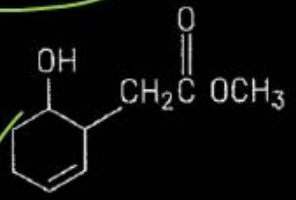
Ald. → 1° alc.

Ketone → 2° alc.

(1)

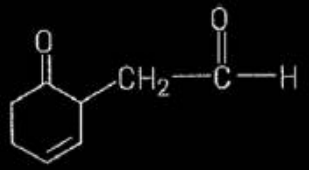


(2)

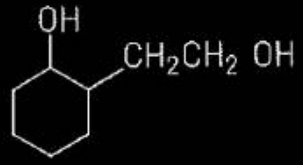


2

(3)



(4)



Question no. 48

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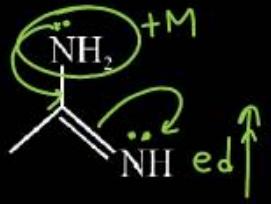
The increasing order of basicity of the following compounds is

I. 

II. 

III. 

IV. 

(1) I < II < III < IV

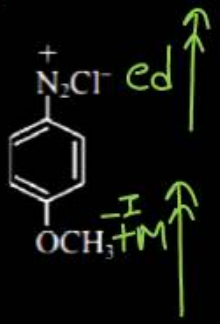
(2) II < I < III < IV

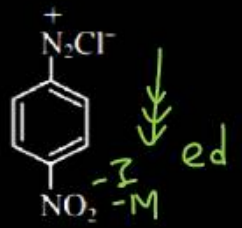
(3) II < I < IV < III

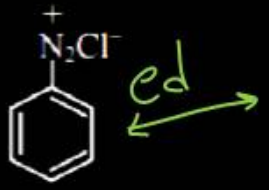
(4) IV < II < I < III

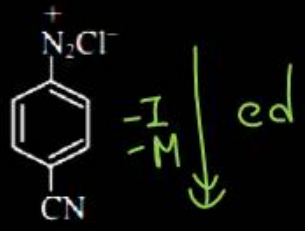
Question no. 49

The correct stability order of the following diazonium salt is

A. 

B. 

C. 

D. 

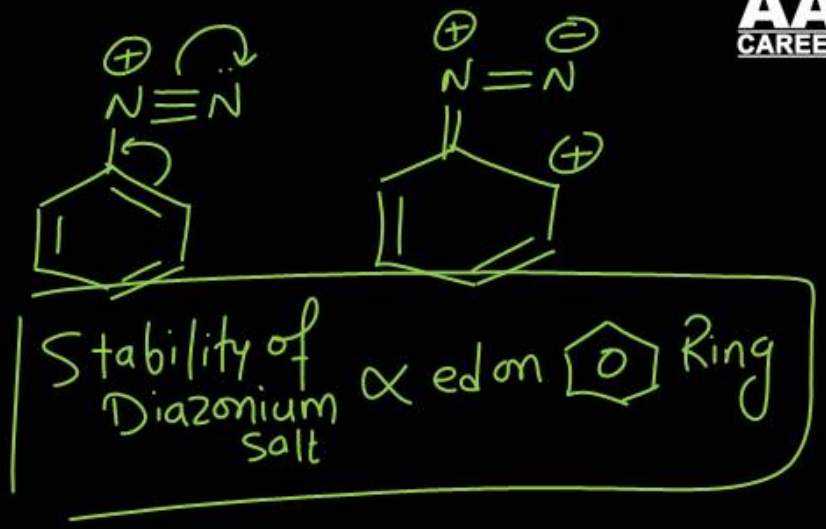
2

(1) A > B > C > D

(2) A > C > D > B

(3) ~~C > A > D > B~~

(4) ~~C > D > B > A~~



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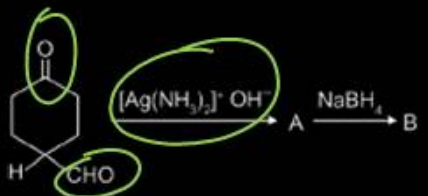
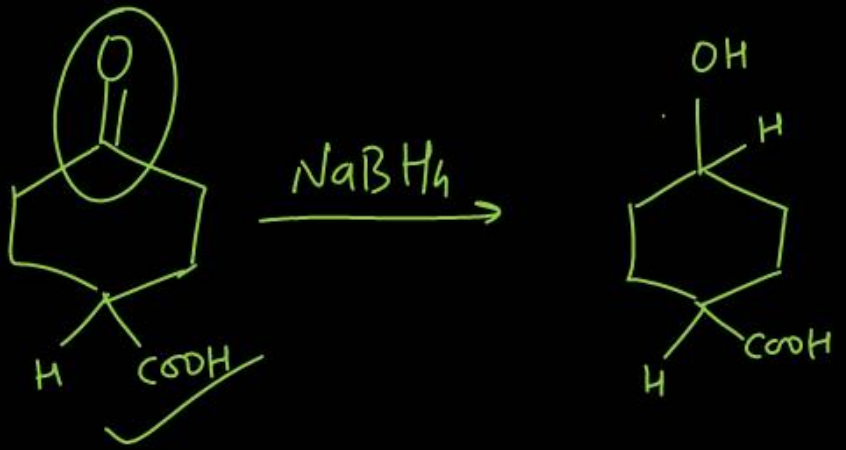
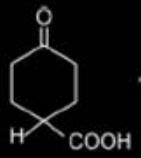
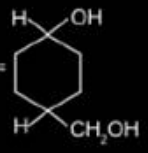
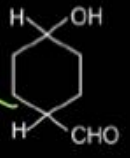
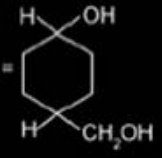
Question no. 50

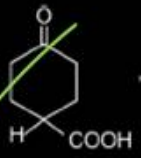
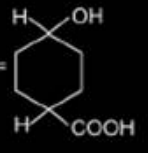
The products formed in the following reaction, A and B are

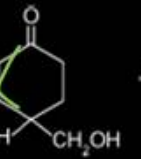
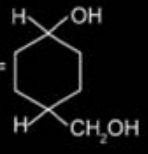




(1) A =  , B = 

(2) A =  , B = 

(3) A =  , B = 

(4) A =  , B = 

3

Question no. 51

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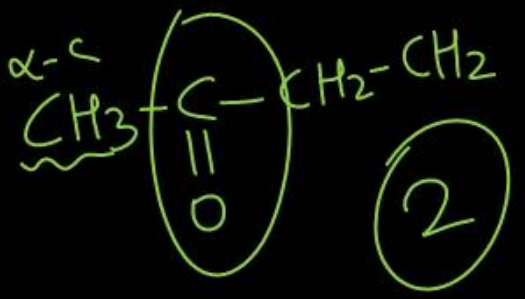
A compound with molecular formula C_4H_8O gives a positive haloform test and a 2, 4-DNP derivative. The compound is

(1) $CH_3CH_2CH_2CHO$ (2) $CH_3COCH_2CH_3$

(3) $(CH_3)_2CHCHO$ (4) All the above



α-Methyl Ketone

2-one

Question no. 52

AAYAM CAREER INSTITUTE

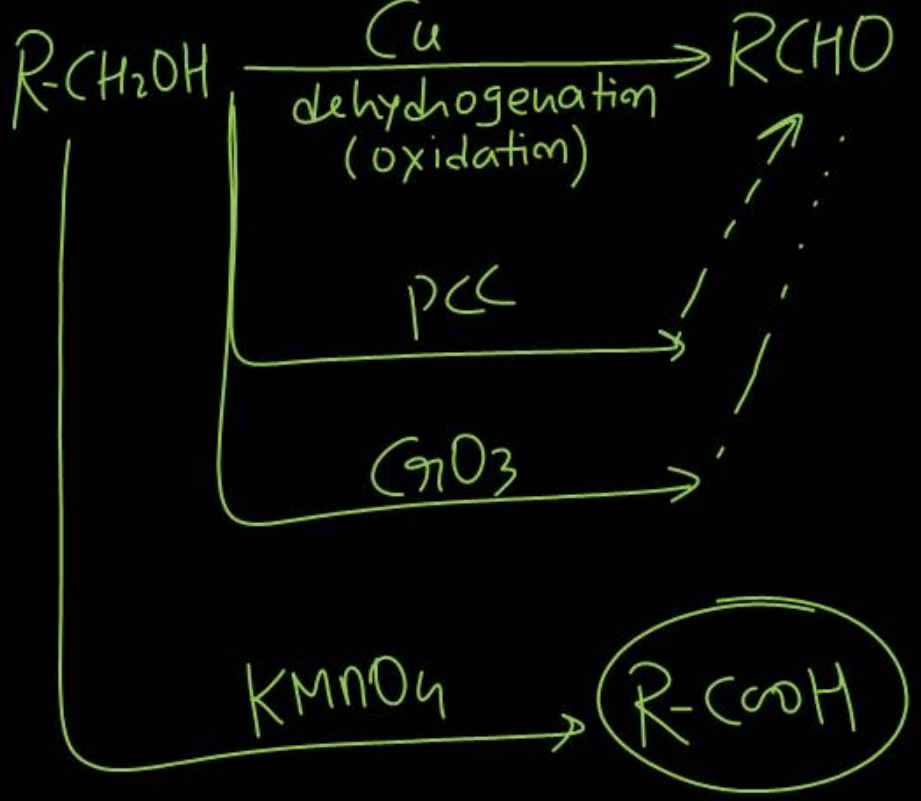
Which of the following reagents cannot be used to oxidize primary alcohols to aldehydes?

(1) Heat in the presence of Cu at 573 K.

(2) Pyridinium clorochromate

(3) CrO_3 in anhydrous medium

(4) $KMnO_4$ in acidic medium



Question no. 53

The correct order of the basic strength of following amines in aqueous medium is

(1) $CH_3NH_2 > (CH_3)_2NH > (CH_3)_3N$

(2) $CH_3NH_2 > (CH_3)_3NH > (CH_3)_2N$

(3) $(CH_3)_2NH > (CH_3)_3N > CH_3NH_2$

(4) $(CH_3)_2NH > CH_3NH_2 > (CH_3)_3N$

4

aq. soln.
R = -CH3

gas phase 3° > 2° > 1°
Basicity ↓

2° > 1° > 3°

$(CH_3)_2NH$ > CH_3-NH_2 > $(CH_3)_3N$

ed ↑ ed ↑ ed ↑

solvation ↑↑ solvation ↑↑ -

Question no. 54

AAYAM CAREER INSTITUTE

The correct increasing order of molecules in accordance with number of lone pair of electrons on central-atom is :

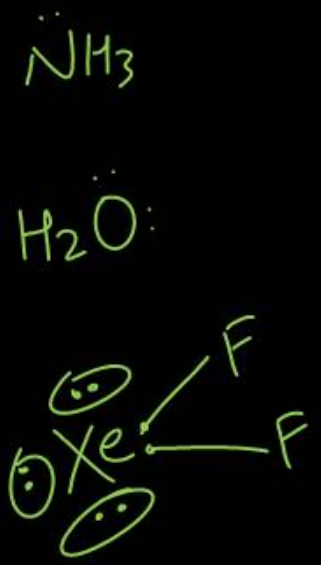
(1) $XeF_2 < H_2O < NH_3$

(2) $XeF_2 < NH_3 > H_2O$

(3) $NH_3 < H_2O < XeF_2$

(4) $H_2O = XeF_2 = NH_3$

3



Question no. 55

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Match List-I with List-II.

	List-I		List-II
A.	Principal quantum Number	i.	Orientation of the orbital
B.	Azimuthal quantum Number	ii.	energy and size of orbital
C.	Magnetic quantum number	iii.	spin of electron
D.	Spin quantum number	iv.	shape of the orbital

A – II
B – IV
C – I
D – III

(1) A – ii, B – iv, C – i, D – iii

(2) A – iv, B – ii, C – i, D – iii

(3) A – ii, B – i, C – iv, D – iii

(4) A – ii, B – iv, C – iii, D – i

Question no. 56

The vapour pressure of pure benzene is 640 mm of Hg. The vapour pressure of solution containing 2.5 gm substance in 39 gm. benzene is 600 mm of Hg then molecular mass of X will be

(1) 65.25 (2) 130

(3) 40 (4) 75

$P_A^\circ = 640 \quad P_S = 600$

$w_B = 2.5, \quad w_A = 39 \quad M_A = 78$

$M_B = ?$

$$\frac{P_A^\circ - P_S}{P_S} = \frac{w_B \times M_A}{M_B \times w_A}$$

$$\frac{640 - 600}{600} = \frac{2.5 \times 78}{M_B \times 39}$$

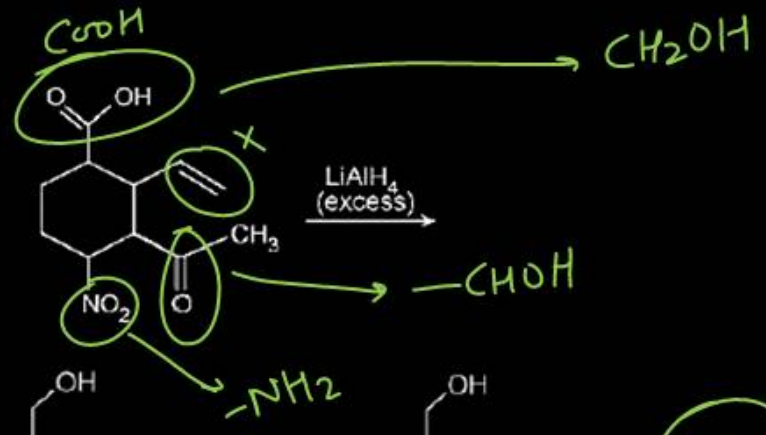
$$\frac{40}{600} = \frac{5}{M_B}$$

$$M_B = 75$$

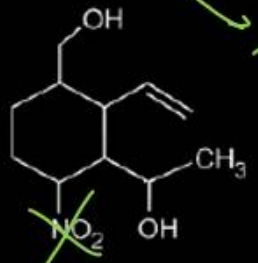
Question no. 57

AAYAM CAREER INSTITUTE

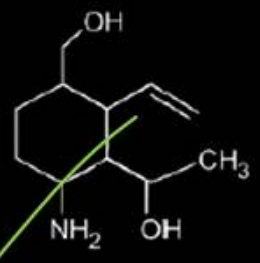
The major product obtained in the following reaction is



(1)

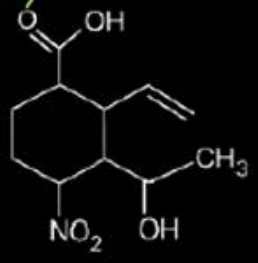


(2)

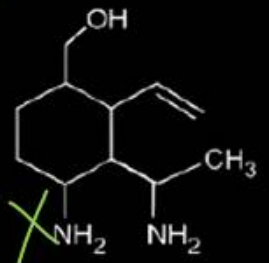


2

(3)



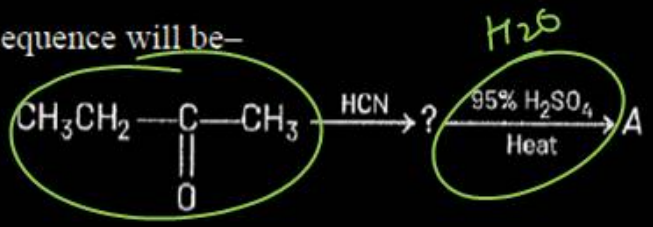
(4)



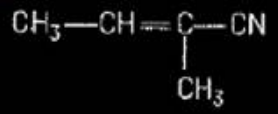
Question no. 58

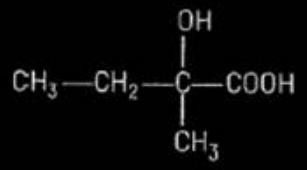
AAYAM CAREER INSTITUTE

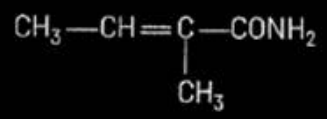
The final product 'A' in the following reaction sequence will be–



(1) 

(2) 

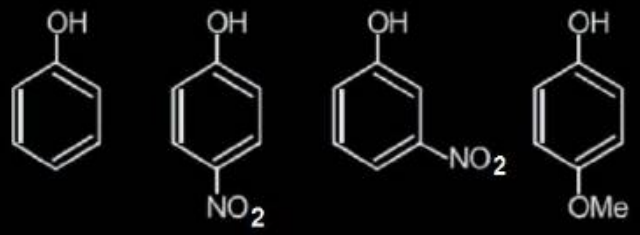
(3) 

(4) 

Question no. 59

AAYAM CAREER INSTITUTE

The increasing order of the pK_a values of the following compounds is

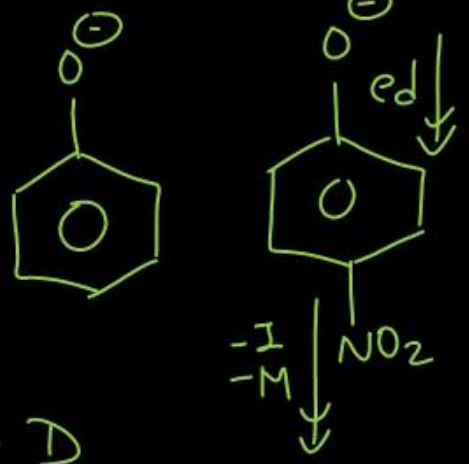


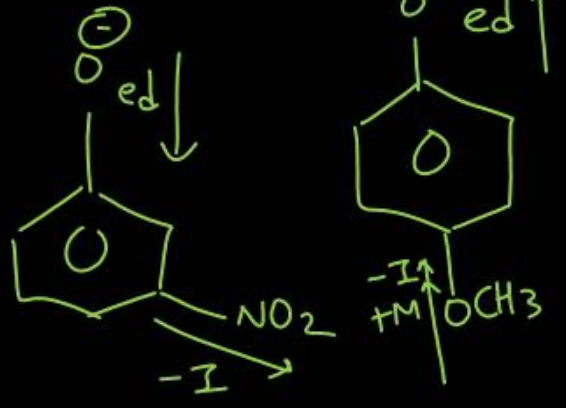
(1) D < A < C < B (2) B < C < A < D

(3) C < B < A < D (4) B < C < D < A

$pK_a \propto \frac{1}{\text{acidity}}$

2





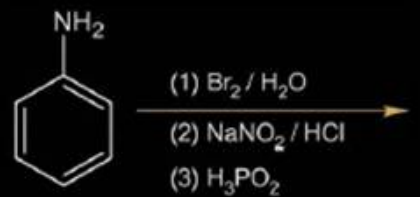
acidity B > C > A > D

pKa B < C < A < D

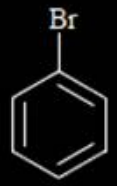
Question no. 60

AAYAM CAREER INSTITUTE

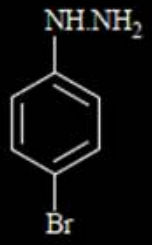
Identify the major product formed in the following sequence of reactions.



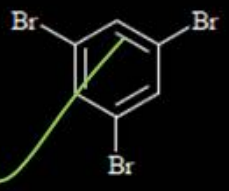
(1)



(2)

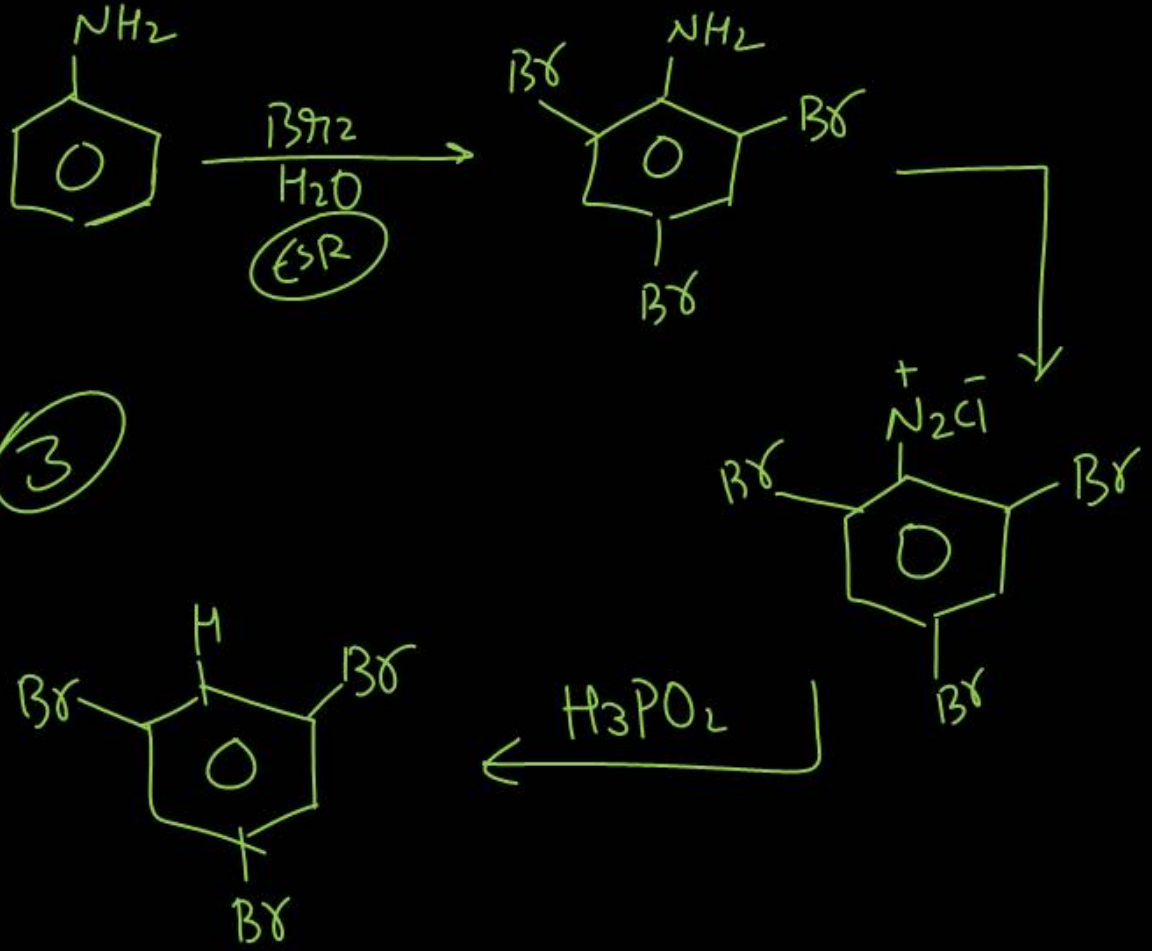


(3)



(4)

(3)

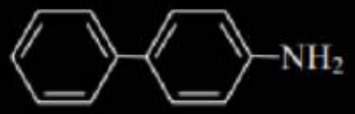


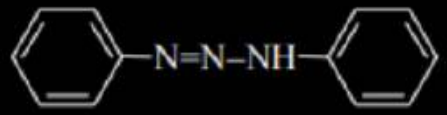
Question no. 61

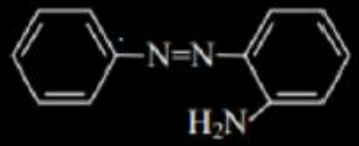
AAYAM CAREER INSTITUTE

Benzene diazonium chloride on reaction with aniline in the presence of dilute hydrochloric acid gives

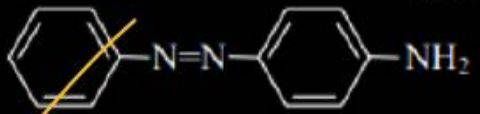
Coupling Rxn

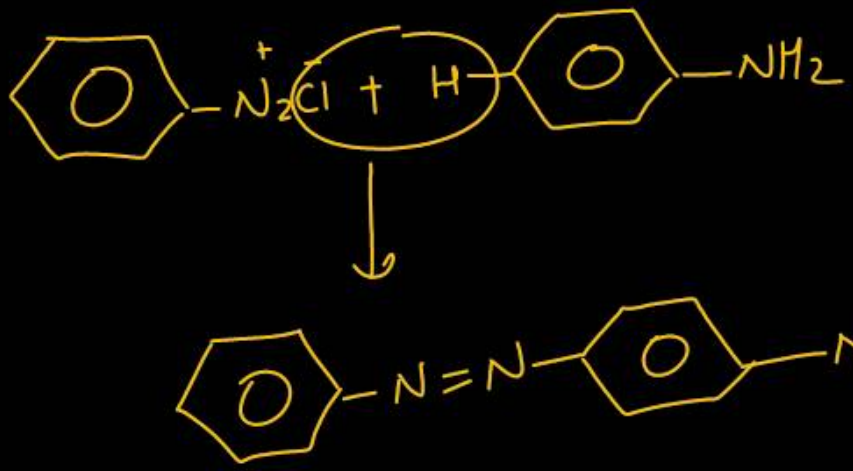
(1) 

(2) 

(3) 

4

(4) 



Question no. 62

AAYAM CAREER INSTITUTE

The correct structure of C is

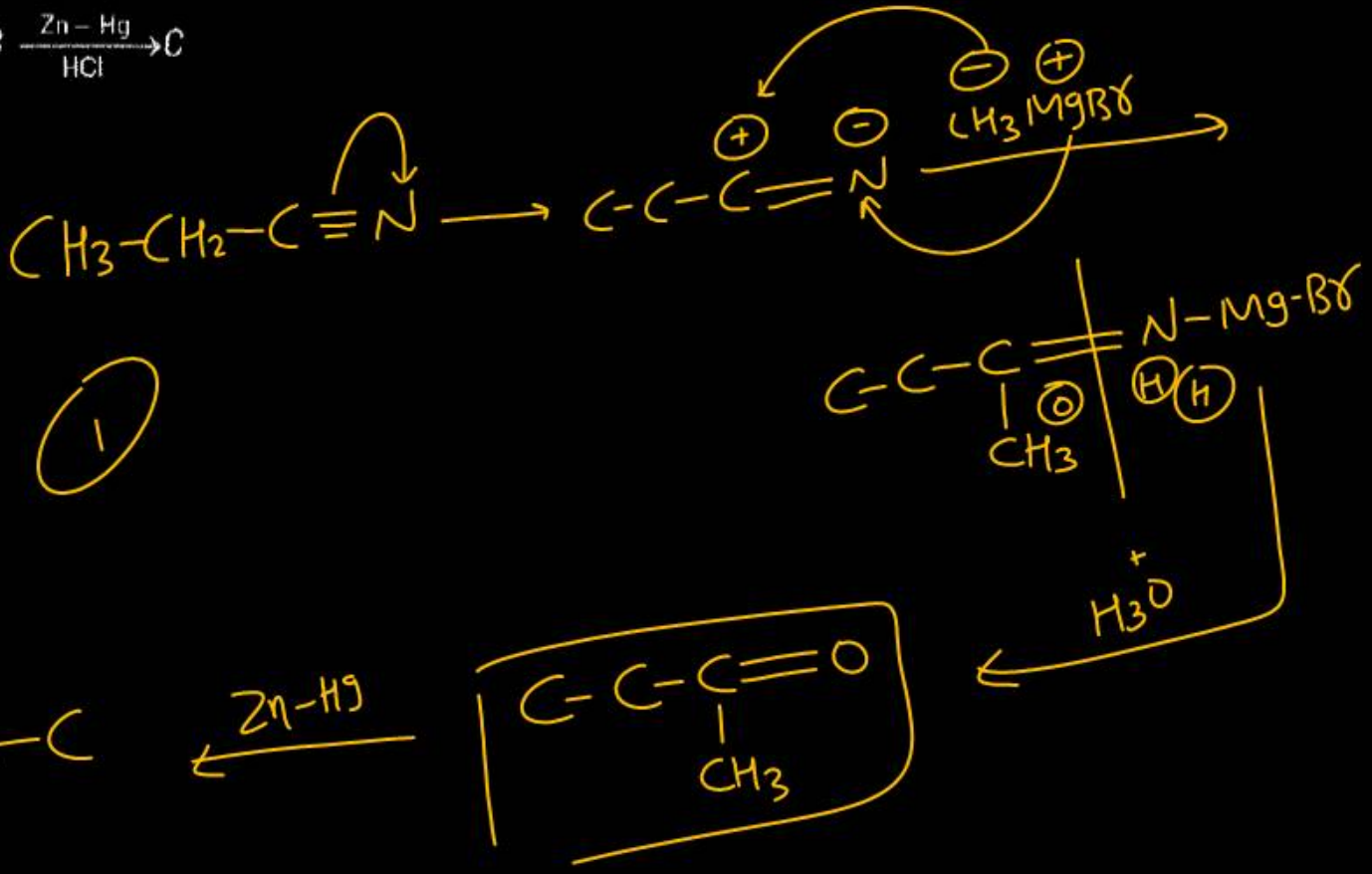
$CH_3-CH_2-C\equiv N \xrightarrow[\text{Ether}]{CH_3MgBr} A \xrightarrow{H_3O^+} B \xrightarrow[HCl]{Zn-Hg} C$

(1) $CH_3-CH_2-CH_2-CH_3$

(2) $CH_3-CH_2-\overset{\overset{O}{\|}}{C}-CH_3$

(3) $CH_3-CH_2-\underset{\underset{OH}{|}}{CH}-CH_3$

(4) $CH_3-CH_2-CH=CH_2$



Question no. 63

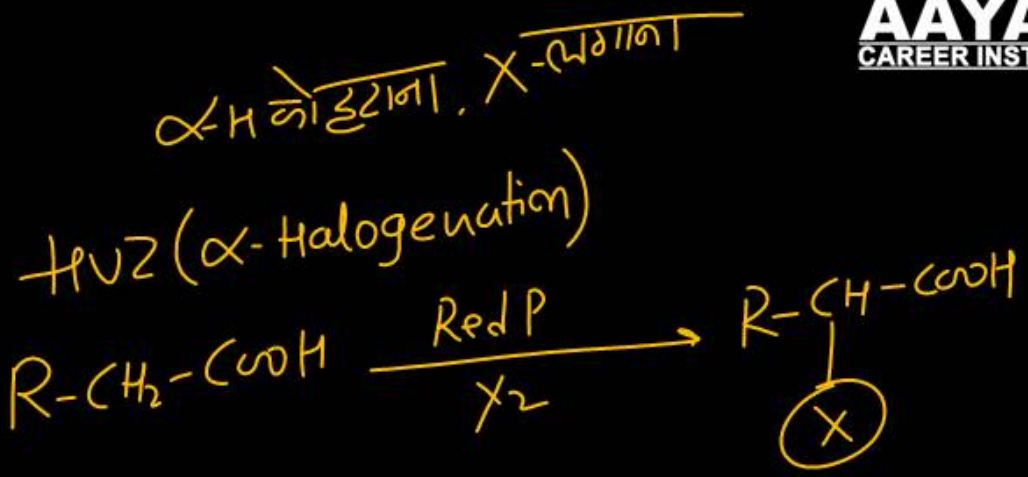
Which of the following will not undergo Hell-Volhard Zelinsky (HVZ) reaction?

(1) HCOOH

(2) CH_3COOH

(3) CH_3CH_2COOH

(4) $CH_3CHBrCOOH$



Question no. 64

AAYAM CAREER INSTITUTE

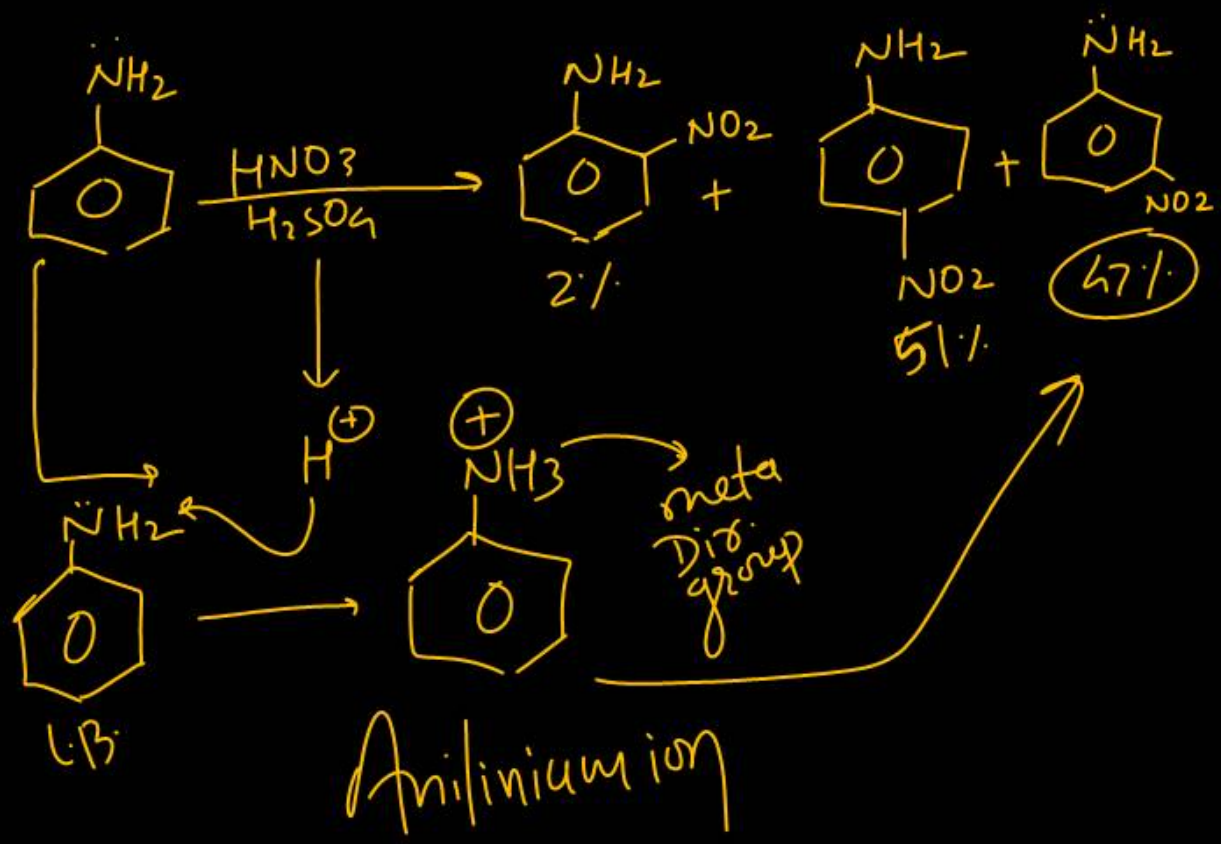
If aniline is treated with 1 : 1 mixture of conc. HNO_3 and conc. H_2SO_4, p-nitroaniline and m-nitroaniline are formed nearly in equal amounts. This is due to

(1) ~~m-directing property of $-NH_2$ group~~

(2) Protonation of $-NH_2$ which causes deactivation of benzene ring.

(3) ~~m and p directing property of $-NH_2$ group~~

(4) ~~Isomerisation of some p-nitroaniline into m-nitroaniline.~~



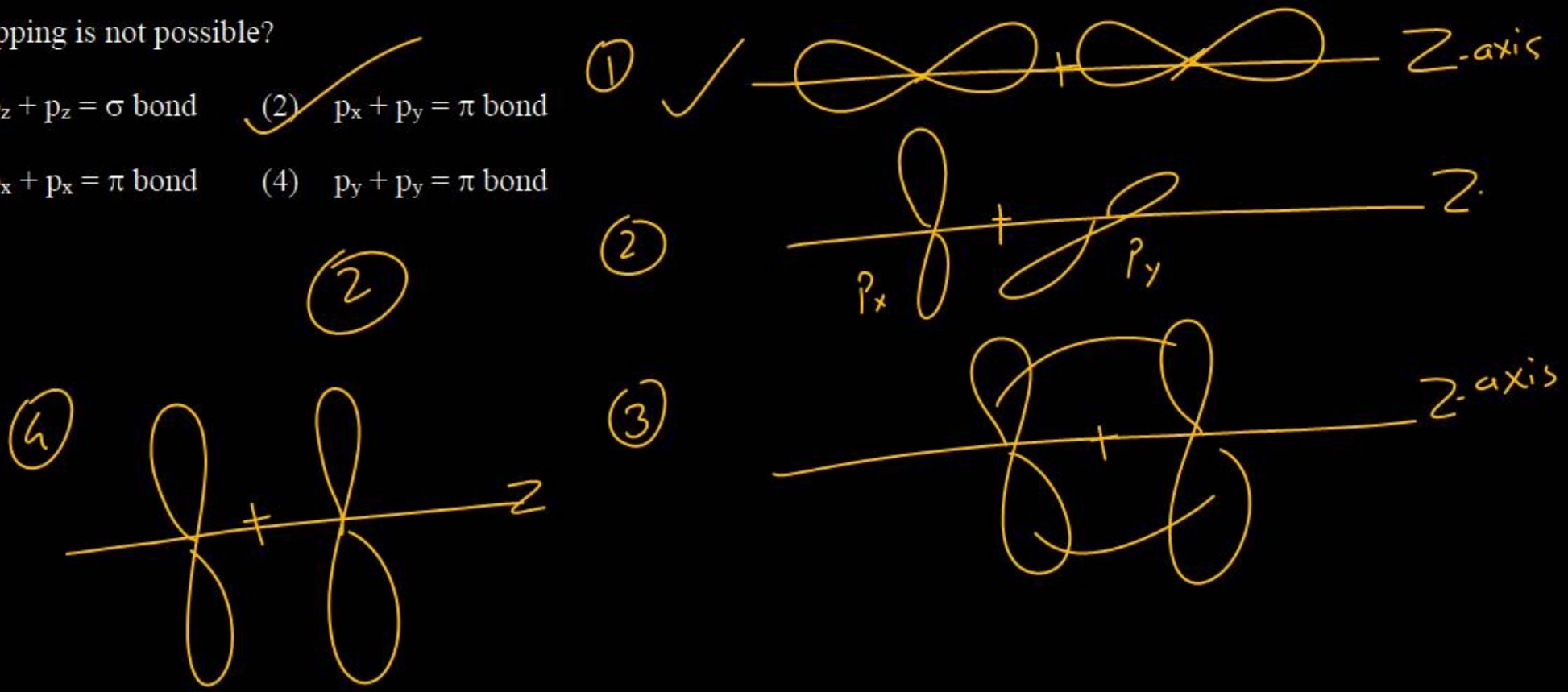
Question no. 65

AAYAM CAREER INSTITUTE

If the molecular axis is Z then which of the following overlapping is not possible?

(1) $p_z + p_z = \sigma$ bond (2) $p_x + p_y = \pi$ bond

(3) $p_x + p_x = \pi$ bond (4) $p_y + p_y = \pi$ bond



Question no. 66

AAYAM CAREER INSTITUTE

The hybridization of carbon atoms in $C_2 - C_3$ single bond of $\overset{4}{HC} \equiv \overset{3}{C} - \overset{2}{CH} = \overset{1}{CH_2}$ is :

(1) $sp^3 - sp^2$

(2) $sp^2 - sp$

(3) ~~$sp - sp^2$~~

(4) ~~$sp^3 - sp$~~

sp^2 (2)

sp

No. of σ bond + No. of lp

$= 2/sp$

$= 3/sp^2$

$= 4/sp^3$

Question no. 67

AAYAM CAREER INSTITUTE

What is the potential of half-cell consisting of zinc electrode in 0.01 M $ZnSO_4$ solution at 25°C.

$\left(E^{\circ}_{ox} = 0.763V\right)$

(1) 0.8221 V (2) 8.221 V

(3) 0.5282 V (4) 9.282 V

$ZnSO_4 \longrightarrow Zn^{+2} + SO_4^{-2}$

$n = 2$

$Zn^{+2} = 0.01 = 10^{-2}$

$$E_{oxi}^{cell} = E^{\circ}_{oxi}{}^{cell} + \frac{0.059}{n}\log_{10}\frac{P}{R}$$

$$= 0.763 + \frac{0.059}{2}\log_{10}\frac{1}{10^{-2}}$$

$$= 0.763 + \frac{0.059}{2}\log 10^{2}$$

$$= 0.763 + \frac{0.059}{2} \times 2 \log 10$$

$\log 10 \rightarrow 1$

$E_{cell} = 0.763 + 0.059$

$= 0.822$

$\boxed{E_{cell} = 0.822}$

Question no. 68

Equal masses of H_2, O_2 and methane have been taken in container of volume V at temperature 27°C in identical conditions. The ratio of the volumes of gases $H_2 : O_2$: methane would be

(1) 8 : 16 : 1 (2) 16 : 8 : 1

(3) 16 : 1 : 2 (4) 8 : 1 : 2

$mol = \frac{w}{M_w}$ mol Ratio : Volume Ratio

let wt = x gm

$\frac{x}{2} : \frac{x}{32} : \frac{x}{16}$

H_2 O_2 CH_4

16 : 1 : 2

Question no. 69

AAYAM CAREER INSTITUTE

The increasing order of the rate of HCN addition to compounds A-D is

(NAR ∝ +ve charge on sp^2-C / Steric Hindrance Reactivity)

A. HCHO

B. CH_3COCH_3

C. $PhCOCH_3$

D. PhCOPh

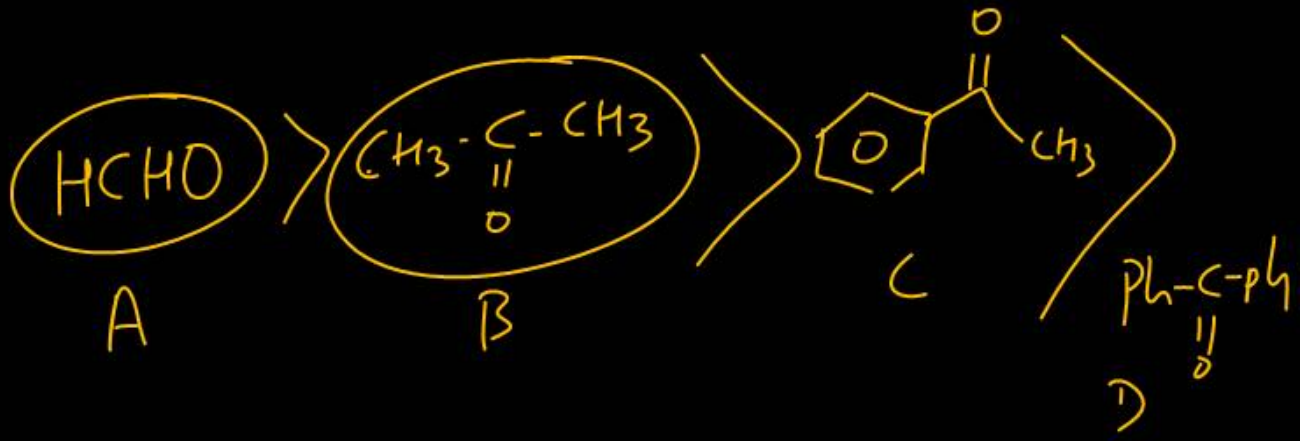
(1) A < B < C < D

(2) D < B < C < A

(3) D < C < B < A

(4) C < D < B < A

3



Question no. 70

AAYAM CAREER INSTITUTE

Phenyl magnesium bromide reacts with methanol to give.

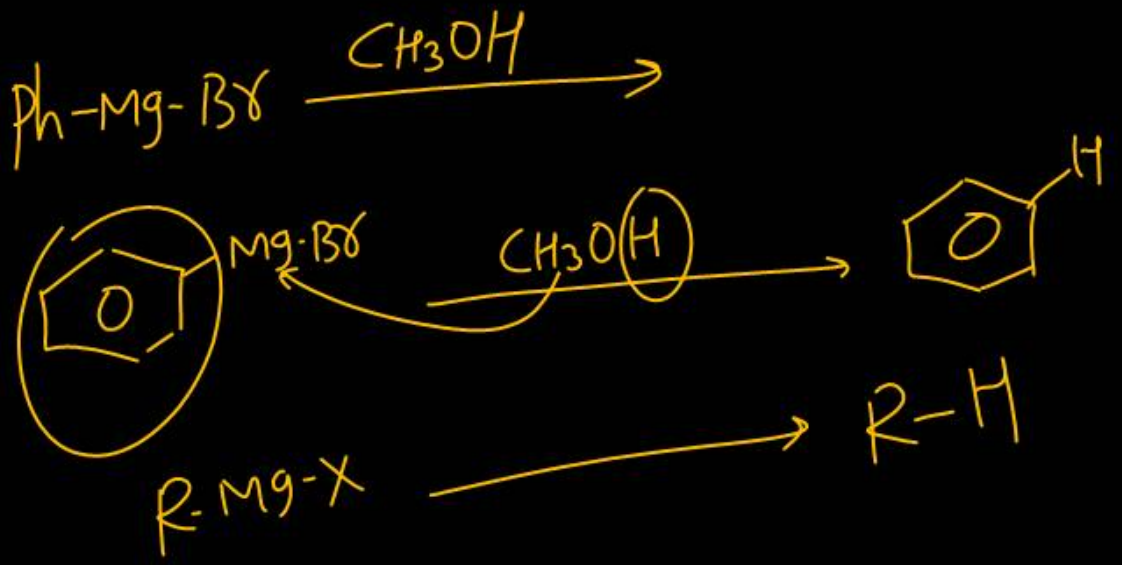
(1) a mixture of anisole and Mg(OH)Br

(2) a mixture of benzene and Mg(OMe)Br

(3) a mixture of toluene and Mg(OH)Br

(4) a mixture of phenol and Mg(Me)Br

2



Question no. 71

AAYAM CAREER INSTITUTE

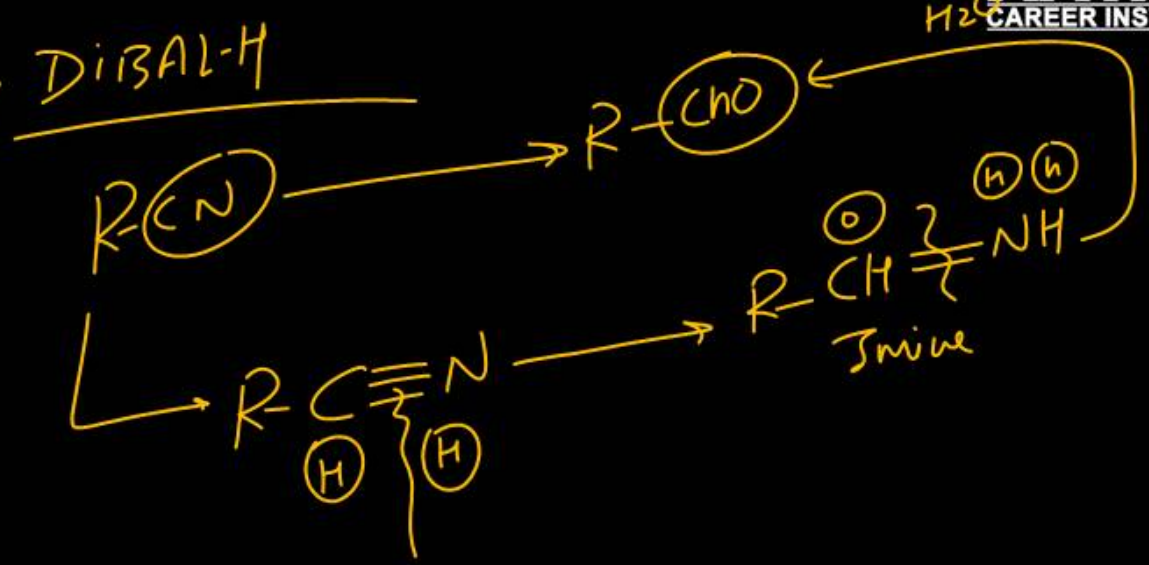
The major product of following reaction is

$$R-C\equiv N \xrightarrow[H_2O]{AlH(i-Bu)_2} ?$$

(1) RCHO (2) $RCONH_2$

(3) RCOOH (4) RCH_2NH_2

(1)



Question no. 72

AAYAM CAREER INSTITUTE

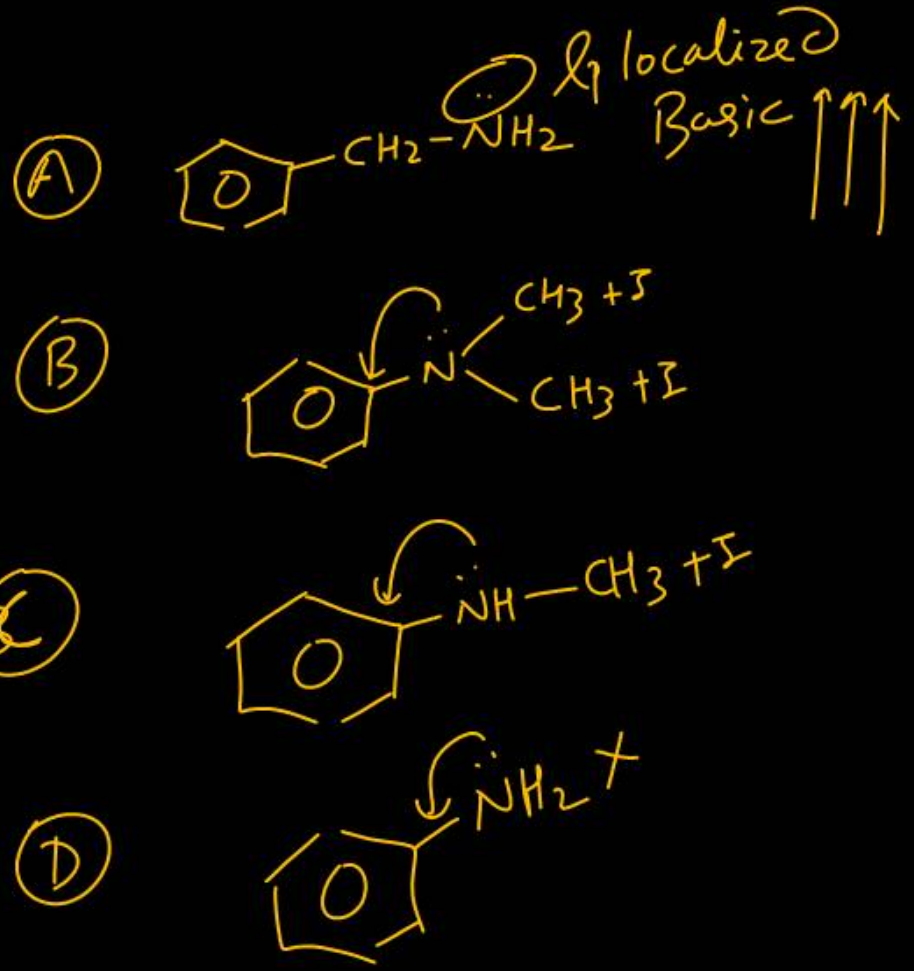
For the following amines what will be the correct order for basicity.

A. phenyl methanamine B. N, N-dimethylaniline

C. N-methyl aniline D. Benzenamine

(1) A > C > B > D (2) ~~D > C > B > A~~

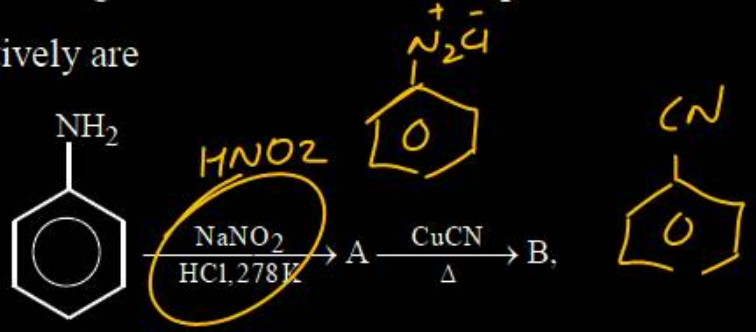
(3) ~~D > B > C > A~~ (4) A > B > C > D



Question no. 73

AAYAM CAREER INSTITUTE

In the following chemical reaction, compounds A and B respectively are



(1) fluorobenzene and phenol

(2) benzene diazonium chloride and benzonitrile

(3) nitrobenzene and chlorobenzene

(4) phenol and bromobenzene

Question no. 74

Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).

Assertion (A) : Synthesis of ethyl phenyl ether may be achieved by Williamson synthesis.

Reason (R) : Reaction of bromobenzene with sodium ethoxide yields ethyl phenyl ether.

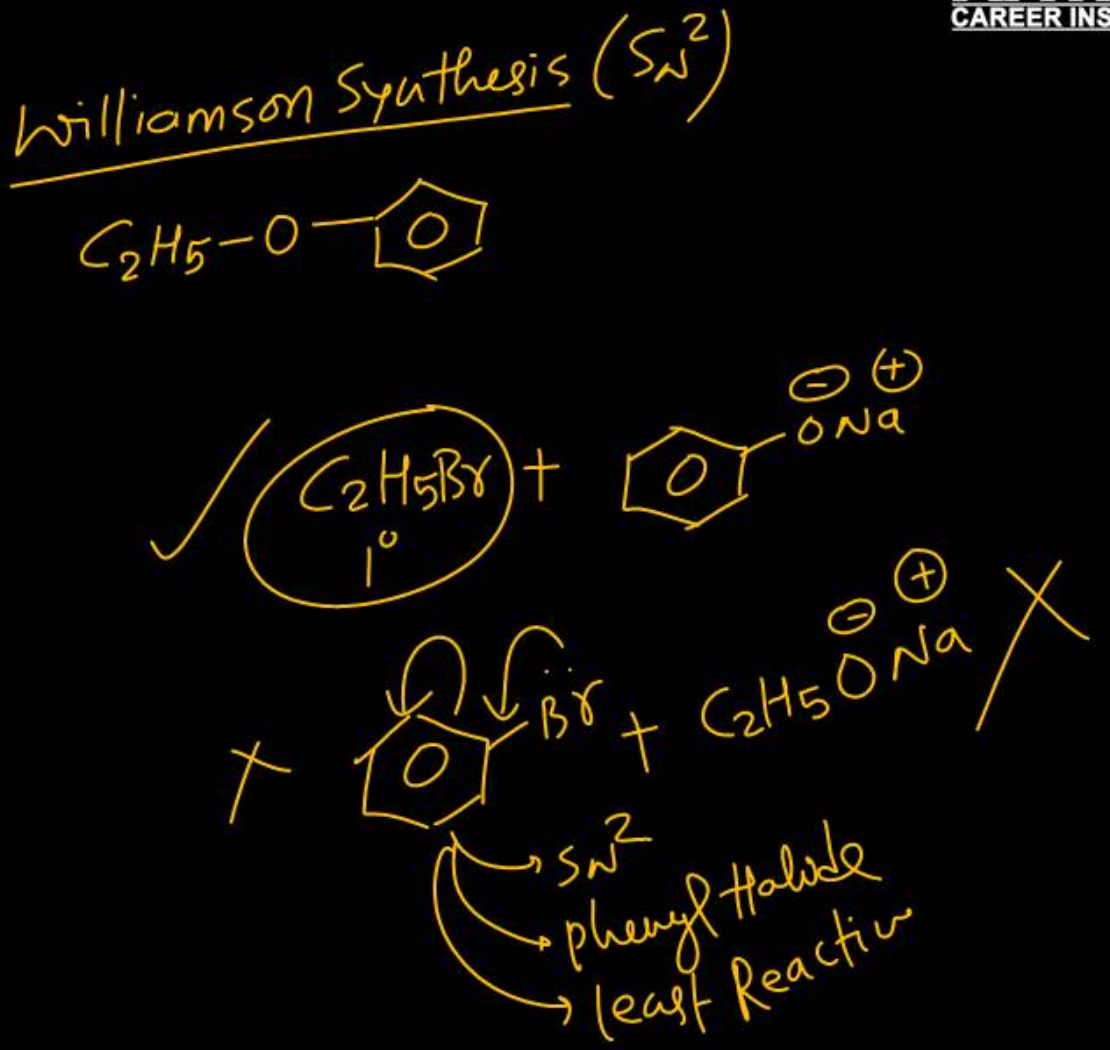
In the light of the above statements, choose the correct answer from the options given below.

(1) Both (A) and (R) true but (R) is not the correct explanation of (A).

(2) (A) is true but (R) is false.

(3) (A) is false but (R) is true.

(4) Both (A) and (R) true but (R) is correct explanation of (A).



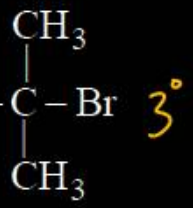
Question no. 75

AAYAM CAREER INSTITUTE

Which of the following compound most reactive for

S_N2 reaction?

(1) $CH_3-CH_2-CH_2-Br$ 1°

(2)  3°

(3) $CH_3-CH-CH_2-Br$ 1°

(4) CH_3-CH_2-Br 1°

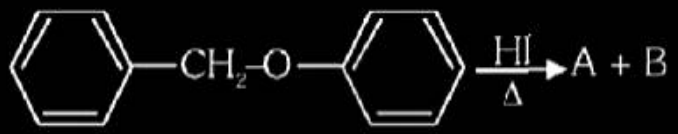
S_N2 Reactivity $\propto \frac{1}{\text{Steric Hindrance}}$

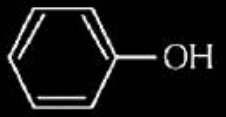
4

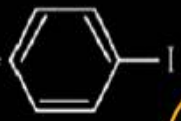
Question no. 76

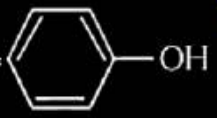
AAYAM CAREER INSTITUTE

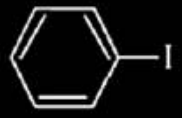
Consider the following reaction and Identify products A and B.



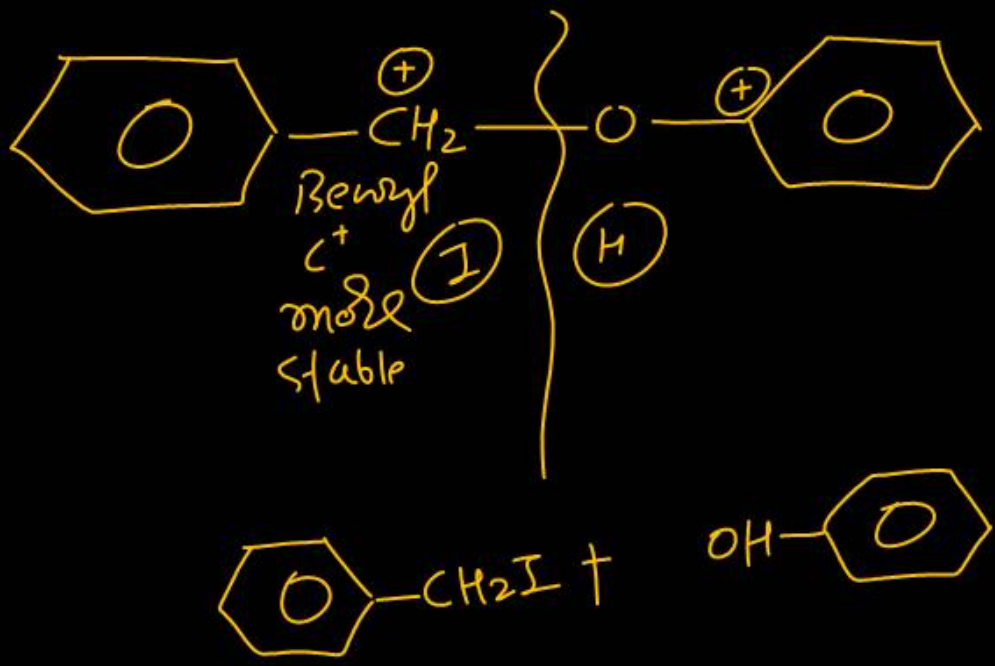
(1) A =  and B = 

(2) A =  and B = 

(3) A =  and B = 

(4) A =  and B = 

3



Question no. 77

AAYAM CAREER INSTITUTE

The term invert sugar refers to an equimolar mixture of :

(1) D–glucose and D–galactose

(2) D–glucose and D–fructose

(3) D–glucose and D–mannose

(4) D–glucose and D–ribose

Sucrose → D(+) glucose + D(−) fructose

(2)

Question no. 78

AAYAM CAREER INSTITUTE

Which pair of ions has the same shape?

(1) CO_3^{2-} and NO_3^- (2) CO_3^{2-} and SO_3^{2-}

(3) NO_3^- and ClO_3^- (4) CO_3^{2-} and ClO_3^-

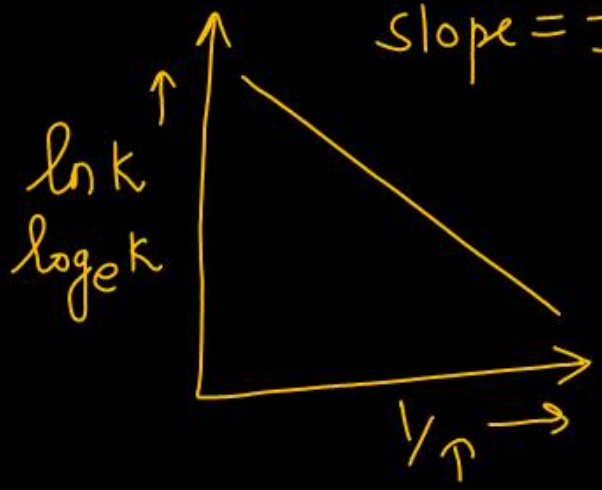
1

Question no. 79

In the Arrhenius plot of $\ell n\ k$ vs $\frac{1}{T}$, a linear plot is obtained with a slope of -2×10^4 K. The energy of activation of the reaction (in kJ mol^{-1}) is

(1) 83 (2) 166

(3) 249 (4) 332



$$\text{slope} = -\frac{E_a}{R}$$

$$\pm 2 \times 10^4 = \pm \frac{E_a}{R} \quad [R = 8.314]$$

$$E_a = 2 \times 10^4 \times R$$

$$E_a = 2 \times 10^4 \times 8.314 \text{ Joule}$$

$$= 16.628 \times 10^4 \text{ J}$$

$$E_a = 16.6 \times 10 \text{ kJ}$$

$$= 166 \text{ kJ/mol}$$

Question no. 80

AAYAM CAREER INSTITUTE

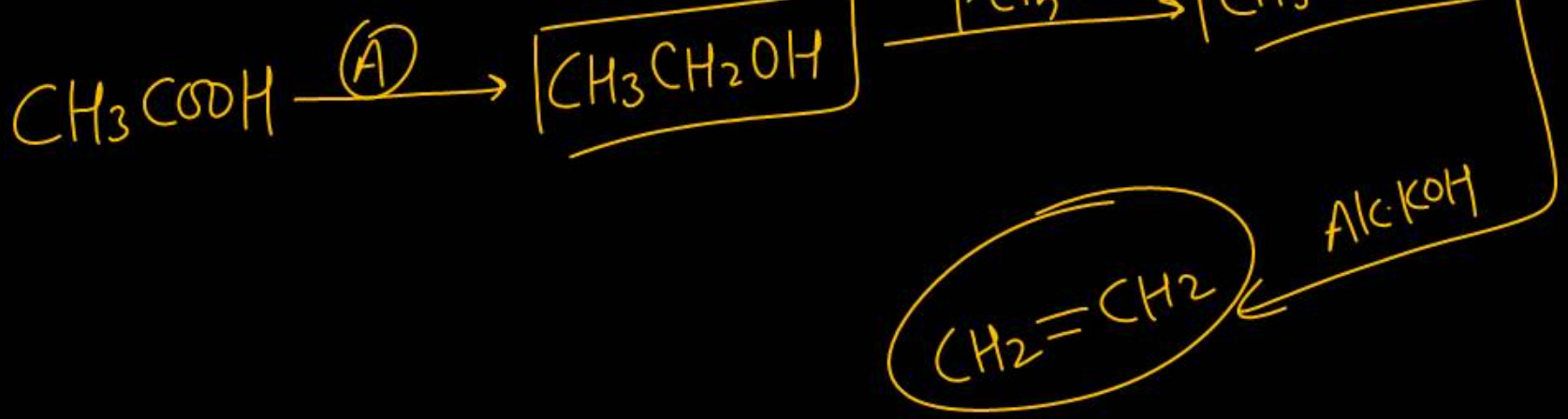
In the following reaction product C will be–

$$CH_3COOH \xrightarrow{LiAlH_4} A \xrightarrow{PCl_5} B \xrightarrow{alc.KOH} C$$

(1) acetaldehyde (2) acetylene

(3) ethylene (4) acetylchoride

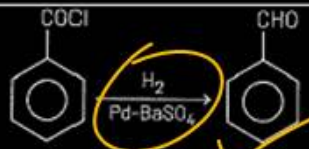
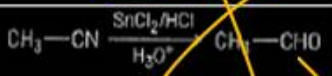
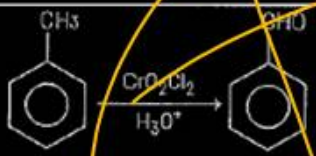
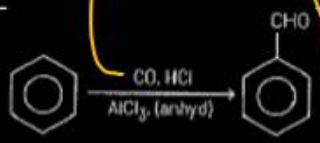
3



Question no. 81

AAYAM CAREER INSTITUTE

Match List I with List II.

	List I		List II
A.		i.	Gattermann Koch reaction
B.		ii.	Etard reaction
C.		iii.	Stephen reaction
D.		iv.	Rosenmund reaction

Choose the correct answer from the options given below.

(1) A – iv, B – iii, C – ii, D – i

(2) ~~A – i, B – ii, C – iii, D – iv~~

(3) ~~A – ii, B – iii, C – iv, D – i~~

(4) ~~A – iii, B – ii, C – i, D – iv~~

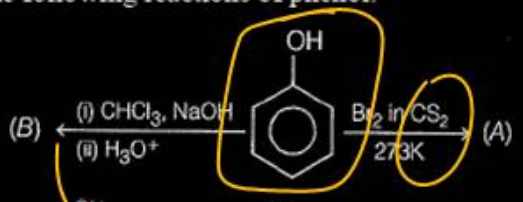
A - iv
B - iii
C - ii
D - i

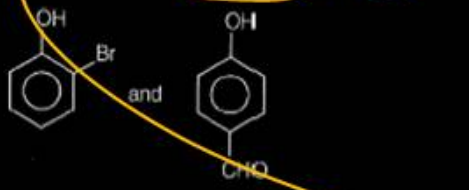
(1)

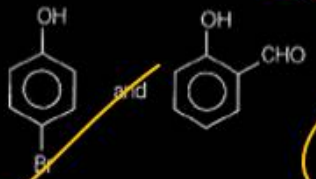
Question no. 82

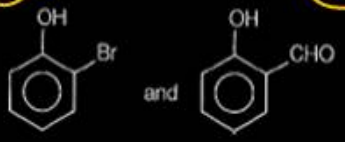
AAYAM CAREER INSTITUTE

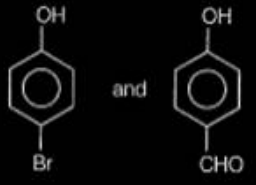
Identify the major products A and B respectively in the following reactions of phenol.

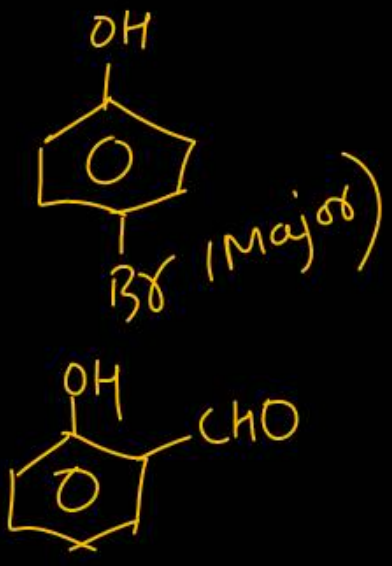


(1) 

(2) 

(3) 

(4) 



Question no. 83

Given below are two statements, one is labelled as Assertion (A) and other is labelled as Reason (R).

Assertion (A): Gabriel phthalimide synthesis can not be used to prepare aromatic primary amines.

Reason (R): Aryl halides do not undergo nucleophilic substitution reaction.

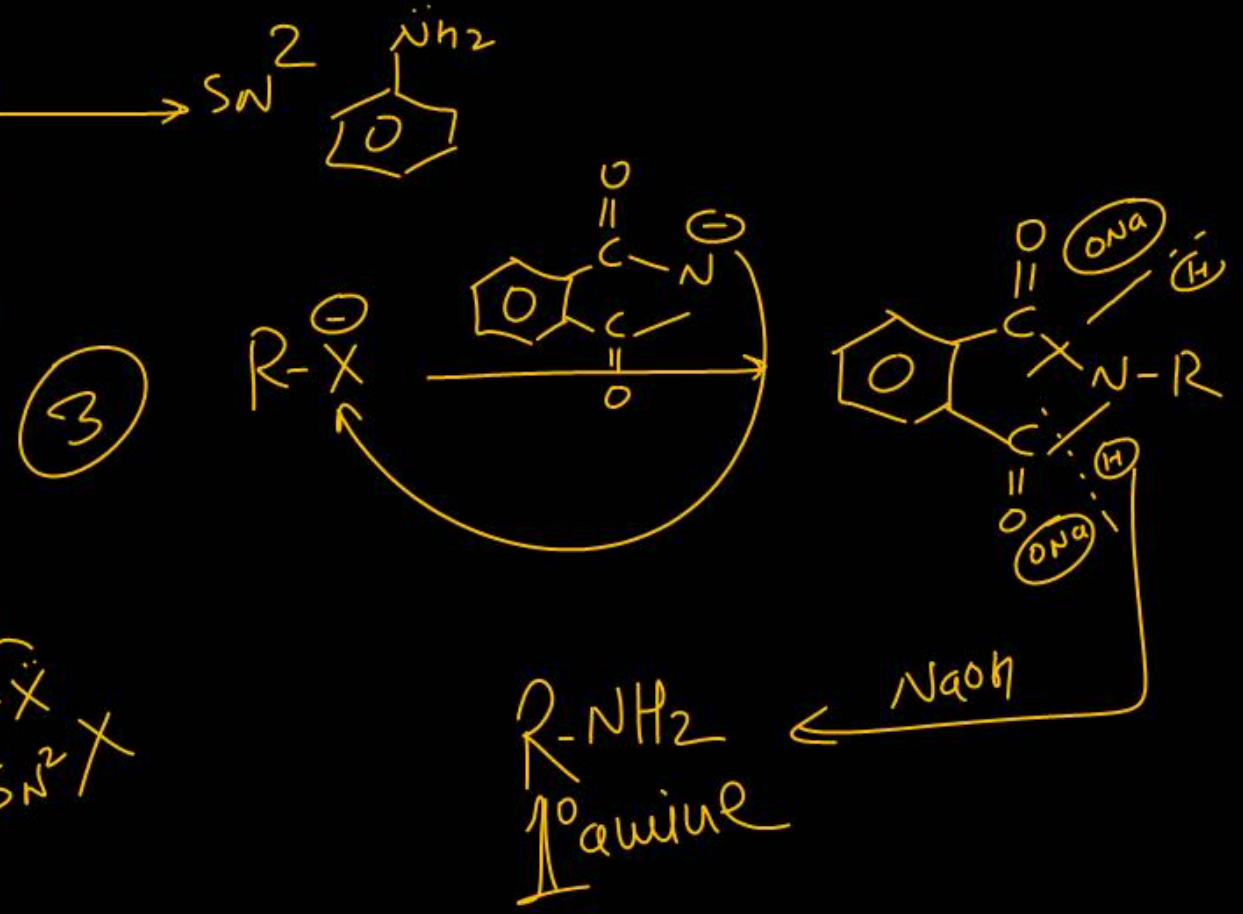
In the light of the above statements, choose the correct answer from the options given below.

(1) Both (A) and (R) true but (R) is not the correct explanation of (A).

(2) (A) is false but (R) is true.

(3) Both (A) and (R) true but (R) is correct explanation of (A).

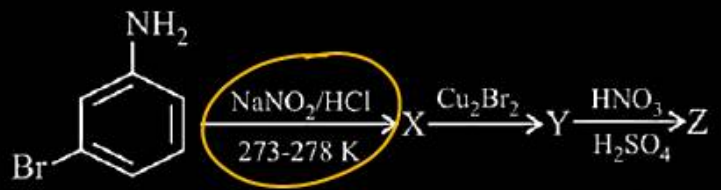
(4) (A) is true but (R) is false.

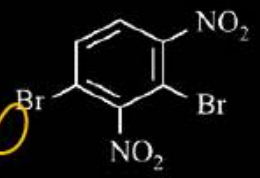


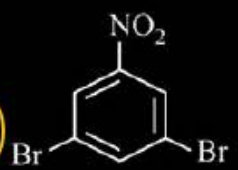
Question no. 84

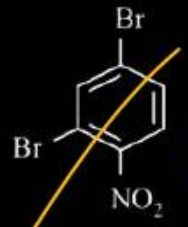
AAYAM CAREER INSTITUTE

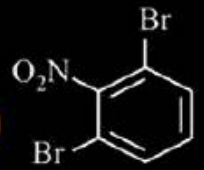
The major product Z obtained in the following reaction scheme is

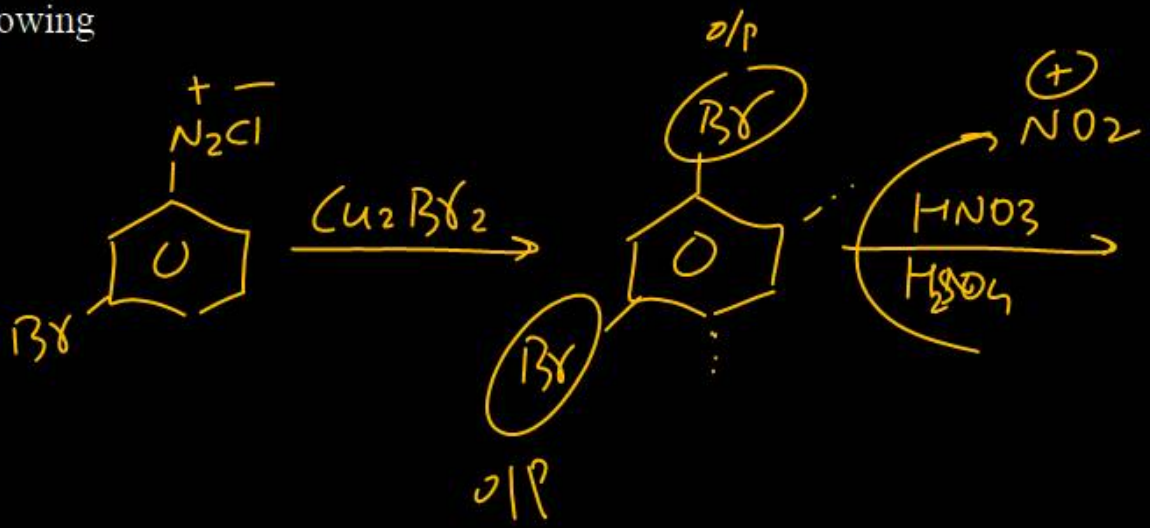


(1) 

(2) 

(3) 

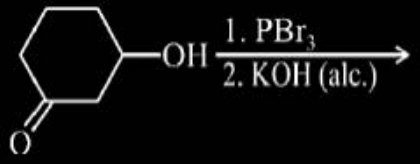
(4) 

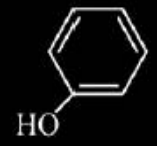


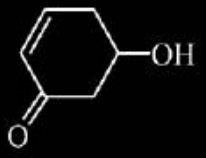
Question no. 85

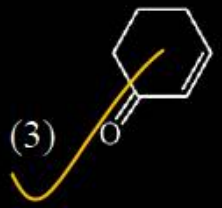
AAYAM CAREER INSTITUTE

The major product of the following reaction is

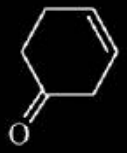


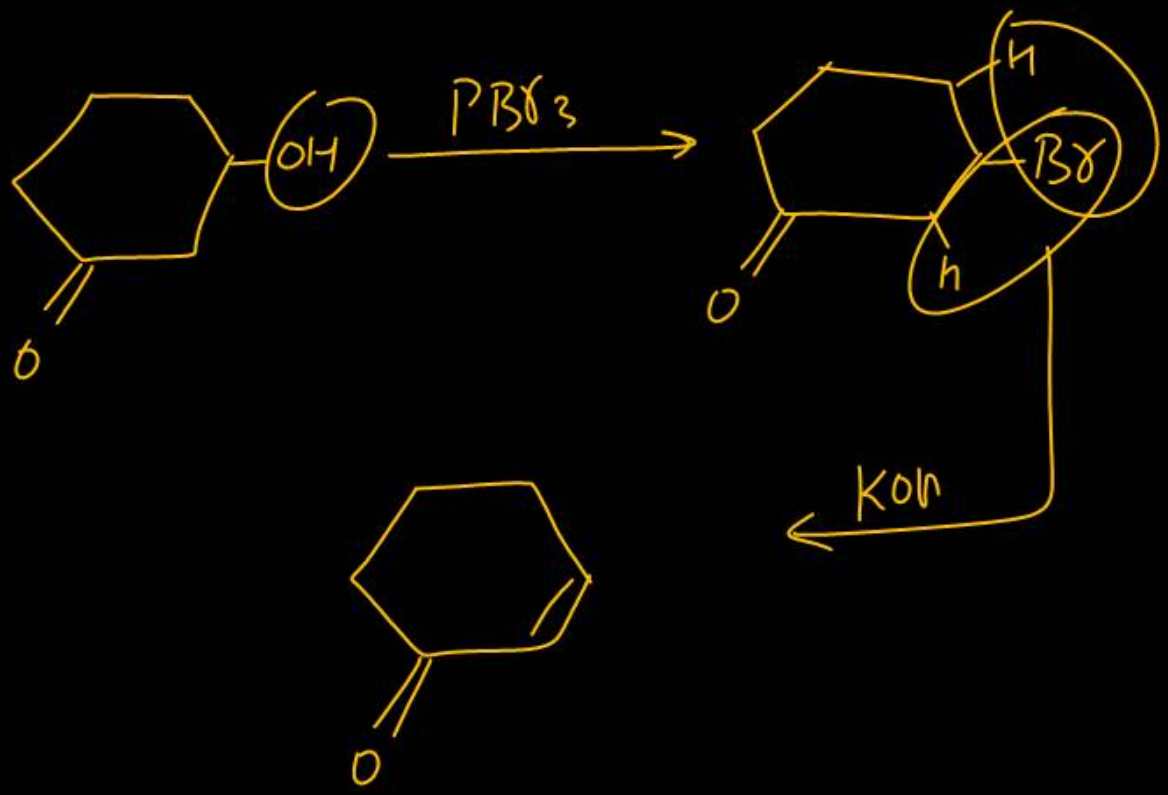
(1) 

(2) 

(3) 

3

(4) 



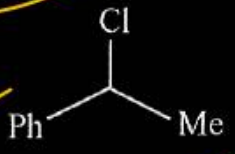
Question no. 86

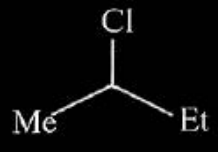
AAYAM CAREER INSTITUTE

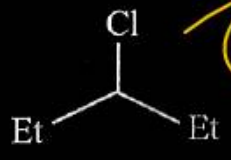
Which is most reactive for S_N1 reaction–

$\propto$ stability of $C^{\oplus}$

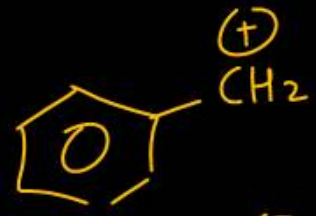
(1) 

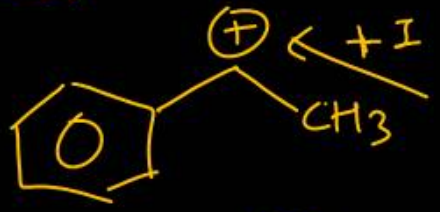
(2) 

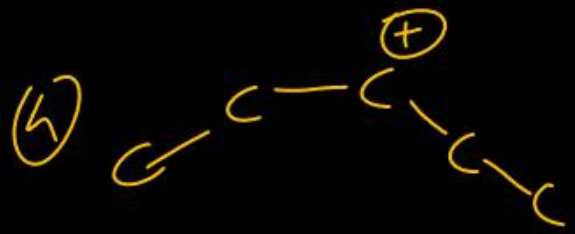
(3) 

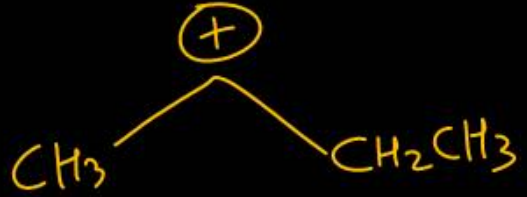
(4) 

2

1 

2 

4 

3 

Question no. 87

AAYAM CAREER INSTITUTE

Given below are two statements:

Statements I : In Lucas test, primary, secondary and tertiary alcohols are distinguished on the basis of their reactivity with conc. $HCl + ZnCl_2$, known as Lucas reagent.

Statement II : Primary alcohols are most reactive and immediately produce turbidity at room temperature on reaction with Lucas reagent.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct, but Statement II is incorrect.

(2) Statement I is incorrect, but Statement II is correct.

(3) Both Statement I and Statement II are correct.

(4) Both Statement I and Statement II are incorrect.

Lucas Rx ∝ Stability of $C^{\oplus}$

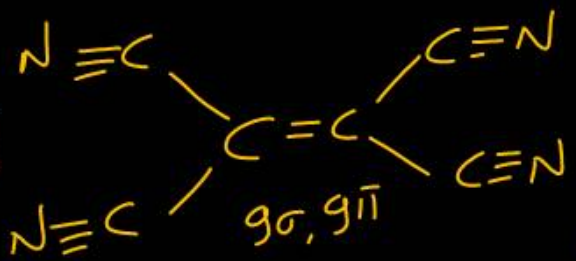
Reactivity

3° alc. > 2° alc. > 1° alc.

Question no. 88

AAYAM CAREER INSTITUTE

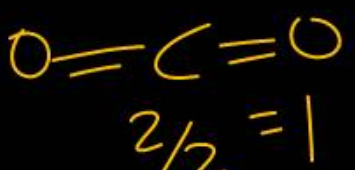
A : tetracyanomethane $\left[C_2(CN)_4\right]$



$9\sigma, 9\pi$

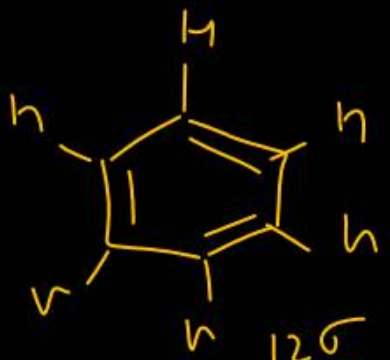
$\frac{9\sigma}{9\pi} = 1$

B : carbon dioxide



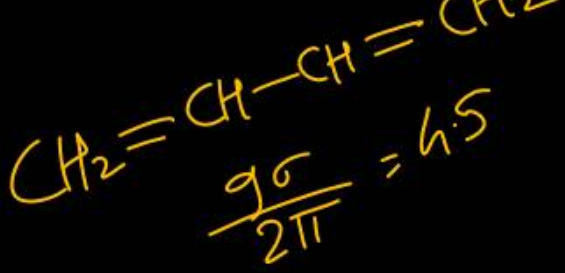
$\frac{2}{2} = 1$

C : benzene



$\frac{12\sigma}{3\pi} = 4:1$

D : 1, 3-buta-diene



$\frac{9\sigma}{2\pi} = 4.5$

For above molecules ratio of σ and π bonds is in the order :

(1) $A = B < C < D$ (2) $A = B < D < C$

(3) $A = B = C = D$ (4) $C < D < A < B$

(1)

Question no. 89

AAYAM CAREER INSTITUTE

What is the formal charge on the central Nitrogen atom in N_2O?

(1) +1
(2) 0
(3) −1
(4) −2

1

$$FC = [\text{No. of valence } e^- \text{ in free state}] - [2 \times lp] - [\text{No. of bonds formed by that atom}]$$

$5 - (2 \times 0) - 4$

$5 - 4 = +1$

Question no. 90

AAYAM CAREER INSTITUTE

For the following reaction

$NO_2(g) + CO(g) \rightarrow NO(g) + CO_2(g)$

the rate law is: Rate = k $[NO_2]^2$.

If 0.1 mole of gaseous carbon monoxide is added at constant temperature to the reaction mixture which of the following statements is true?

(1) Both k and the reaction rate remain the same.

(2) Both k and the reaction rate increase

(3) Both k and the reaction rate decrease

(4) Only k incrases, the reaction rate remain the same.

$Rate = k[NO_2]^2$

CO → Absent

↳ order = zero order

Question no. 91

AAYAM CAREER INSTITUTE

How many divisions are required for formation of 3-celled mature male gametophyte from pollen mother cell?

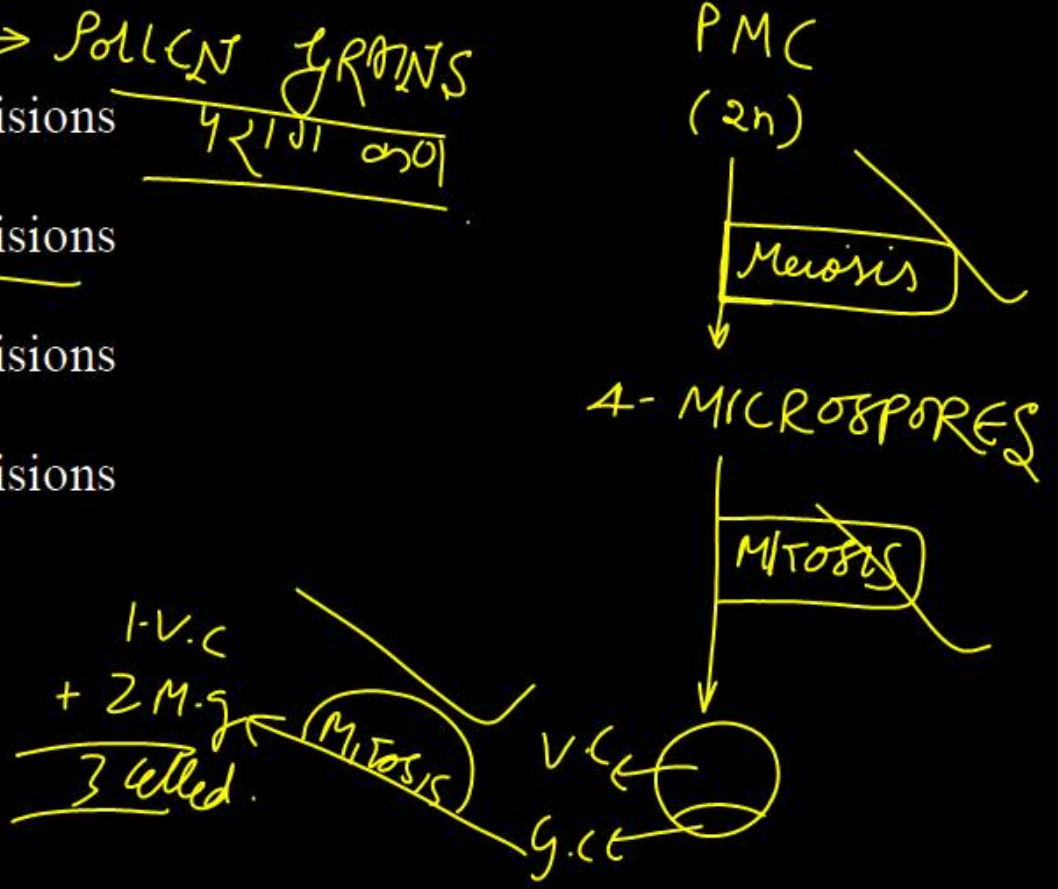
→ POLLEN GRAINS परागकण

(1) 2 meiotic and 2 mitotic divisions

(2) 1 meiotic and 2 mitotic divisions

(3) 1 meiotic and 3 mitotic divisions

(4) 1 meiotic and 1 mitotic divisions



Question no. 92

AAYAM CAREER INSTITUTE

Transfer of pollen grains from the anther to the stigma of another flower of the same plant is

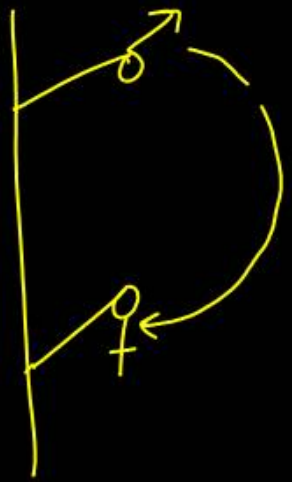
(1) Ecologically cross pollination

(2) Functionally self pollination

(3) Genetically cross pollination

(4) Ecologically self pollination

परागण



GEITONOGAMY

Question no. 93

AAYAM CAREER INSTITUTE

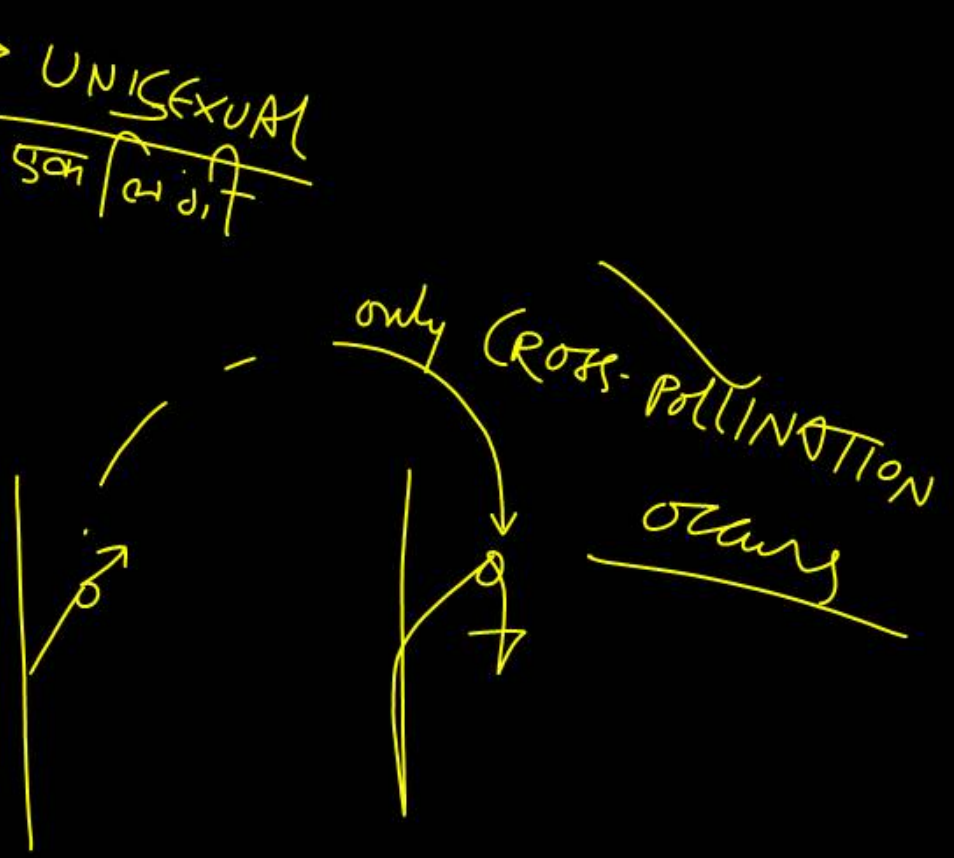
Dioecious plants prevent

(1) Both autogamy and geitonogamy

(2) Autogamy but geitonogamy

(3) Geitonogamy but not autogamy

(4) Neither autogamy nor geitonogamy



Question no. 94

AAYAM CAREER INSTITUTE

The coconut water from tender coconut represents:

(1) Free nuclear endosperm

(2) Free nuclear endocarp

(3) Free nuclear embryo

(4) Free nuclear perisperm

Question no. 95

AAYAM CAREER INSTITUTE

How many of the following have albuminous seeds?

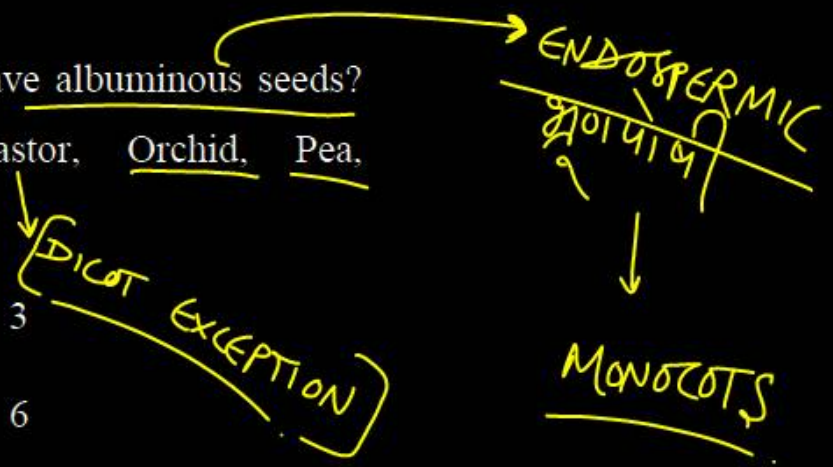
Wheat, Maize, Barley, Castor, Orchid, Pea, Groundnut.

(1) 2

(2) 3

(3) 4

(4) 6



Question no. 96

AAYAM CAREER INSTITUTE

Read the following statements w.r.t pollen grain and select the correct option.

(a) Exine is rough, hard and made up of sporopollenin.

(b) Intine is thin and made up of pecto-cellulose.

(c) Exine has prominent apertures called germ pores where sporopollenin is absent.

(d) Vegetative cell undergo mitosis to form two male gametes.

(e) In majority of flowering plants, pollination occurs at 3-celled stage.

How many statements are correct?

(1) Two (2) Three

(3) Four (4) Five

Question no. 97

AAYAM CAREER INSTITUTE

Given below are two statements:

Statements I : Cleistogamous flowers are invariably autogamous.

Statement II : Cleistogamy is disadvantageous as there is no chance for cross-pollination.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Statement I is correct, but Statement II is incorrect.

(2) Statement I is incorrect, but Statement II is correct.

(3) Both Statement I and Statement II are correct.

(4) Both Statement I and Statement II are incorrect.

Question no. 98

In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are

(1) Antipodals, synergids and primary endosperm nucleus.

(2) Synergids, zygote and primary endosperm nucleus.

(3) Synergids, antipodals and polar nuclei

(4) Synergids, primary endosperm nucleus and zygote.

Question no. 99

AAYAM CAREER INSTITUTE

The plant parts which consist of two generations one within the other:

A. Pollen grains inside the anther.

B. Germinated pollen grain with two male gametes.

C. Seed inside the fruit.

D. Embryo sac inside the ovule.

(1) A only

(2) A, B and C

(3) C and D

(4) A and D

Question no. 100

AAYAM CAREER INSTITUTE

Endosperm is the product of triple fusion. The function of endosperm is :

(1) To provide nutrition to developing microspores.

(2) To provide nutrition to developing embryo.

(3) To protect egg cell.

(4) To form protecting covering of embryo.

Question no. 101

AAYAM CAREER INSTITUTE

Double fertilization involves.

(1) One male gamete, one female gamete and two polar nuclei.

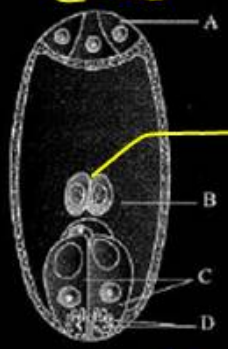
(2) Two male gametes, two female gametes and one polar nuclei.

(3) One male gamete and two polar nuclei only.

(4) Two male gametes, two polar nuclei and one female gamete.

Question no. 102

Given below is the diagrammatic representation of embryo sac. Identify the parts labelled A, B, C and D and select the correct option.



(1) A – Antipodals, B – Central cell, C – Synergids, D – Obturator.

(2) A – Antipodals, B – Polar nuclei, C – Synergids, D – Filiform apparatus.

(3) A – Antipodals, B – Central cell, C – Synergids, D – Filiform apparatus.

(4) A – Synergids, B – Polar nuclei, C – Antipodals, D – Obturator.

Question no. 103

AAYAM CAREER INSTITUTE

The ovule in an angiosperm is equivalent to

(1) A megasporangium

(2) A megasporophyll

(3) Female gametophyte

(4) Female gamete

Question no. 104

AAYAM CAREER INSTITUTE

Which structure of pollen grains help in their fossilization?

(1) Intine
(2) Exine
(3) Germ pores
(4) Cell membrane

SPOROPOLLENIN

Question no. 105

AAYAM CAREER INSTITUTE

Chasmo-cleistogamous flowers is/are found in

(a) Viola (common pansy)

(b) Oxalis

(c) Commelina

(1) a only

(2) b and c only

(3) a and c only

(4) a, b and c

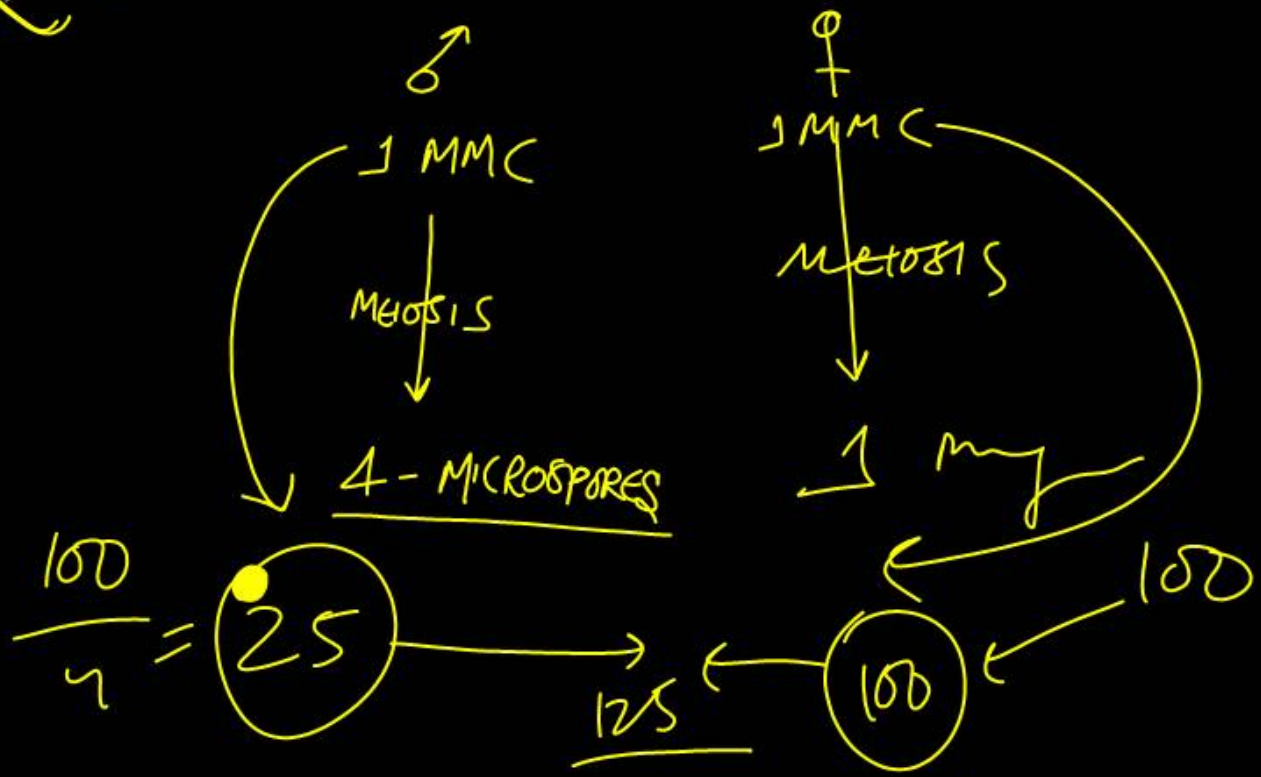
Question no. 106

AAYAM CAREER INSTITUTE

How many meiosis are required for the formation of 100 grains of wheat?

(1) 100 (2) 200

(3) 150 (4) 125



Question no. 107

AAYAM CAREER INSTITUTE

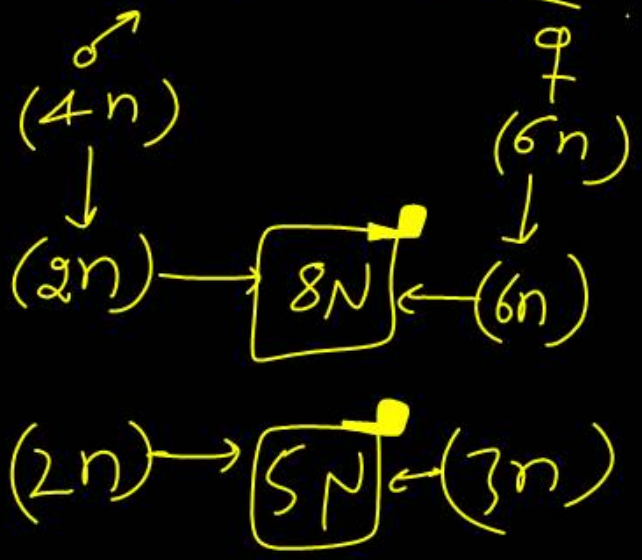
What will be the ploidy of endosperm and zygote if the cross is made between 6n female plant and 4n male plant?

(1) 5n, 8n
(2) 8n, 5n
(3) 10n, 7n
(4) 6n, 4n

Normal condition में :-

	♂ (2n)	♀ (2n)
ENDOSPERM	n	2n
ZYGOTE	n	n

In QUESTION



Question no. 108

AAYAM CAREER INSTITUTE

Scutellum is a प्रशल्क

(1) Endosperm of gymnosperm

(2) Shield shaped cotyledon of monocot

(3) Protective convering of radicle

(4) Protective covering of plumule

Question no. 109

AAYAM CAREER INSTITUTE

Which of the following is a marine water pollinated plant?

(1) Vallisneria
(2) Hydrilla
(3) Water hyacinth
(4) Zostera

SEA GRASS

Question no. 110

AAYAM CAREER INSTITUTE

Wind pollinated flowers are

(1) Small, brightly coloured, producing large number of pollen grains

(2) Small, producing large number of dry pollens

(3) Large, producing abundant nectar and pollens

(4) Small, producing nectar and dry pollens

Question no. 111

AAYAM CAREER INSTITUTE

Pith is well developed in

A. Monocot root
B. Dicot root
C. Monocot stem
D. Dicot stem

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

Question no. 112

AAYAM CAREER INSTITUTE

A student is provided with a section of root. He needs to identify whether the section is of a dicot root or monocot root. Which of the following feature can help him?

(1) Presence of exarch xylem shows it is a dicot root section

(2) Presence of polyarch xylem shows it is a monocot root section

(3) Presence of radial vascular bundles shows it is a monocot root section

(4) Presence of well–developed pith at center shows it is a dicot root section

Question no. 113

AAYAM CAREER INSTITUTE

Barrel–shaped cells with suberized Casparian strips are seen in

(1) Endodermis of dicot stem

(2) Epidermis of dicot stem

(3) Endodermis of dicot root

(4) Epidermis of monocot root

Question no. 114

AAYAM CAREER INSTITUTE

Consider the following statements and select the correct statements for monocot stem.

A. Absence of phloem parenchyma

B. Conjoint, collateral & closed vascular bundles with endarch xylem

C. Sclerenchymatous bundle sheath present around the vascular bundles

D. Semilunar patches of sclerenchyma above the phloem

→ DICOT STEM में.

(1) A and C (2) A, B and C

(3) B and D (4) A, C and D

Question no. 115

AAYAM CAREER INSTITUTE

Monocot stem resembles dicot stem in having

(1) Conjoint and collateral vascular bundles

(2) Endarch condition of xylem

(3) Water–containing cavities in vascular bundles

(4) All except (3)

Question no. 116

AAYAM CAREER INSTITUTE

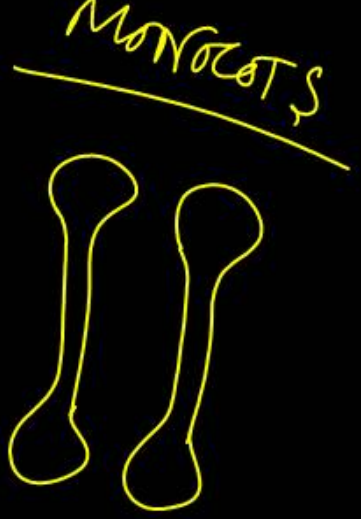
In grasses, guard cells of stomata are

(1) Bean shaped

(2) Kidney shaped

(3) Dumb–bell shaped

(4) Sickle shaped



Question no. 117

AAYAM CAREER INSTITUTE

Read the following statements with respect to dicot stem.

A. Vascular bundles are arranged in a ring.

B. Epidermis is covered by a thin layer of cuticle.

C. The cells of the endodermis have a deposition of water impermeable waxy material.

D. Pericycle contains both parenchyma and sclerenchyma.

E. Well–developed pith is present in centre.

How many of the above given statements are correct?

(1) Two (2) Three

(3) One (4) Four

Question no. 118

AAYAM CAREER INSTITUTE

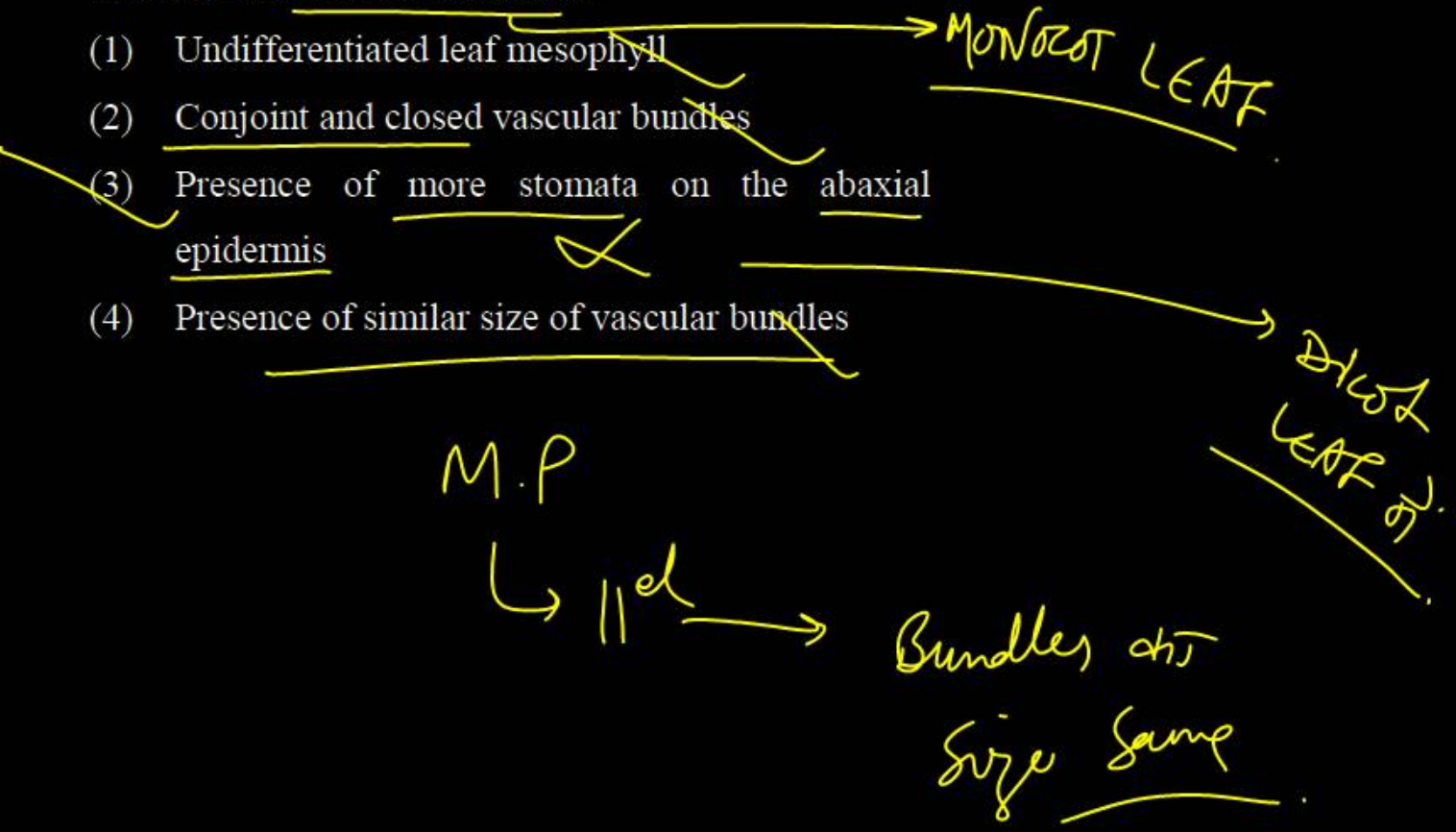
The feature which is not associated with internal structure of an isobilateral leaf is

(1) Undifferentiated leaf mesophyll

(2) Conjoint and closed vascular bundles

(3) Presence of more stomata on the abaxial epidermis

(4) Presence of similar size of vascular bundles



Question no. 119

AAYAM CAREER INSTITUTE

Large, empty colorless cells of the adaxial epidermis along the veins of grass leaves are

(1) Bulliform cells

(2) Lenticels

(3) Guard cells

(4) Bundle sheath cells

Question no. 120

AAYAM CAREER INSTITUTE

Read the following features with respect to guard cells:

A. Enclose stomatal aperture

B. Are dumbbell shaped in dicots

C. Outer wall is thick and inner wall is thin.

D. Regulates opening and closing of stomata.

(1) A and D are correct

(2) A, C and D are correct

(3) A, C and D are correct

(4) A, B, C and D are correct

Question no. 121

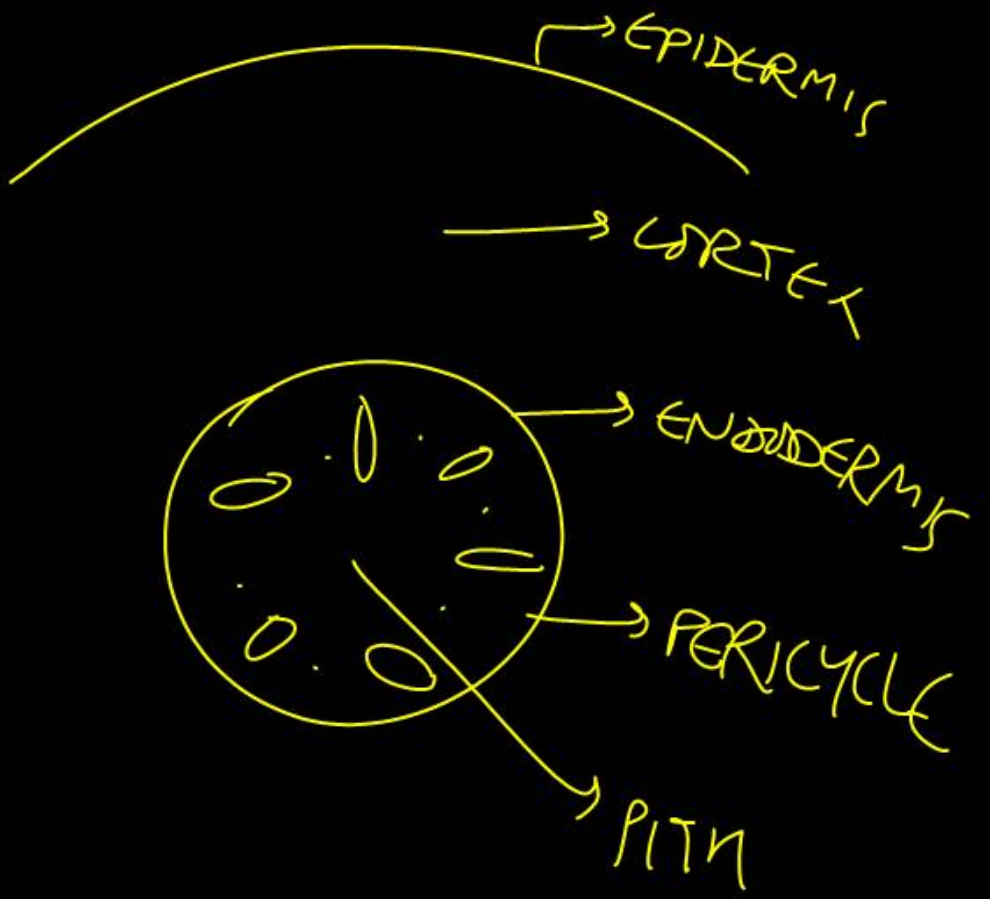
The correct sequence of layers from outerside to inside of a typical monocot root is

(1) Epidermis, endodermis, cortex, vascular bundles, pericycle and pith

(2) Epidermis, endodermis, cortex, pericycle, vascular bundles and pith

(3) Epidermis, cortex, endodermis, pericycle, vascular bundles and pith

(4) Pericycle, epidermis, endodermis, pith, cortex and vascular bundles



Question no. 122

AAYAM CAREER INSTITUTE

Which one of the following is not a part of ground tissue system?

(1) Epidermis
(2) Cortex
(3) Pericycle
(4) pith

CORTEX

PERI.

PITH

Question no. 123

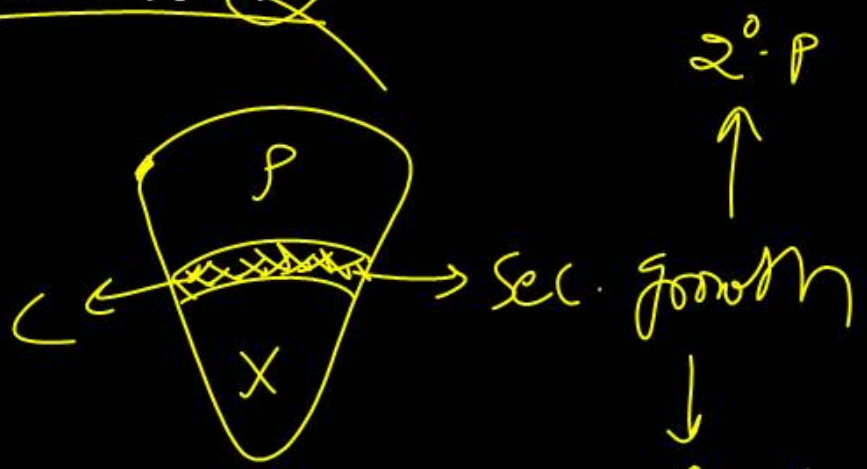
Some vascular bundles are described open because these

(1) are surrounded by pericycle but not endodermis.

(2) are capable of producing secondary xylem and phloem.

(3) possess conjuctive tissue between xylem and phloem.

(4) are not surrounded by pericycle.



Question no. 124

AAYAM CAREER INSTITUTE

Ground tissue includes

(1) all tissues external to endodermis

(2) all tissues except epidermis and vascular bundles → CORTEX PERICYCLE PITH

(3) epidermis and cortex

(4) all tissues internal to endodermis

Question no. 125

AAYAM CAREER INSTITUTE

Which one of the following is not a part of stele?

(1) Pith
(2) Vascular bundle
(3) Endodermis
(4) Pericycle

R + PT

ALL TISSUES INSIDE ENDODERMIS

Question no. 126

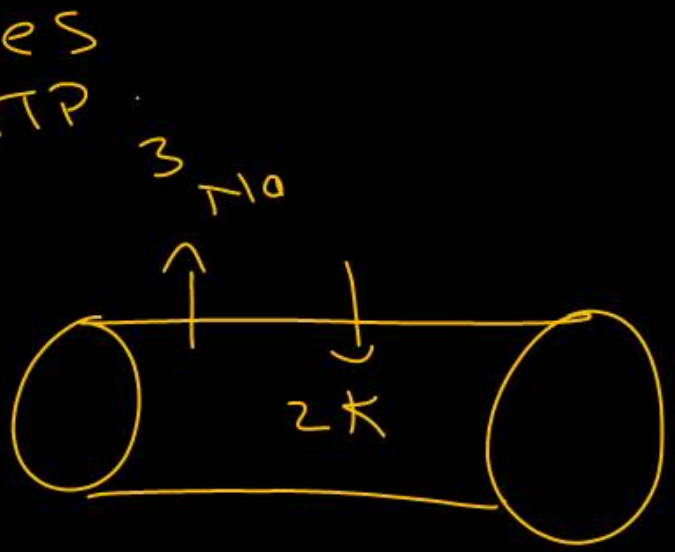
Sodium – Potassium pump across membrane, actively transports.

(1) 2-Na^+ ions outwards and 3 K^+ ions into the cell.

(2) 3-Na^+ ions outwards and 2 K^+ ions into the cell.

(3) 2-K^+ ions outwards and 3 Na^+ ions into the cell.

(4) 3-K^+ ions outwards and 2 Na^+ ions into the cell.



2

Question no. 127

AAYAM CAREER INSTITUTE

During resting stage the axonal membrane is

(1) Impermeable to both cations and anions.

(2) Permeable to both cations and anions.

(3) More permeable to K^+ ions and nearly impermeable to Na^+ ions.

(4) None of these

3

Question no. 128

AAYAM CAREER INSTITUTE

The brain-stem includes the parts of

(1) Fore brain and mid brain

(2) Mid brain, pons and medulla oblongata

(3) Fore brain, mid brain and hind brain

(4) Hind brain only

2

Question no. 129

AAYAM CAREER INSTITUTE

Which of the following statements are correct?

A. Somatic nervous system-Relays impulses from CNS to skeletal muscles.

B. Autonomic nervous sytem - Transmits impulses from CNS to involuntary organ and smooth muscles.

C. Central nervous system - Consists of brain and spinal cord.

D. Visceral nervous system - Consists of nerves carrying impulses to brain and spinal cord only.

(1) Only B and C (2) Only C and D

(3) Only A, B and C (4) All of these

Question no. 130

AAYAM CAREER INSTITUTE

Match the column I (various phase of an action potential) with column II (ionic activity associated) and choose the correct option.

	Column – I		Column – II
A.	Resting stage of a neuron	i.	Opening and then closing of the sodium channels
B.	Depolarization phase in the generation of an action potential	ii.	All voltage gated sodium and potassium channels are closed.
C.	Repolarization phase in the generation of action potential	iii.	The sodium channels remain opened.
D.	Absolute refractory phase.	iv.	Opening of potassium gates and the rushing of potassium

(1) A – ii, B – i, C – iv, D – iii

(2) A – i, B – ii, C – iii, D – iv

(3) A – iii, B – iv, C – i, D – ii

(4) A – iv, B – ii, C – iii, D – i

Question no. 131

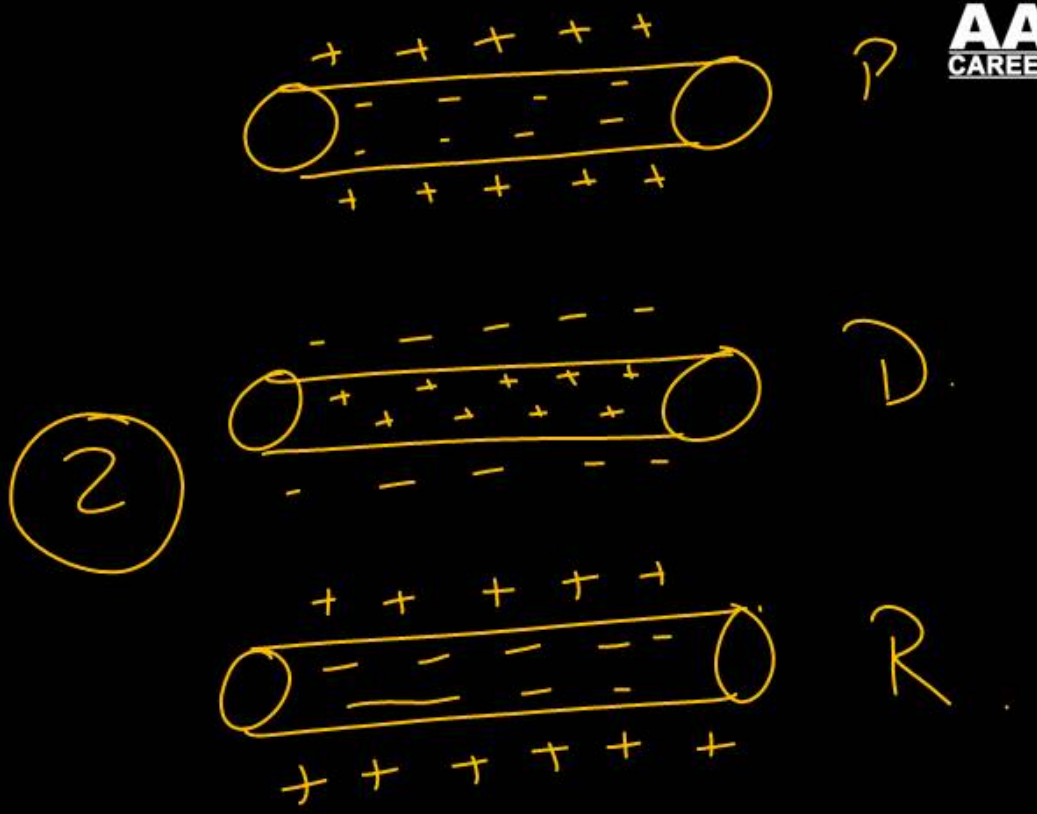
During the transmission of nerve impulse through a nerve fibre, the potential on the inner side of the plasma membrane has which type of electric charge?

(1) First positive, then negative and again back to positive.

(2) First negative, then positive and again back to negative.

(3) First positive, then negative and continue to be negative.

(4) First negative, then positive and continue to be positive.



Question no. 132

AAYAM CAREER INSTITUTE

Match List –I with List –II.

	List –I		List-II
A.	Multipolar neuron	i.	Somatic neural system
B.	Bipolar neuron	ii.	Cerebral cortex
C.	Myelinated nerve fibre	iii.	Retina of Eye
D.	Unmyelinated nerve fibre	Iv	Spinal nerves

(1) A-ii, B-iii, C-iv, D- i

(2) A-iii, B-i, C-iv, D- ii

(3) A-ii, B-iv, C-iii, D- i

(4) A-ii, B-iii, C-i, D- iv

Question no. 133

AAYAM CAREER INSTITUTE

The parts of human brain that helps in regulation of sexual behavior, expression of excitement, pleasure, rage, fear etc. are:

(1) Limbic system and hypothalamus

(2) Corpora quadrigemina and hippocampus

(3) Brain stem and epithalamus

(4) Corpus callosum and thalamus

Question no. 134

AAYAM CAREER INSTITUTE

Which of the following structures or regions is incorrectly paired with its functions?

(1) Medulla oblongata : controls respiration and cardiovascular reflexes.

(2) Limbic system : consists of fibre tracts that interconnect different regions of brain, controls movement.

(3) Corpus callosum : band of fibers connecting left and right cerebral hemispheres.

(4) Hypothalamus : production of releasing hormones and regulation of temperature, hunger and thirst.

Question no. 135

Sequence of meninges from inner to outside is

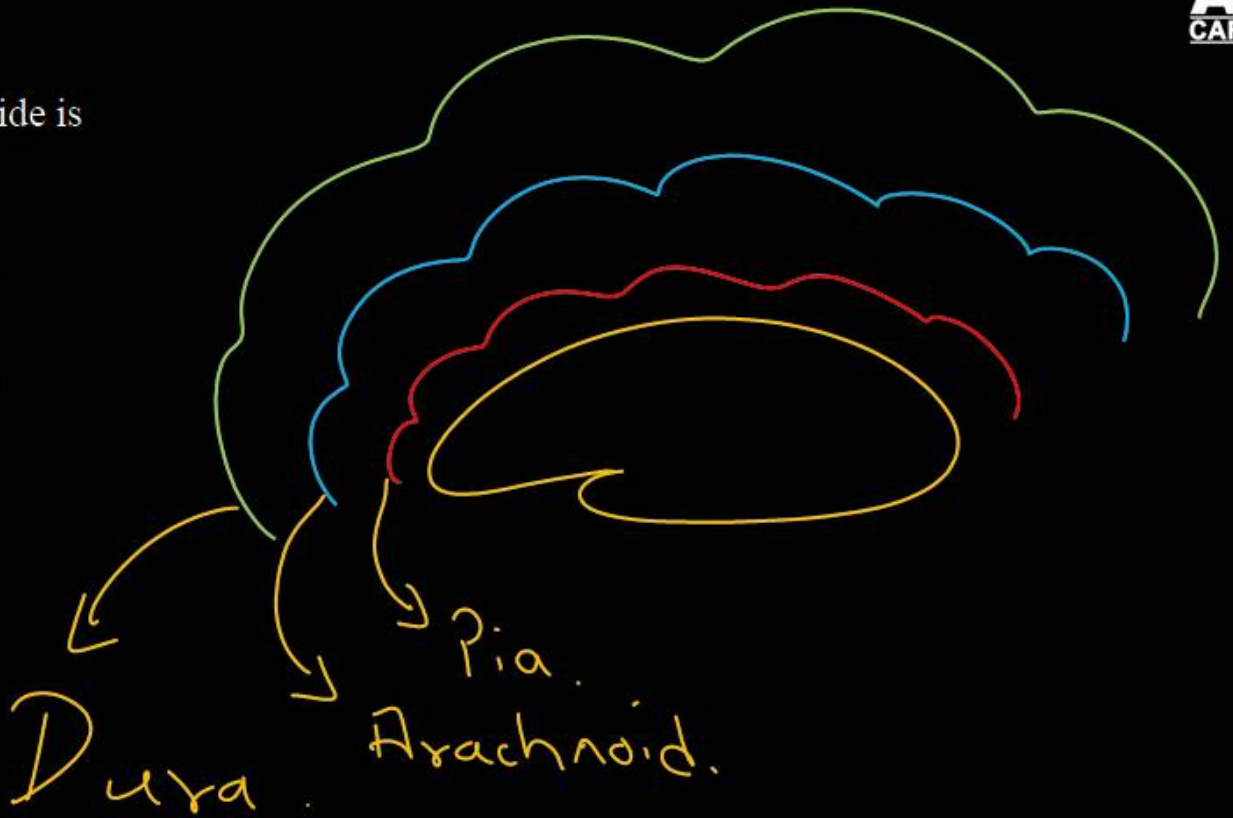
(1) Duramater – Arachnoid – Piamater

(2) Duramater – Piamater– Arachnoid

(3) Arachnoid – Duramater – Piamater

(4) Piamater – Arachnoid – Duramater

(4)



Question no. 136

AAYAM CAREER INSTITUTE

Column I lists the parts of the human brain and column II lists the functions. Match the two columns and identify the correct option.

	Column I		Column II
A.	Cerebrum	I.	Body temperature
B.	Cerebellum	II.	Controls vision and hearing
C.	Hypothalamus	III.	Controls the rate of heart beat
D.	Medulla oblongata	IV.	Maintains body posture

(1) A–II, B–IV, C–I, D–III

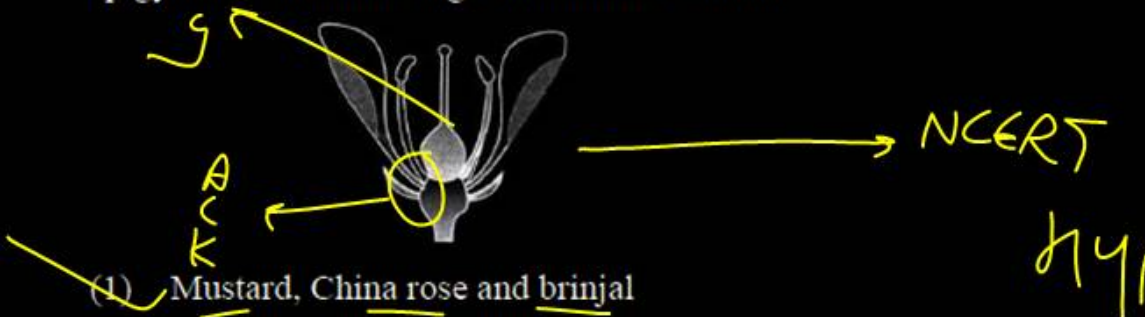
(2) A–IV, B–II, C–III, D–I

(3) A–I, B–IV, C–III, D–II

(4) A–III, B–IV, C–I, D–II

Question no. 137

Based one the position of calyx, corolla and androecium in respect of the ovary on thalamus, the flowers are described as hypogynous, perigynous and epigynous. The following condition is found in



(1) Mustard, China rose and brinjal

(2) Plum, rose and peach

(3) Guava, cucumber and the ray florets of sunflower

(4) Rose, China rose and sunflower

NCERT

Hypogynous

અધોજાયાંગી

B M C

Question no. 138

AAYAM CAREER INSTITUTE

Match the columns I and II, and choose the correct combination from the options given.

	Column I		Column II
a.	Sepals free	1.	Gamopetalous
b.	Petals united	2.	Gamosepalous
c.	Petals free	3.	Polysepalous
d.	Sepals united	4.	Polypetalous

(1) a-3, b-1, c-2, d-4

(2) a-3, b-4, c-1, d-2

(3) a-2, b-1, c-4, d-3

(4) a-3, b-1, c-4, d-2

Question no. 139

AAYAM CAREER INSTITUTE

Choose the correct statement about liverworts.

A. In liverworts, the antheridium and archegonium produce the antherozoid and the egg which fuse during sexural reproduction.

B. Both male and female sex organs may be present on same thalli or different thalli.

C. A sporophyte is formed from the zygote which is differentiated into the foot, seta and capsule.

D. Meiosis occurs in some cells of the capsule giving rise to haploid spores.

E. The spores germinate to form free- living sporophytes.

(1) A and E only
(2) A, B and D only
(3) C and D only
(4) A, B, C and only

Question no. 140

AAYAM CAREER INSTITUTE

Match List - I with List –II.

	List – I Population		**List –II** (Example)
A.	Predation	I.	Cuscuta and hedge plants
B.	Mutualism	II.	Balanus and Chathamalus
C.	Parasitism	III.	Mycorrhiza
D.	Competition	IV.	Pisaster

(1) A - III, B – IV, C - I, D – II

(2) A - IV, B – III, C - I, D - II

(3) A - I, B – III, C - II, D – IV

(4) A - III, B – IV, C - II, D - I

Question no. 141

AAYAM CAREER INSTITUTE

Given below are two statements:

Statement I : meiosis involves pairing of homologous chromosomes and recombination between them.

Statement II : meiosis involves two sequential cycle of nuclear and cell division called meiosis I and meiosis II, but only a single cycle of DNA replication.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both statement I and statement II are correct.

(2) Both statement I and statement II are incorrect.

(3) Statement I is correct but statement II is incorrect.

(4) Statement I is incorrect but statement II is correct.

Question no. 142

AAYAM CAREER INSTITUTE

Which of the following statement is not correct for two genes that show 50% recombination frequency?

A. The genes are tightly linked.

B. The genes show independent assortment.

C. If the genes are present on the same chromosome they undergo more than one crossovers in every meiosis.

D. The genes may be on different chromosomes.

(1) A only

(2) C only

(3) A and D only

(4) A, C and D only

Question no. 143

AAYAM CAREER INSTITUTE

Study the given reason on the basis of which pregnancy can be terminated. Identify the correct reasons.

A. To get rid of unwanted pregnancies.

B. To prevent the fatality or harmfulness to the mother or to foetus or both due to the continuation of pregnancy.

C. Termination of pregnancy is safe in each and every case.

D. If the foetus is male.

E. It plays an important role in decreasing the population.

(1) A, B only (2) B, C only

(3) C, D, E only (4) A, B, C and D only

Question no. 144

AAYAM CAREER INSTITUTE

Given below are two statements :

Statement I : Conditional reabsorption of Na^+ and water takes place in DCT.

Statement II : Loop of Henle concentrates urine.

In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both statement I and statement II are correct.

(2) Both statement I and statement II are incorrect.

(3) Statement I is correct but statement II is incorrect.

(4) Statement I is incorrect but statement II is correct.

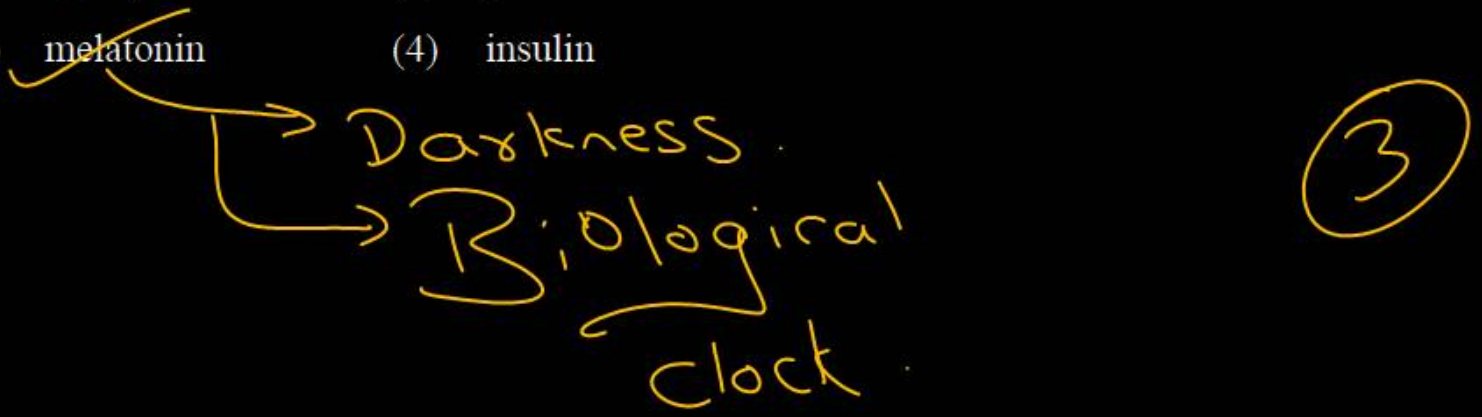
Question no. 145

AAYAM CAREER INSTITUTE

A hormone responsible for normal sleep-wake cycle is

(1) epinephrine (2) gastrin

(3) melatonin (4) insulin



Question no. 146

AAYAM CAREER INSTITUTE

Which one of the following statement regarding coelom of given animals is correct?

(1) Round worms (aschelminthes) are pseudocoelomates.

(2) Molluscs are acoelomates.

(3) Insects are pseudocoelomates.

(4) Flatworms (platyhelminthes) are coelomates.

Question no. 147

AAYAM CAREER INSTITUTE

The floral formula of the Brassicaceae family is represented as:

(1) $\mathrm{Br}\,\male\,\oplus\,K_{(5)}\,C_5\,A_{(\infty)}\,G_{(5)}$

(2) $\oplus\,\male\,K_5\,C_5\,A_{\infty}\,G_{(5\text{-}15)}$

(3) $\%\,\male\,K_{(5)}\,C_5\,A_5\,G_{(2\text{-}5)}$

(4) $\oplus\,\male\,K_{2+2}\,C_4\,A_{2+4}\,\underline{G}_{(2)}$

Question no. 148

AAYAM CAREER INSTITUTE

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) : Cocaine has a potent stimulating action on central nervous system, producing a sense of euphoria and increased energy.

Reason (R): Injecting the microbes intentionally during

immunisation or infectious organisms gaining access into body during natural infection induces active immunity.

In the light of the above statements, choose the **correct**answer from the options given below:

(1) Both A and R are true and R is the correct explanationofA

(2) Both A and R are true but R is **NOT** the correct explanation of A.

(3) A is true but R is false.

(4) A is false but R is true.

Question no. 149

AAYAM CAREER INSTITUTE

Given below are two statements:

Statement I; 'Saheli' is an oral pill which has low contraception value and very high side effects.

Statement II: 'Saheli' contains progestin with no estrogen and a non-steroidal preparation.

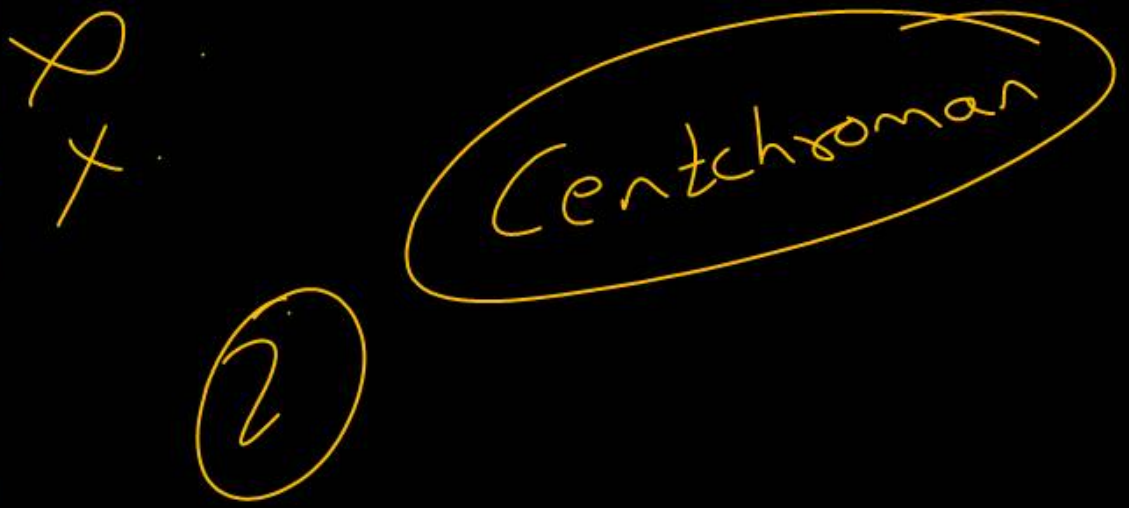
In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both statement I and statement II are correct.

(2) Both statement I and statement II are incorrect.

(3) Statement I is correct but statement II is incorrect.

(4) Statement I is incorrect but statement II is correct.



Question no. 150

AAYAM CAREER INSTITUTE

A sarcomere is best described as a

(1) movable structural unit within a myofibril bounded by H zones.

(2) fixed structural unit within a myofibril bounded by Z lines.

(3) fixed structural unit within a myofibril bounded byAbands.

(4) movable structural unit within a myofibril bounded by Z lines.

4

Question no. 151

AAYAM CAREER INSTITUTE

While isolating DNA from bacteria, which of the following enzymes is not used?

(1) Lysozyme

(2) Ribonuclease

(3) Deoxyribonuclease

(4) Protease

3

Question no. 152

AAYAM CAREER INSTITUTE

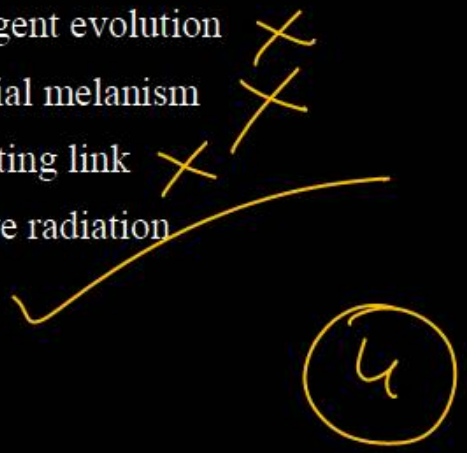
Darwin's finches are a good example of:

(1) convergent evolution

(2) industrial melanism

(3) connecting link

(4) adaptive radiation



Question no. 153

AAYAM CAREER INSTITUTE

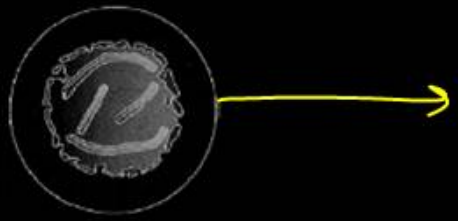
Plastids storing oil and fat are called

(1) Elaioplasts
(2) Amyloplasts
(3) Aleuroplasts
(4) Pyrenoids

Question no. 154

AAYAM CAREER INSTITUTE

A stage of mitosis is shown in the given diagram. Identify stage with its characteristics?



LATE PROPHASE

(1) Late prophase - Do not show golgi complexes, endoplasmic reticulum, nucleolus and the nuclear envelope

(2) Metaphase - Spindle fibres attached to kinetochores,centromeres split and chromatids separate

(3) Metaphase - Chromosomes moved to spindle equator chromosomes made up of two sister chromatids

(4) Anaphase - Centromeres split and chromatids separate and start moving away

Question no. 155

AAYAM CAREER INSTITUTE

Chemotaxonomy is connected with

(1) classification of chemicals found in plants.

(2) uses the chemical constituent of plant for classification.

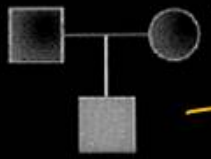
(3) application of chemicals on herbarium sheets.

(4) use of statistical methods in chemical yielding plants.

Question no. 156

AAYAM CAREER INSTITUTE

Match List-I with List-II.

	List – I		List –II
A.		I.	Consanguineous mating
B.		II.	Sex unspecified
C.		III.	Mating
D.		IV.	Parents with male Childaffected with disease

Choose the correct answer from the options given below:

(1) A-III;B-I;C-IV;D-II

(2) A-II;B-I;C-IV;D-III

(3) A-III; B-II; C-I; D-IV

(4) A-III;B-I;C-II;D-IV

Question no. 157

AAYAM CAREER INSTITUTE

"G_0" state of cells in eukaryotic cell cycle denotes

(1) check point before entering the next phase.

(2) pausing in the middle of a cycle to cope with a temporary delay.

(3) death of a cell

(4) exit of cells from cell cycle.

Question no. 158

AAYAM CAREER INSTITUTE

The inflorescence in Poaceae is made up of units called

(A) Capitulum
(B) Spikelet
(C) Cyathium
(D) All

Question no. 159

AAYAM CAREER INSTITUTE

When a .person is suffering from poor renal reabsorption, which one of the following will not help in maintenance of blood volume?

(1) increased ADH secretion.

(2) decreased glomerular filtration.

(3) increased arterial pressure in kidneys.

(4) decreased arterial pressure in kidneys.

3

RAAS.

GFR ↓ → J.G.

↓

Renin.

↓

R.A.A.S

Question no. 160

AAYAM CAREER INSTITUTE

C-peptide of human insulin is

(1) a part of mature insulin molecule

(2) responsible for the formation of disulphide bridges

(3) removed during maturation of pro-insulin to insulin

(4) responsible for its biological activity

3

Question no. 161

AAYAM CAREER INSTITUTE

Elbow joint is an example of

(1) hinge joint (2) gliding joint

(3) ball and socket joint (4) pivot joint

Question no. 162

AAYAM CAREER INSTITUTE

A file like rasping organ for feeding, called radula present in the phylum_____.

(1) arhropoda (2) mollusca

(3) echinodermata (4) chordata

2

Question no. 163

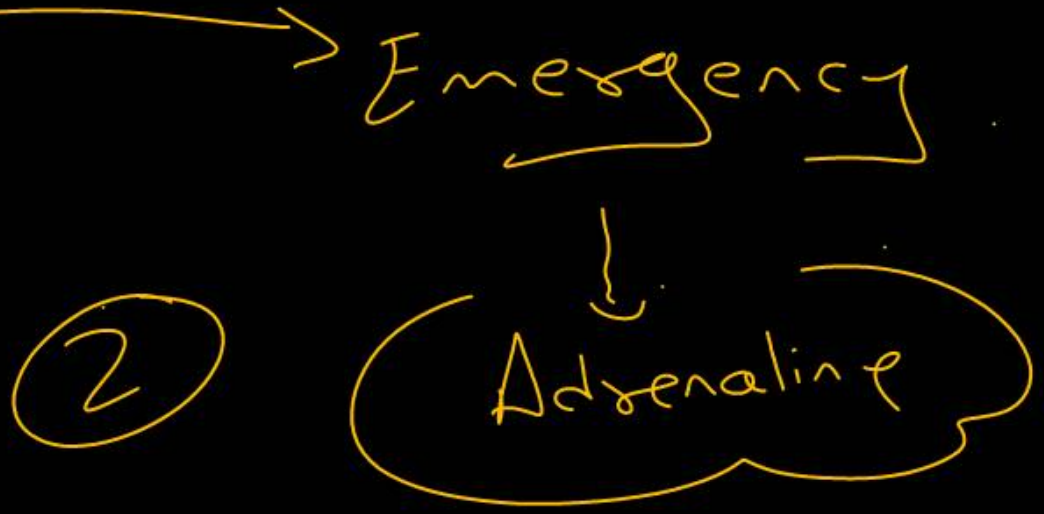
Sympathetic nervous system

(1) controls hearbeat

(2) increases hearbeat

(3) decreases hearbeat

(4) not related to hearbeat



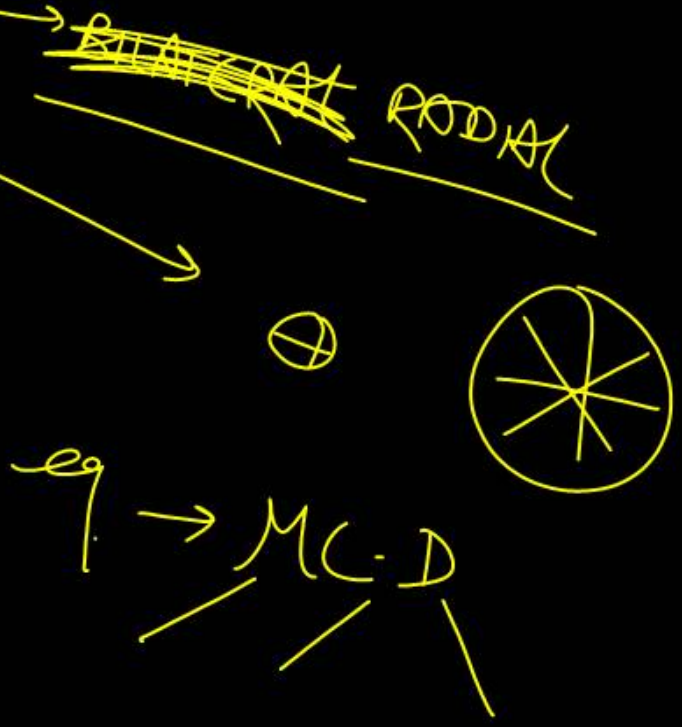
Question no. 164

AAYAM CAREER INSTITUTE

Select the plants having actinomorphic symmetry in flower.

A. Mustard
B. Datura
C. Bean
D. Chilli

(1) Only A and B
(2) A, B and C only
(3) A, B and D
(4) A, B, C and D



Question no. 165

AAYAM CAREER INSTITUTE

Ovary wall and ovule after fertilization develop into respectively

(1) Pericarp and seed

(2) Seed and perisperm

(3) Pericarp and endocarp

(4) Fruit and fruit wall

OVARY → FRUIT

OVULE → SEED

Question no. 166

AAYAM CAREER INSTITUTE

Identify the correct features of mango and coconut fruits.

(i) In both fruit is a drupe

(ii) Endocarp in edible in both

(iii) Mesocarp in coconut is fibrous, and in mango it is fleshy & EDIBLE

(iv) In both, fruit develops from monocarpellary ovary.

Select the correct option from below:

(1) (i) and (ii) only

(2) (i), (iii) and (iv) only

(3) (i), (ii) and (iii) only

(4) (i) and (iv) only

Question no. 167

AAYAM CAREER INSTITUTE

Match column I with column II and choose the correct combination from the options given below.

	Column I (Aestivation)		**Column II** (Example)
(a)	Valvate	(i)	Bean
(b)	Twisted	(ii)	Gulmohur
(c)	Imbricate	(iii)	calotropis
(d)	Vexillary	(iv)	China rose

(1) a–(iv), b–(i), c–(ii), d–(iii)

(2) a–(iv), b–(ii), c–(i), d–(iii)

(3) a–(ii), b–(iv), c–(i), d–(iii)

(4) a–(iii), b–(iv), c–(ii), d–(i)

Question no. 168

AAYAM CAREER INSTITUTE

Match column I with column II and choose the correct combination from the options given below.

	Column I		Column II
(a)	Marginal	(i)	Dianthus
(b)	Axile	(ii)	Marigold
(c)	Free central	(iii)	Pea plant
(d)	Basal	(iv)	China rose

(1) a–(ii), b–(iv), c–(i), d–(iii)

(2) a–(iv), b–(ii), c–(i), d–(iii)

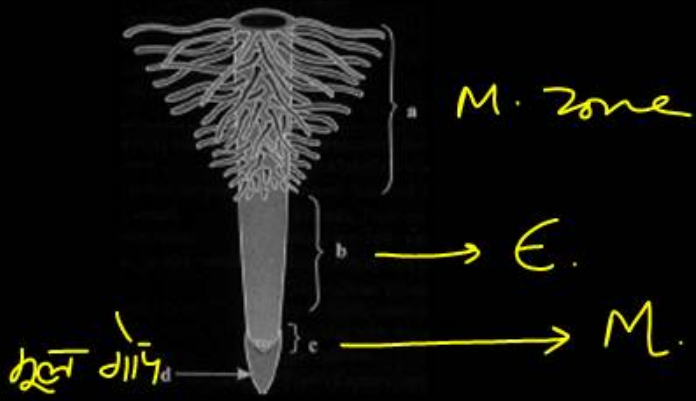
(3) a–(iii), b–(iv), c–(i), d–(ii)

(4) a–(iv), b–(iii), c–(ii), d–(i)

Question no. 169

AAYAM CAREER INSTITUTE

Given below are regions of roots. Identify the incorrect statement w.r.t. labels a, b, c, and d.



(1) d—thumb-like structure which performs the functionof penetration of soil

(2) b—Cell of this region undergoes rapid elongation and enlargement

(3) c—Cells of this region divide repeatedly

(4) a—Region of root proximal to region of meristeniaticactivity

Question no. 170

AAYAM CAREER INSTITUTE

Select the correct match.

	Plant	Phyllotaxy
(1)	China rose	Opposite
(2)	Alstonia	Alternate
(3)	Guava	Opposite
(4)	Sunflower	Whorled

[ALTERNATE]

G.O.T

Question no. 171

AAYAM CAREER INSTITUTE

In a racemose inflorescence, the main axis

(1) Bears a solitary flower

(2) Has unlimited growth

(3) Terminates in a flower

(4) Has limited growth and flowers are born in acropetalmanner

Question no. 172

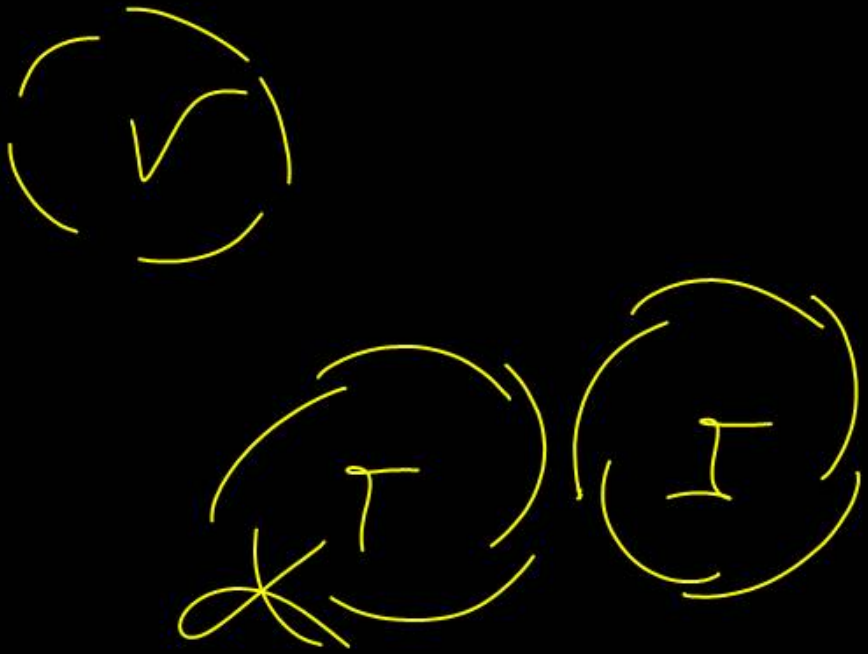
AAYAM CAREER INSTITUTE

Identify the type of aestivation on the basis of given statements A and B.

A. Sepals or petals in a whorl just touch one another atthe margins without overlapping.

B. Margins of sepals or petals overlap one another butnot in a particular direction.

	A	B
(1)	Valvate	Imbricate
(2)	Valvate	Twisted
(3)	Twisted	Imbricate
(4)	Imbricate	Valvate



Question no. 173

AAYAM CAREER INSTITUTE

Monadelphous and polyadelphous condition is present, respectively, in

(1) Pea and chain rose

(2) China rose and Citrus

(3) China rose and Pea

(4) Citrus and Pea

- M / एकसंघी → C.R

D → ∫

- P / बहु .. → C

Question no. 174

AAYAM CAREER INSTITUTE

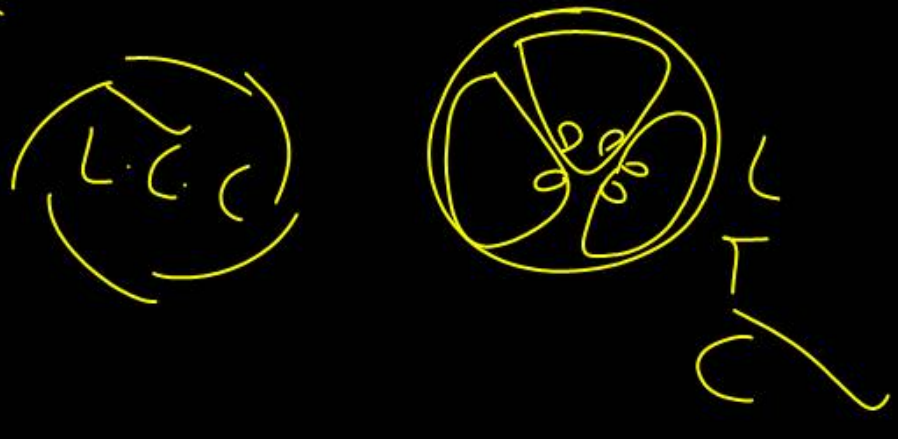
The flower of China rose are characterized by all except

(1) Twisted aestivation of petals

(2) Stamens are united in two bundles

(3) Presence of placenta in axile position

(4) Flower is hypogynous



Question no. 175

AAYAM CAREER INSTITUTE

Select the wrongly matched pair.

(1) Epiphyllous condition - Lily

(2) Monadelphous stamen - Pea

(3) Ovary inferior - Ray florets of sunflower

(4) Apocarpous condition - Papaver

SYN

BOTH (2 & 4)

Question no. 176

AAYAM CAREER INSTITUTE

Basal placenaion is found in

(1) Argemone and mustard

(2) Dianthus and primrose

(3) China rose and tomato

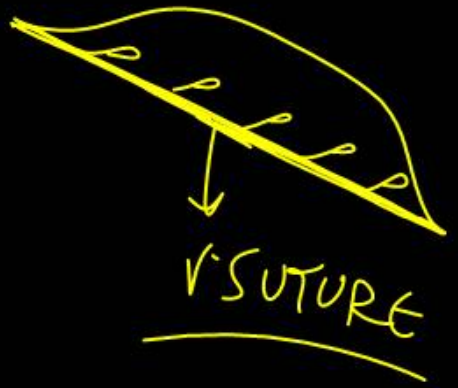
(4) Sunflower and marigold

Question no. 177

AAYAM CAREER INSTITUTE

In which of the following placentation, the ovaries are born on the ridge along the ventral suture of the ovary forming two rows?

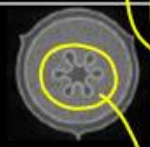
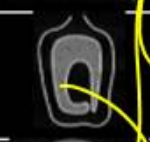
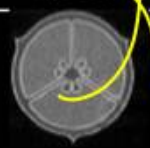
(1) Marginal
(2) Free central
(3) Parietal
(4) Basal



Question no. 178

AAYAM CAREER INSTITUTE

Mach column I and column II and select the correct option.

	Column I		Column II
(a)		i.	Marginal
(b)		ii.	Parietal
(c)		iii.	Axile
(d)		iv.	Free central
(e)		v.	Basal

परिधीय

(1) a-ii, b-iv, c-i, d-v, e-iii

(2) a-iii, b-iv, c-i, d-ii, e-v

(3) a-ii, b-i, c-iv, d-iii, e-v

(4) a-iv, b-iii, c-v, d-ii, e-i

Question no. 179

AAYAM CAREER INSTITUTE

The family Malvaceae is characterised by

(A) Monadelphous stamens

(B) Diadelphous stamens

(C) Both

(D) Epipetalous stamens

Question no. 180

AAYAM CAREER INSTITUTE

In Poaceae (Gramineae), the fruit is

(A) Legume

(B) Caryopsis

(C) Capsule

(D) All