Question no. 1

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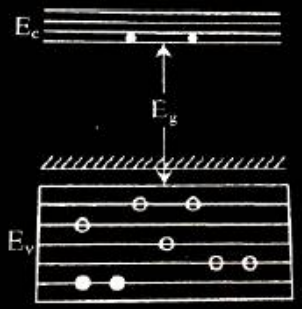
In the energy band diagram of a material shown below, the open circles and filled circles denote holes and electrons respectively. The material is



(1) an insulator

(2) a metal

(3) an n-type semiconductor

(4) a p-type semiconductor

$n_h >> n_e$

p type

4.

Question no. 2

The refracting angle of a prism is A and refractive index of the material of the prism is cot (A/2). Then the angle of minimum deviation will be

(1) $180^\circ - 2A$

(2) $90 - A$

(3) $180^\circ + 2A$

(4) $180^\circ - 3A$

$$\frac{n_p}{n_s} = \frac{\sin\left(\frac{A+\delta_m}{2}\right)}{\sin(A/2)}$$

$$\frac{\cot(A/2)}{1} = \frac{\sin\left(\frac{A+\delta_m}{2}\right)}{\sin A/2}$$

$$\frac{\cos(A/2)}{\sin(A/2)} = \frac{\sin\left(\frac{A+\delta_m}{2}\right)}{\sin A/2}$$

$$\cos A/2 = \sin\left(\frac{A+\delta_m}{2}\right)$$

$$\sin(90 - A/2) = \sin\left(\frac{A+\delta_m}{2}\right)$$

$$90 - \frac{A}{2} = \frac{A+\delta_m}{2}$$

$$180 - A = A + \delta_m$$

$$\delta_m = 180^\circ - 2A$$

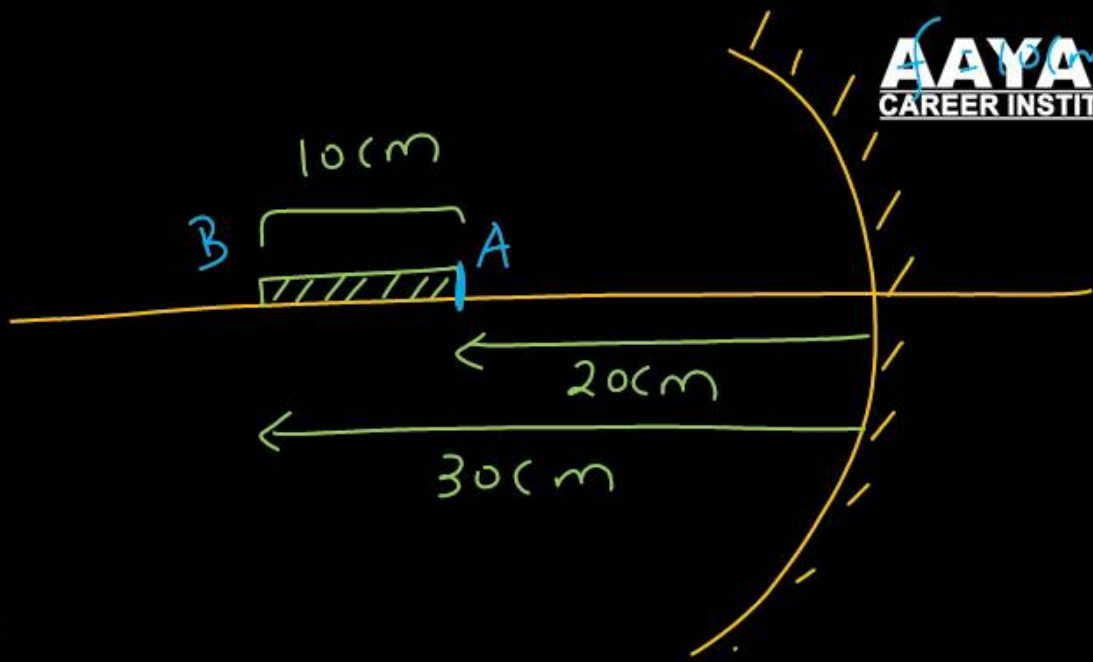
1.

Question no. 3

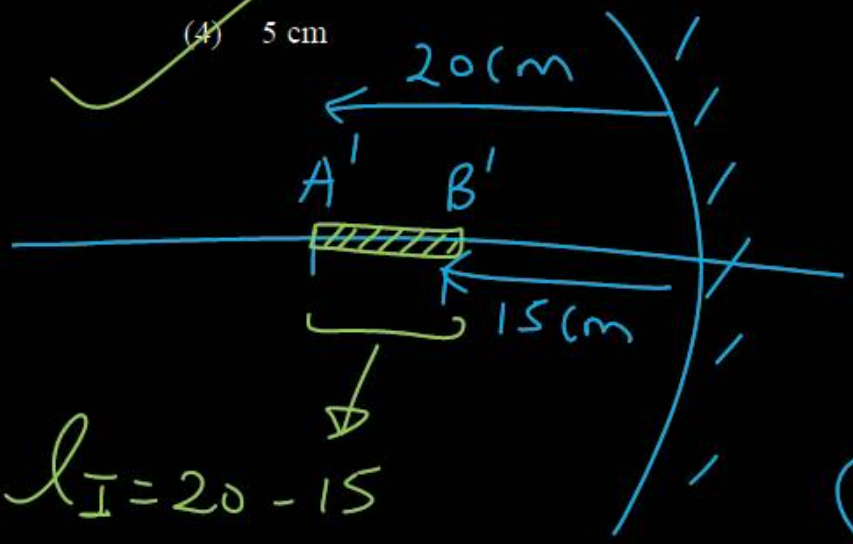
A rod of length 10 cm lies along the principal axis of a concave mirror of focal length 10 cm in such a way that its end closer to the pole is 20 cm away from the mirror. The length of the image is

(1) 10 cm (2) 15 cm

(3) 2.5 cm (4) 5 cm



4.



$l_I = 20 - 15$

$= 5\,cm$

For B $\quad \frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$V = -15\,cm$

$-\frac{1}{10} = \frac{1}{V} - \frac{1}{30}$

$\frac{1}{V} = \frac{1}{30} - \frac{1}{10} = -\frac{1}{15}$

Question no. 4

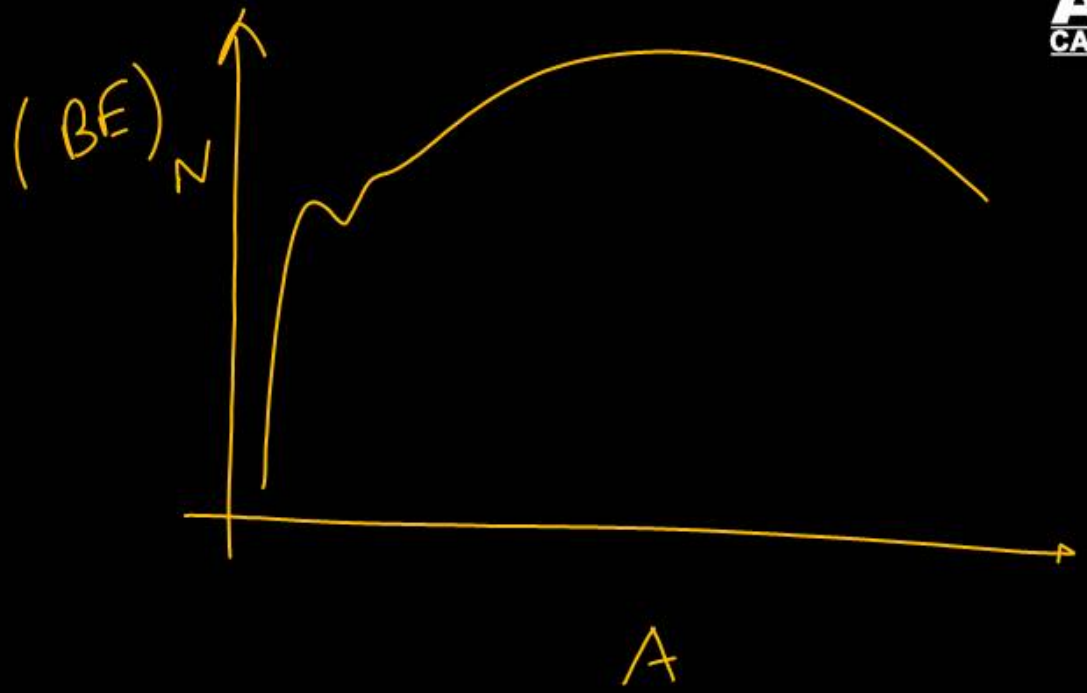
When the number of nucleons in nuclei increases, the binding energy per nucleon

(1) Increase continuously with increasing mass no.

(2) Decreases continuously with increasing mass no.

(3) Remains constant with increasing mass no.

(4) First increases and then decreases with increase of mass no.



4.

Question no. 5

$\nu = 23.9 \times 10^9$ Hz

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A plane electromagnetic wave having a frequency v=23.9 GHz propagates along the positive z-direction in free space. The peak value of the Electric Field is 60 V/m. Which among the following is the acceptable magnetic field component in the electromagnetic wave?

(1) $\vec{B} = 2\times10^{-7}\sin(0.5\times10^{3}z + 1.5\times10^{11}t)\hat{i}$

(2) $\vec{B} = 2\times10^{-7}\sin(0.5\times10^{3}z - 1.5\times10^{11}t)\hat{i}$

(3) $\vec{B} = 60\sin(0.5\times10^{3}x + 1.5\times10^{11}t)\hat{k}$

(4) $\vec{B} = 2\times10^{-7}\sin(0.5\times10^{3}x + 1.5\times10^{11}t)\hat{j}$

2.

$\omega t \pm kz$

$E_0 = B_0 \times c$

$B_0 = \frac{E_0}{c} = \frac{60}{3\times10^8} = 2\times10^{-7}$

Question no. 6

Nucleus A is having mass number 220 and its binding energy per nucleon is 5.6 MeV. It splits into two fragments 'B' and 'C' of mass numbers 105 and 115. The binding energy of nucleons in 'B' and 'C' is 6.4 MeV per nucleon. The energy Q released per fission will be :

(1) 0.8 MeV (2) 275 MeV

(3) 220 MeV (4) 176 MeV

(4)

$Q = (B.E)_P - (B.E.)_R$

$Q = (105 \times 6.4 + 115 \times 6.4) - (220 \times 5.6)$

$Q = 220 \times 6.4 - 220 \times 5.6$

$Q = 220 \times 0.8 = 22 \times 8$

$= 176$ MeV

Question no. 7

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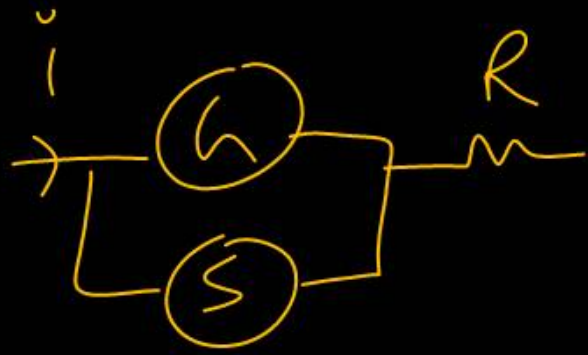
A galvanometer of resistance, G is shunted by a resistance S ohm. To keep the main current in the circuit unchanged the resistance to be put in series with the galvanometer is

(1) $\frac{S^2}{(S+G)}$ (2) $\frac{SG}{(S+G)}$

(3) $\frac{G^2}{(S+G)}$ (4) $\frac{G}{(S+G)}$

3.



$$G = \frac{GS}{G+S} + R$$

$$R = G - \frac{GS}{G+S}$$

$$R = \frac{G^2+GS-GS}{G+S}$$

$$R = \frac{G^2}{G+S}$$

Question no. 8

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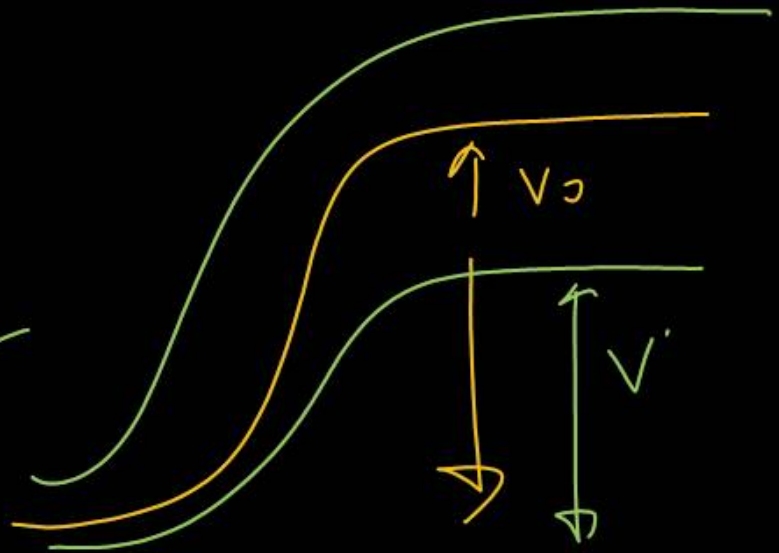
In an experiment when a PN junction diode is forward biased

(1) Only holes are attracted towards each other and move towards the depletion region

(2) electrons and holes move away from the junction depletion region

(3) width of the potential barrier decreases

(4) no change in the current takes place



3.

Question no. 9

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According to the Bohr theory of H–atom, the speed of the electron, its energy and the radius of its orbit varies with the principal quantum number n, respectively, as

(1) $\frac{1}{n}, n^2, \frac{1}{n^2}$

(2) $n, \frac{1}{n^2}, n^2$

(3) $n, \frac{1}{n^2}, \frac{1}{n^2}$

(4) $\frac{1}{n}, \frac{1}{n^2}, n^2$

$v \propto 1/n$

$E \propto \frac{1}{n^2}$

$r \propto n^2$

4.

Question no. 10

The power of a lens (biconvex) is 1.25 m^{-1} in particular medium. Refractive index of the lens is 1.5 and radii of curvature are 20 cm and 40 cm respectively. The refractive index of surrounding medium.

(1) 1.0 (2) $\frac{9}{7}$

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

(2)

$$\frac{1}{f} = \left(\frac{n_R}{n_S} - 1\right)\left(\frac{1}{R_1} - \frac{1}{R_2}\right)$$

$$\frac{1.25}{100} = \left(\frac{1.5}{n_S} - 1\right)\left(\frac{1}{20} - \frac{1}{-40}\right)$$

$$\frac{125}{100 \times 100} = \frac{1}{20} = \frac{1}{4} \quad 2 \quad \frac{1}{80} = \left(\frac{1.5}{n_S} - 1\right) \times \frac{3}{40}$$

$$\frac{1}{6} = \frac{3}{2n_S} - 1 \qquad \frac{7}{6} = \frac{3}{2n_S}$$

$$n_S = 9/7$$

Question no. 11

In a photoelectric effect measurement, the stopping potential for a given metal is found to be V_0 volt when radiation of wavelength λ_0 is used. If radiation of wavelength $2\lambda_0$ is used with the same metal then the stopping potential (in volt) will be

(1) $\frac{V_0}{2}$

(2) $2V_0$

(3) $V_0 + \frac{hc}{2e\lambda_0}$

(4) $V_0 - \frac{hc}{2e\lambda_0}$

$\frac{hc}{\lambda_0} - \phi = eV_0$ — (1)

$\frac{hc}{2\lambda_0} - \phi = eV'$ — (2)

(2) − (1)

$eV' - eV_0 = -\frac{hc}{2\lambda_0}$

$eV' = eV_0 - \frac{hc}{2\lambda_0}$

$V' = V_0 - \frac{hc}{2\lambda_0 e}$

(4)

Question no. 12

Two identical objects are placed in front of convex mirror and concave mirror having same radii of curvature of 12 cm, at same distance of 18 cm from the respective mirrors. The ratio of sizes of the images formed by convex mirror and by concave mirror is:

(1) 1/2 (2) 2

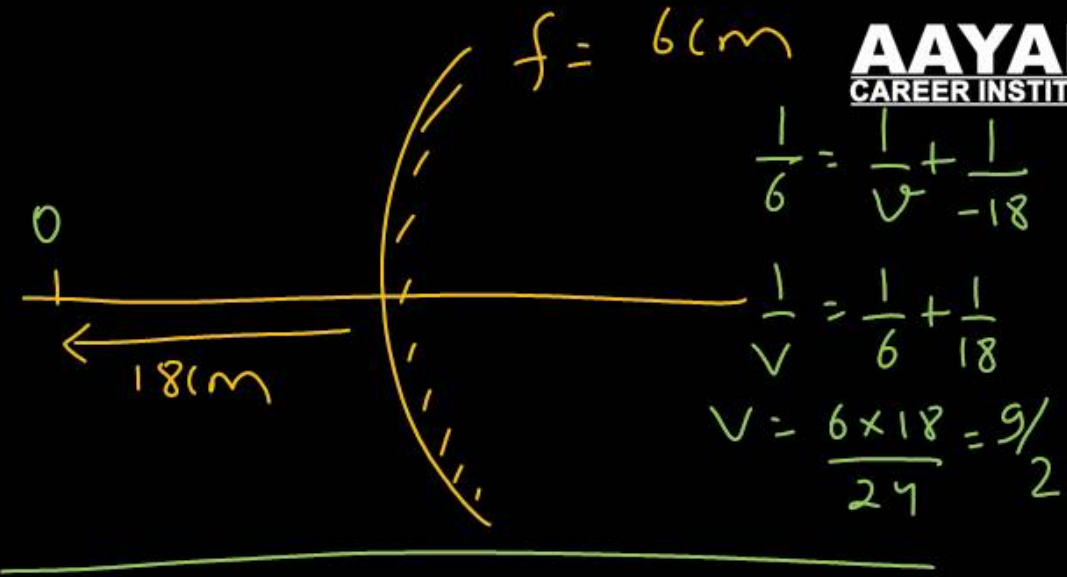
(3) 3 (4) 1/3

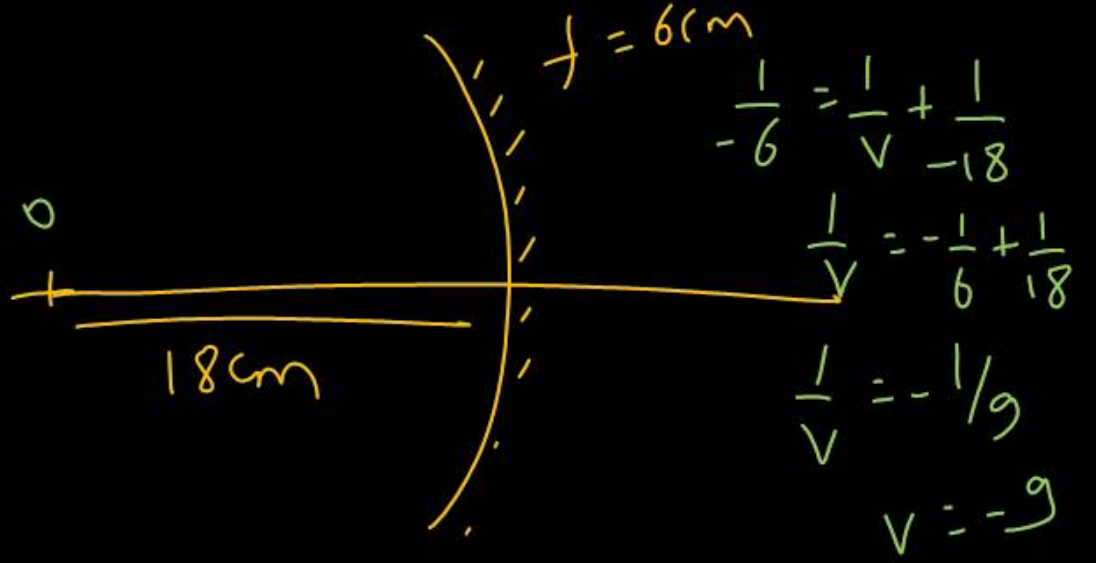
1.

$h_I = m \times h_0$

$h_I \propto m$

$\frac{h_{I_1}}{h_{I_2}} = \left|\frac{m_1}{m_2}\right| = \frac{9/2}{18} = \frac{9}{18} = \frac{1}{2}$





Question no. 13

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The potential at a point x (measured in μ m) due to some charges situated on the x–axis is given by $V(x) = \frac{20}{(x^2 - 4)}$ volt. The electric field E at x = 4 μ m is given by

(1) (10/9) volt/ μ m and in the + ve x direction

(2) (5/3) volt/ μ m and in the – ve x direction

(3) (5/3) volt/ μ m and in the + ve x direction

(4) (10/9) volt/ μ m and in the – ve x direction

1.

$$E = -\frac{dV}{dx}$$

$$E = -\frac{d}{dx} 20(x^2 - 4)^{-1}$$

$$E = -20\left(-1(x^2-4)^{-2}\right)(2x)$$

$$E = \frac{40x}{(x^2-4)^2}$$

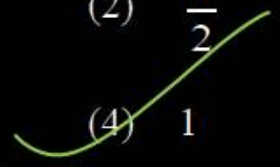
E @ 4 μm $\Rightarrow$ $E = \frac{40 \times 4}{12 \times 12} = \frac{10}{9}$

Question no. 14

Five cells each of emf E and internal resistance r send the same amount of current through an external resistance R whether the cells are connected in parallel or in series. Then the ratio $\left(\frac{R}{r}\right)$ is

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

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



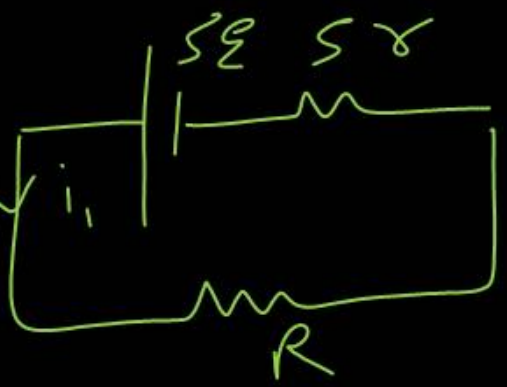
$i_1 = i_2$

$R + 5r = 5R + r$

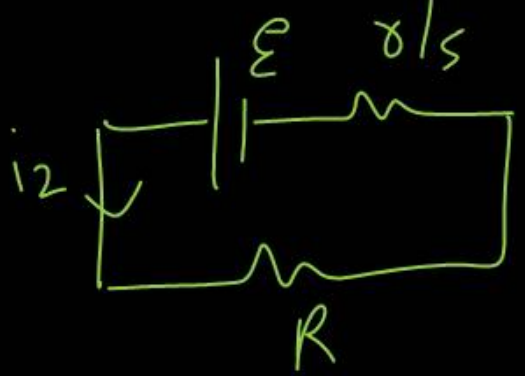
$4r = 4R$

$r = R$

Series:



$$i_1 = \frac{5\varepsilon}{R + 5r}$$



$$i_2 = \frac{\varepsilon}{R + \frac{r}{5}} = \frac{5\varepsilon}{5R + r}$$

Question no. 15

In a reactor, 2 kg of $_{92}U^{235}$ fuel is fully used up in 30 days. The energy released per fission is 200 MeV. The power output of the reactor is

(1) 35 MW (2) 63 MW

(3) 125 MW (4) 54 MW

$$P = \frac{E}{t} = \frac{200 \times 10^6 \times 1.6 \times 10^{-19} \times \frac{2000}{235} \times 6 \times 10^{23}}{30 \times 24 \times 60 \times 60}$$

$P \approx 63\,MW$

moles : $\frac{2000}{235}$

No. of fission $= \frac{2000}{235} \times N_A = N$

(2)

Question no. 16

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A slit of width is illuminated by red light of wavelength 6500 Å. If the first minimum falls at $\theta = 30°$ the value of a is

(1) 6.5×10^{-4} mm (2) 1.3 micron

(3) 3250 Å (4) 2.6×10^{-4} cm

$a\sin\theta = n\lambda$

$a \times \frac{1}{2} = 1 \times 6500 A^{\circ}$

$a = 13000 \times 10^{-10}$

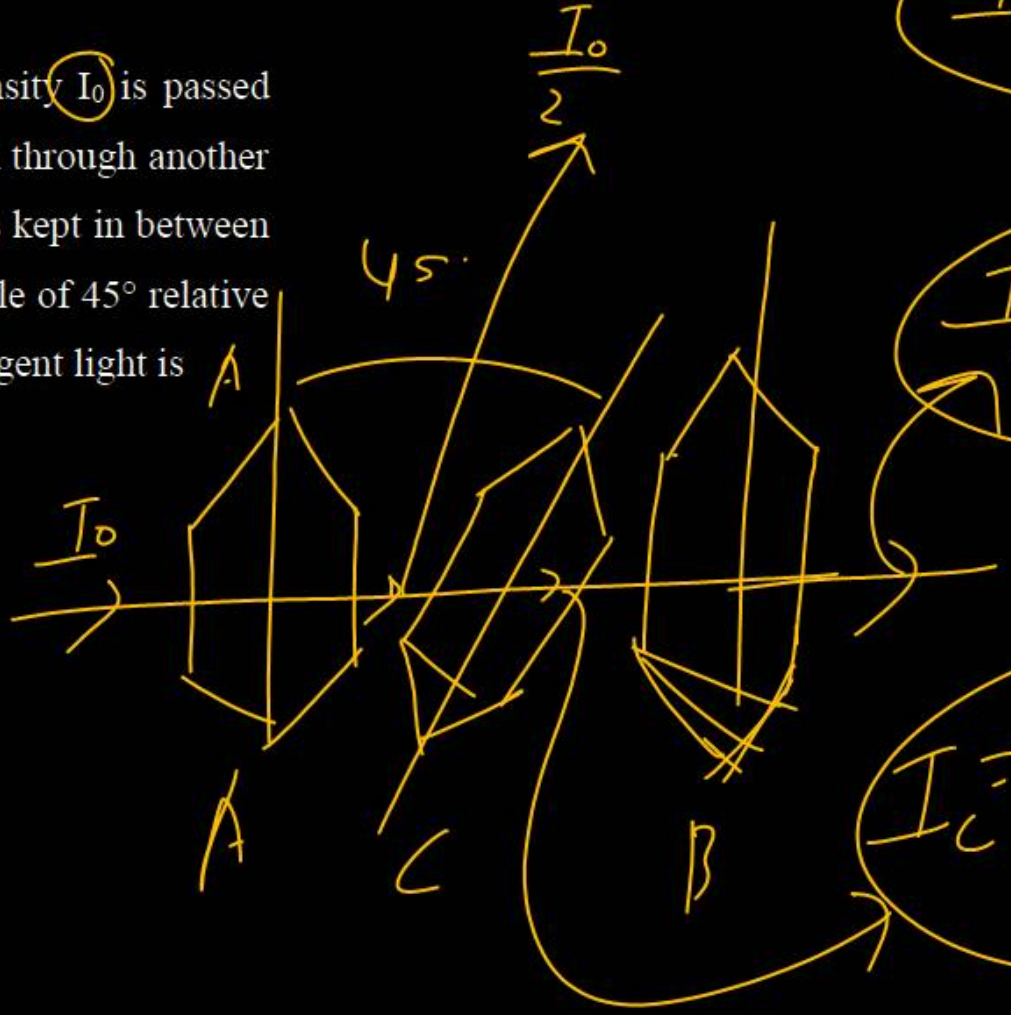
1.3×10^{-6}

Question no. 17

A beam of unpolarised light of intensity I_0 is passed through a similar polaroid A and then through another polaroid B. Then a third polaroid C is kept in between A and B so that its axis makes an angle of 45° relative to that of A. The intensity of the emergent light is

(1) I_0 (2) $I_0/2$

(3) $I_0/4$ (4) $I_0/8$



$I = I_0 \cos^2\theta$

$I_B = \frac{I_0}{4} \times \frac{1}{2} = \frac{I_0}{8}$

$I_C = \frac{I_0}{2} \times \frac{1}{2} = \frac{I_0}{4}$

Question no. 18

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Two coherent sources of light interfere. The intensity ratio of two sources is 1 : 4. For this interference pattern if the value of $\frac{I_{max}+I_{min}}{I_{max}-I_{min}}$ is equal to $\frac{2\alpha+1}{\beta+3}$

then $\frac{\alpha}{\beta}$ will be

(1) 1.5 (2) 2

(3) 0.5 (4) 1

$\frac{I_1}{I_2} = \frac{1}{4} : \frac{I_0 \rightarrow I_1}{4I_0 \rightarrow I_2}$

$I_{max} = (\sqrt{I_0}+2\sqrt{I_0})^2 \Rightarrow 9I_0$

$I_{min} = (\sqrt{I_0}-2\sqrt{I_0})^2 \Rightarrow I_0$

$\frac{9I_0+I_0}{9I_0-I_0} = \frac{10I_0}{8I_0} = \frac{5}{4}$

$\frac{5}{4} = \frac{2\alpha+1}{\beta+3}$

$2\alpha+1 = 5$

$\alpha = 2$

$\beta+3 = 4$

$\beta = 1$

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

Question no. 19

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A coil is wound on a frame of rectangular cross-section. If all the linear dimensions of the frame are increased by a factor 2 and the number of turns per unit length of the coil remains the same self-inductance of the coil increases by a factor of

(1) 4 (2) 8

(3) 12 (4) 16

$$L = \frac{\mu_0 N^2 A \times l}{l}$$

$$L = \mu_0 n^2 A l$$

$$L = \mu_0 n^2 \times (ab \times l)$$

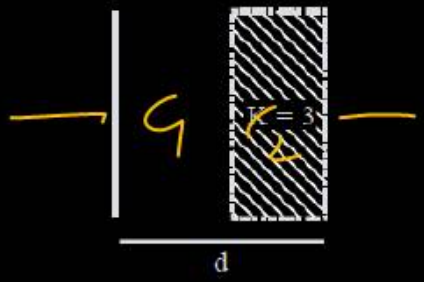
$$l \propto abl$$

$$\frac{2 \times 2 \times 2}{}$$

$$f = 8$$

Question no. 20

A parallel plate capacitor with plate area A and plate separation d=2 m has a capacitance of 4 μF. The new capacitance of the system if half of the space between them is filled with a dielectric material of dielectric constant K=3 (as shown in figure) will be:

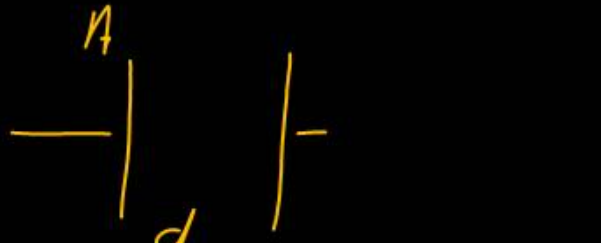


(1) 2 μF

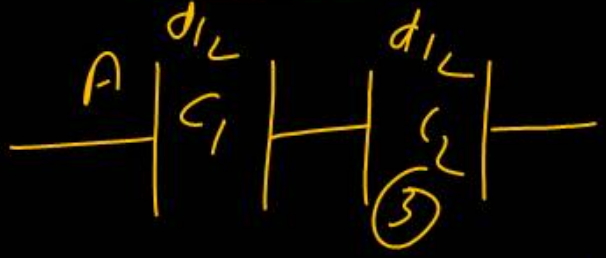
(2) 32 μF

(3) 6 μF

(4) 8 μF



$C = \frac{A\varepsilon_0 \times 1}{d} \rightarrow 4\,\mu F$



$C_1 = \frac{A\varepsilon \times 1 \times 2}{d}$

$C_1 = 2C$

$C_2 = \frac{A \times \varepsilon \times 3 \times 2}{d}$

$C_2 = 6C$

$C_{eq} = \frac{2C \times 6C}{8C}$

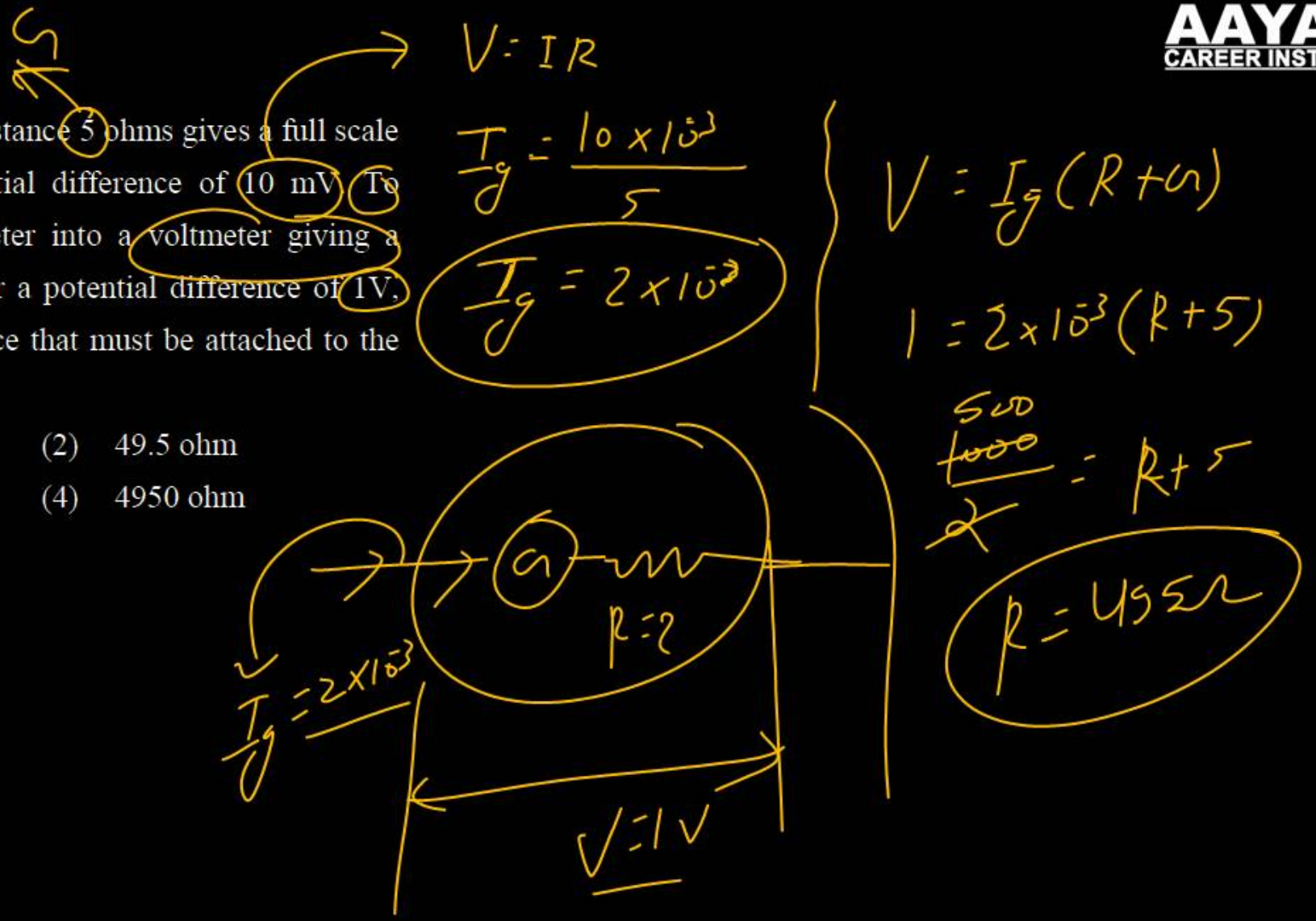
$C_{eq} = \frac{3C}{2} = \frac{3}{2} \times 4$

$C_{eq} = 6\,\mu F$

Question no. 21

A galvanometer of resistance 5 ohms gives a full scale deflection for a potential difference of 10 mV. To convert the galvanometer into a voltmeter giving a full scale deflection for a potential difference of 1V, the size of the resistance that must be attached to the voltmeter is

(1) 0.495 ohm
(2) 49.5 ohm
(3) 495 ohm
(4) 4950 ohm



Question no. 22

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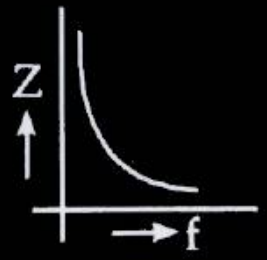
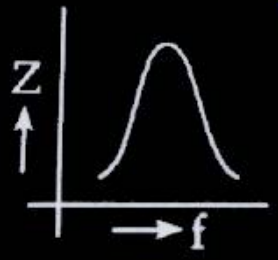
Which one of the following curves represents the variation of impedance (Z) with frequency in series LCR circuit?

$f_r \rightarrow Z_{min} \rightarrow I_{max}$

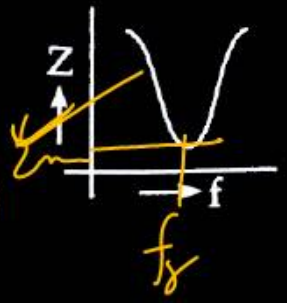
(1)



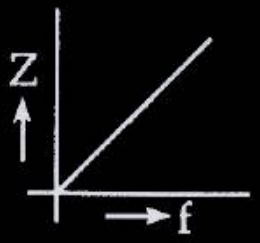
(2)



(3)



(4)



Question no. 23

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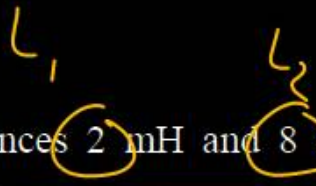


Two coils of self inductances 2 mH and 8 mH are placed so close together that the effective flux in one coil is completely linked with the other. The mutual inductance between these coils is

(1) 6 mH (2) 4 mH

(3) 16 mH (4) 10 mH

$$M = k\sqrt{L_1 L_2}$$

$$M = \sqrt{2 \times 8}$$

$$M = 4\,\text{mH}$$

Question no. 24

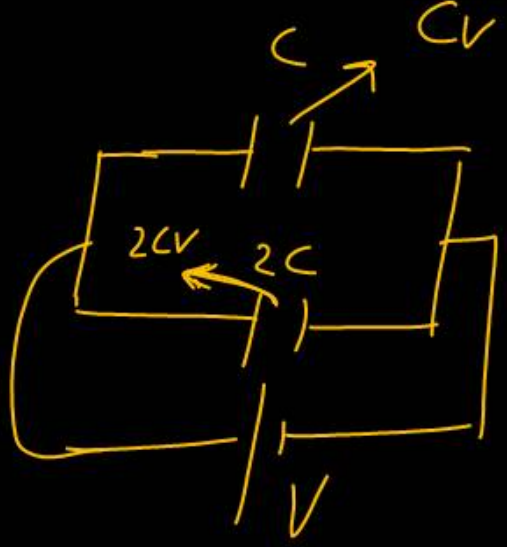
Two parallel plate capacitors of capacitance C and 2C are connected in parallel and charged to a potential difference V. The battery is then disconnected, and the region between the plates of C is filled completely with a material of dielectric constant K. The common potential difference across the combination becomes

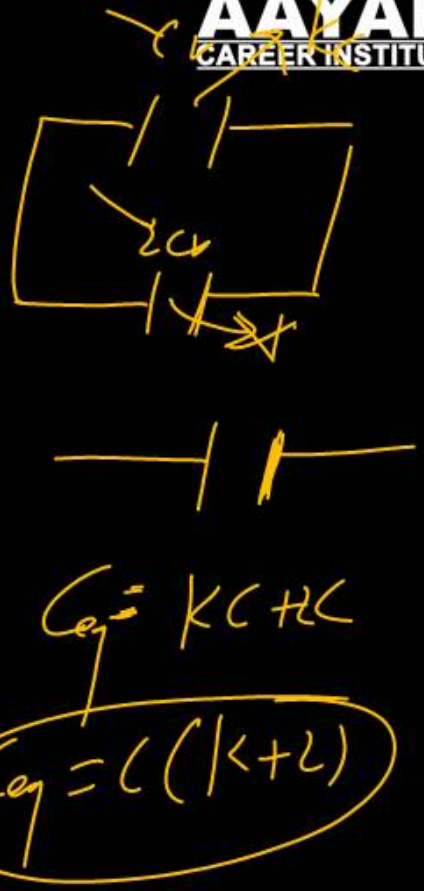
(1) $\frac{2V}{K+2}$

(2) $\frac{V}{K+2}$

(3) $\frac{3V}{K+3}$

(4) $\frac{3V}{K+2}$





$V_C = \frac{3CV}{C(K+2)} = \frac{3V}{K+2}$ | $V_C = \frac{q_T}{C_T}$

Question no. 25

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Two coherent monochromatic light beams of intensities I and 4 I are superimposed. The maximum and minimum possible intensities in the resulting beam are

(1) 5 I and I

(2) 5 I and 3 I

(3) 9 I and I

(4) 9 I and 3 I

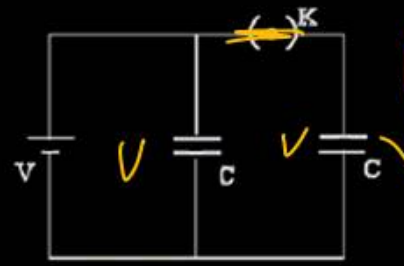
$I_{max} = (\sqrt{I_1} + \sqrt{I_2})^2$

$I_{max} = (3\sqrt{I})^2 = 9I$

$I_{min} = (\sqrt{I})^2 = I$

Question no. 26

A source of potential difference V is connected to the combination of two identical capacitors as shown in the figure. When key 'K' is closed the total energy stored across the combination is E_1. Now key 'K' is opened and dielectric of dielectric constant 5 is introduced between the plates of the both the capacitors. The total energy stored across the combination is now E_2. The ration E_1/E_2 will



(1) $\frac{1}{10}$

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

(3) $\frac{5}{13}$

(4) $\frac{5}{26}$

Question no. 27

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A solenoid of length 0.6 m has a radius of 2 cm and is made up of 600 turns. If it carries a current of 4 A then the magnitude of the magnetic field inside the solenoid is

(1) 6.024×10^{-3} T (2) 8.024×10^{-3} T

(3) 5.024×10^{-3} T (4) 7.024×10^{-3} T

$B_I = \mu_0 n I$

$B_I = 4\pi \times 10^{-7} \times \frac{600}{0.6} \times 4$

Question no. 28

AAYAM CAREER INSTITUTE

If an electron and a proton having same momenta enter perpendicular to a magnetic field, then

(1) curved path of electron and proton will be same (ignoring the sense of revolution)

(2) they will move undeflected

(3) curved path of electron is more curved than that of the proton

(4) path of proton is more curved

$R = \frac{mv}{qB}$

$R = \frac{p}{qB}$

$R_e = R_p$

Question no. 29

AAYAM CAREER INSTITUTE

A proton and α–particle enter a uniform magnetic field perpendicularly with the same speed. If proton takes 25 μ second to make 5 revolutions, then the time period for the α– particle would be

(1) 50 μ sec (2) 25 μ sec

(3) ~~10~~ μ sec (4) 5 μ sec

$T = \frac{mv}{qB}$

$T_p = 5 \times 10^{-6}\,s$

$T_\alpha = ?$

$T_p = \frac{m \times v}{e \times B}$

$T_\alpha = \frac{4m \times v}{2e \times B}$

$\frac{5\,\mu s}{T_\alpha} = \frac{1}{2}$

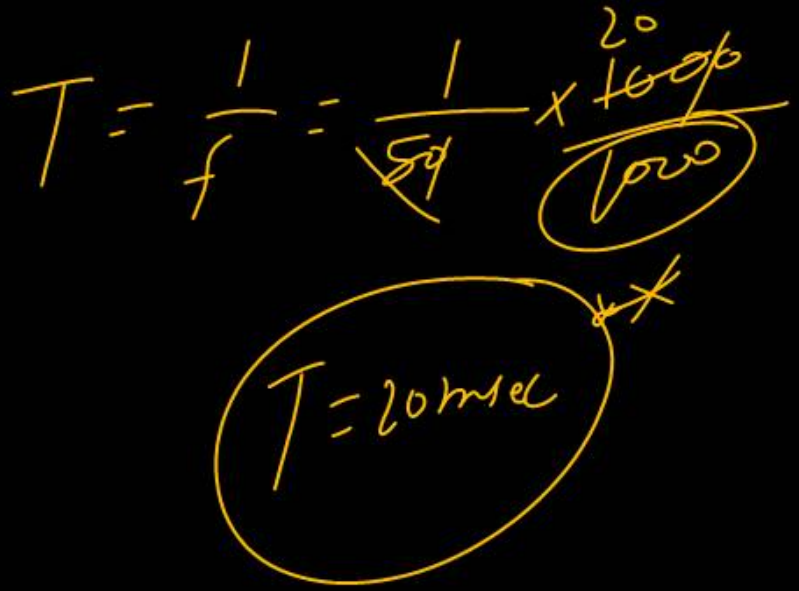
$T_\alpha = 10\,\mu sec$

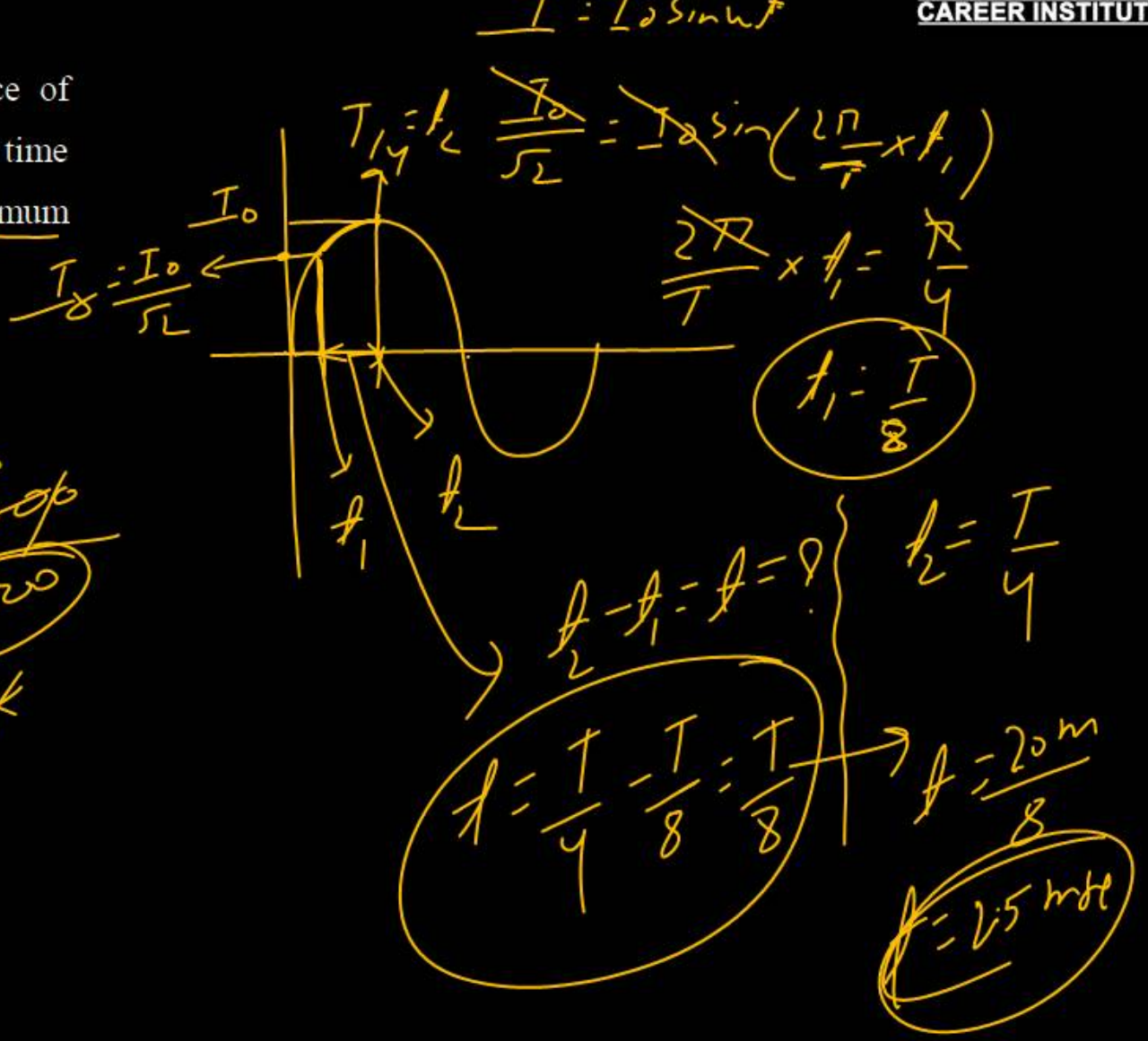
Question no. 30

A resistance of 40 Ω is connected to a source of alternating current rated 220 V, 50 Hz. Find the time taken by the current to change from its maximum value to rms value

(1) 2.5 ms (2) 1.25 ms

(3) 2.5 s (4) 0.25 s





Question no. 31

Two point charges placed in a medium of dielectric constant 5 are at a distance r between them, experience an electrostatic force 'F'. The electrostatic force between them in vacuum at the same distance r will be-

(1) 5F
(2) F
(3) F/2
(4) F/5

$F_{medium} = \frac{F_v}{K}$

$F = \frac{F_v}{5}$

$F_v = 5F$

$F_{med} = \frac{1}{4\pi\varepsilon_0} \frac{q_1 q_2}{r^2 K}$

$F_{med} = \left(\frac{1}{4\pi\varepsilon_0} \frac{q_1 q_2}{r^2}\right) \frac{1}{K}$

$F_{med} = \frac{F_v}{K}$

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Question no. 32

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If wattless current flows in the AC circuit, then the circuit is

(1) Purely Resistive circuit

(2) Purely Inductive circuit

(3) LCR series circuit

(4) RC series circuit only

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

$P = V_{rms} V_{rms} \cos\phi$

$P = 0$

Question no. 33

Sodium and copper have work functions 2.3 eV and 4.5 eV respectively. Then ratio of their threshold wavelengths is nearest to

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

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

$\phi_{Sodium} = 2.3\ eV$.

$\phi_{copper} = 4.5\ eV$

$\phi = \frac{hc}{\lambda_0}$

$\phi \propto \frac{1}{\lambda_0}$

$\frac{\phi_{sodium}}{\phi_{copper}} = \frac{\lambda_{(0)copper}}{\lambda_{(0)sodium}}$.

$\frac{2.3}{4.5} = \frac{\lambda_{copper}}{\lambda_{sodium}}$.

$\frac{\lambda_{sodium}}{\lambda_{copper}} = \frac{4.5}{2.3}$

$= \frac{2}{1}$ (approx)

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Question no. 34

A step up transformer operates on a 230 V line and supplies a current of 2 ampere. The ratio of primary and secondary winding is 1 : 25. The current in primary is

(1) 25 A (2) 50 A

(3) 15 A (4) 12.5 A

$\frac{N_P}{N_S} = \frac{1}{25}$

$\frac{N_S}{N_P} = \frac{25}{1}$

$I_P = ?$

$\frac{I_P}{I_S} = \frac{N_S}{N_P}$

$\frac{I_P}{2} = \frac{25}{1}$

$I_P = 50\,A$

$I_p = 50\,A$

Question no. 35

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In the case of an inductor

(1) voltage lags the current by $\frac{\pi}{2}$

(2) voltage leads the current by $\frac{\pi}{2}$

(3) voltage leads the current by $\frac{\pi}{3}$

(4) voltage leads the current by $\frac{\pi}{4}$

Question no. 36

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If the kinetic energy of the particle is increased to 16 times its previous value, the percentage change in the de-Broglie wavelength of the particle is:

(1) 25 (2) 75

(3) 60 (4) 50

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

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

$\frac{\lambda_2}{\lambda_1} = \sqrt{\frac{K}{16K}}$

$\frac{\lambda_2}{\lambda_1} = \frac{1}{4}$

$1 - \frac{\lambda_2}{\lambda_1} = 1 - \frac{1}{4}$

$\frac{\lambda_1 - \lambda_2}{\lambda_1} = \frac{4-1}{4}$

$= \frac{3}{4} \times 100\%$

$= 75\%$

Question no. 37

Electromagnetic radiation falls on a metallic body whose work function is 2eV. For a particular radiation of frequency v, the maximum kinetic energy of the photoelectron is found to be 4eV. What would be the maximum kinetic energy of photoelectron for the radiation of frequency $\frac{5v}{3}$?

(1) $\frac{8}{3}$ eV

(2) 8 eV

(3) $\frac{10}{3}$ eV

(4) $\frac{20}{3}$ eV

$\phi = 2eV$

$K_1 = 4eV$

$h\upsilon = \phi + K_1$

$h\upsilon = 2 + 4$

$h\upsilon = 6(ev) - (1)$

$h \times \frac{5\upsilon}{3} = \phi + K_2$

$\frac{5}{3} h\upsilon = 2 + K_2$

$\frac{5}{3} \times 6 = 2 + K_2$

$10 = 2 + K_2 \Rightarrow K_2 = 8\ eV$

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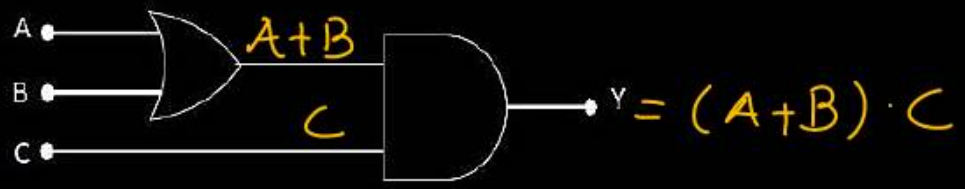
Question no. 38

To get output 1 for the following circuit, the correct choice for the input is



(1) A = 0, B = 1, C = 0

(2) A = 1, B = 0, C = 0

(3) A = 1, B = 1, C = 0

(4) A = 1, B = 0, C = 1

$Y = (A+B)\cdot C$

$= (0+1)\times 0$

$= 0$

$Y = (1+0)\cdot 0$

$Y = 0$

$Y = (1+1)\cdot 0$

$Y = 0$

$Y = (A+B)\cdot C$

$Y = (1+0)\cdot 1$

$Y = 1\cdot$

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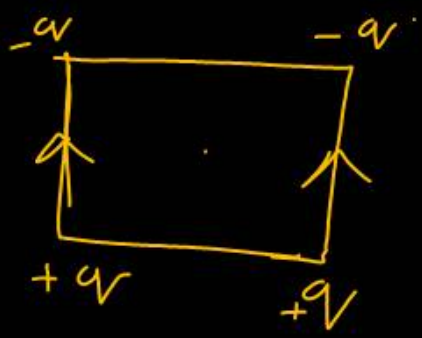
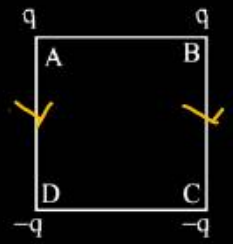
Question no. 39

$V = \frac{kq_{net}}{r}$



Charges are placed on the vertices of a square as shown.

Let $\vec{E}$ be the electric field and V the potential at the centre. If the charges on A and B are interchanged with those on D and C respectively, then



(1) $\vec{E}$ changes, V remains unchanged

(2) $\vec{E}$ remains unchanged, V changes

(3) both $\vec{E}$ and V changes

(4) $\vec{E}$ and V remain unchanged

Question no. 40

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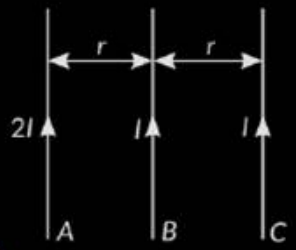
Three infinitely long parallel straight current carrying wires A, B and C are kept at equal distance from each other as shown in the figure. The wire C experiences net force F. The net force on wire C, when the current in wire A is reversed will be



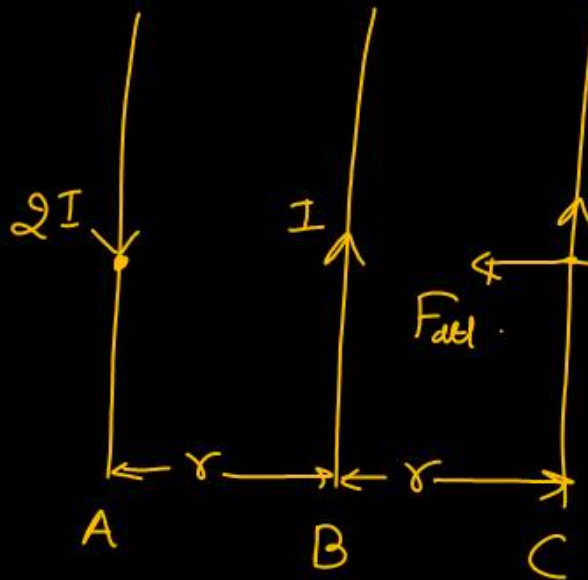
(1) Zero

(2) F/2

(3) F

(4) 2F

$\frac{\mu_0}{4\pi}\cdot\frac{2I_1I_2}{\gamma}$



$F_{Repel} = \frac{\mu_0}{4\pi}\frac{2I^2}{(2\gamma)}\times 2$

$F_{Repel} = \frac{\mu_0}{4\pi}\cdot\frac{2I^2}{\gamma}$

$F_{net} = \frac{\mu_0}{4\pi}\frac{2I^2}{\gamma}$

$F_{net} = \frac{\mu_0}{4\pi}\frac{2I^2}{\gamma} - \frac{\mu_0}{4\pi}\frac{I^2}{\gamma}$

$= 0$

Question no. 41

The magnetic flux linked with the coil (in Weber) is given by the equation–

$\phi = 5t^2 + 3t + 16$

The induced EMF in the coil at time, $t = 4$ will be –

(1) – 27 V (2) – 43 V

(3) – 108 V (4) 210 V

$$\mathcal{E} = -\frac{d\phi}{dt}$$

$$\mathcal{E} = -\frac{d}{dt}(5t^2 + 3t + 16)$$

$$\mathcal{E} = -(10t + 3)$$

$$\mathcal{E} = -(10 \times 4 + 3)$$

$$\mathcal{E} = -43 \text{ volt}$$

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Question no. 42

If radius of the $^{27}_{13}Al$ nucleus is estimated to be 3.6 fermi then the radius of $^{125}_{52}Te$ nucleus by nearly

(1) 8 fermi (2) 6 fermi

(3) 5 fermi (4) 4 fermi

$$R \propto A^{\frac{1}{3}}$$

$$\frac{R_{Te}}{R_{Al}} = \left(\frac{A_{Te}}{A_{Al}}\right)^{\frac{1}{3}}$$

$$\frac{R_{Te}}{3.6} = \left(\frac{125}{27}\right)^{\frac{1}{3}}$$

$$\frac{R_{Te}}{3.6} = \frac{5}{3}$$

$$R_{Te} = \frac{5 \times 3.6}{3} = 6$$

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Question no. 43

In a photoelectric effect experiment, for radiation with frequency υ_0 with $h\upsilon_0 = 8$ eV, electrons are emitted with energy 2 eV. What is the energy of the electrons emitted for incoming radiation of frequency $1.25\upsilon_0$?

(1) 1 eV

(2) 3.25 eV

(3) 4 eV

(4) 9.25 eV

$$h\upsilon = \phi + K$$

$$8 = \phi + 2$$

$$6 = \phi$$

$$h \times 1.25\upsilon_0 = \phi + k'$$

$$h\upsilon_0 \times 1.25 = \phi + k'$$

$$8 \times 1.25 = 6 + k'$$

$$10 - 6 = k'$$

$$k' = 4\,eV$$

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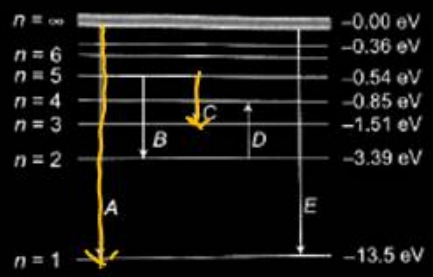
Question no. 44

The energy levels of the hydrogen spectrum is shown in figure. There are some transitions A, B, C, D and E. Transition A, B and C respectively represent



(1) first member of Lyman series, third spectral line of Balmer series and the second spectral line of Paschen series.

(2) ionization potential of hydrogen, second spectral line of Balmer series, third spectral line of Paschen series.

(3) series limit of Lyman series, third spectral line of Balmer series and second spectral line of Paschen series.

(4) series limit of Lyman series, second spectral line of Balmer series and third spectral line of Paschen series.

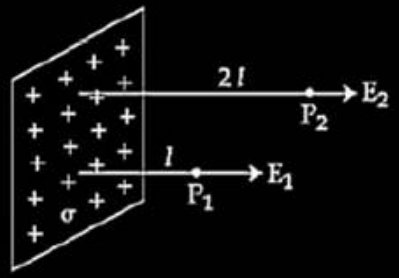
A → n = ∞ to n = 1 (limit of lyman series)

B → n = 5 to n = 2 (Balmar series) third spectral line

C → n = 5 to n = 3 Paschen series (Second spectral line)

Question no. 45

In the figure a very large plane sheet of positive charge is shown, P_1 and P_2 are two points at distance l and $2l$ from the charge distribution. If σ is the surface charge density, then the magnitude of electric fields E_1 and E_2 at P_1 and P_2 respectively are:



(1) $E_1 = \sigma/\varepsilon_0,\ E_2 = \sigma/2\varepsilon_0$

(2) $E_1 = 2\sigma/\varepsilon_0,\ E_2 = \sigma/\varepsilon_0$

(3) $E_1 = E_2 = \sigma/2\varepsilon_0$

(4) $E_1 = E_2 = \sigma/\varepsilon_0$

$$E = \frac{\sigma}{2\epsilon_0}$$

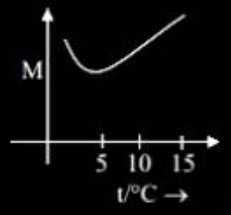
$$E_1 = E_2 = \frac{\sigma}{2\epsilon_0}$$

Question no. 46

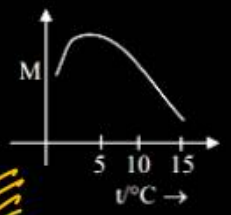
'x' of NaCl is added to water in a beaker with a lid. The temperature of the system is raised from 1°C to 25° C. Which out of the following plots, is best suited for the change in the molarity (M) of the solution with respect to temperature?

[Consider the solubility of NaCl remains unchanged over the temperature range]

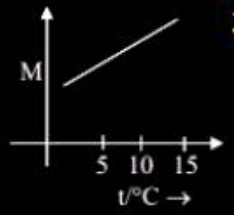
(1)



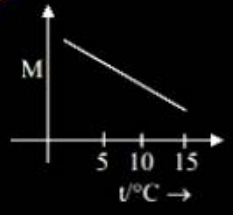
(2)



(3)



(4)



$$\text{Molarity}(M) = \frac{w}{M_w \times V_{lit}}$$

$T \uparrow$ $V \uparrow$ $M \downarrow$

$T \uparrow$ $M \downarrow$

$$\text{Solubility}(S) = \frac{w}{M_w \times V_{lit}}$$

$T \uparrow$ { solubility initially ↑, Molarity ↑

Then molarity further ↓

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Question no. 47

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During the charging of lead storage battery, the reaction at anode is represented by

(1) $Pb^{2+} + SO_4^{2-} \longrightarrow PbSO_4$

(2) $PbSO_4 + 2H_2O \longrightarrow PbO_2 + SO_4^{2-} + 4H^+ + 2e^-$

(3) $Pb \longrightarrow Pb^{2+} + 2e^-$

(4) $Pb^{2+} + 2e^- \longrightarrow Pb$

Question no. 48

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Identify the law which is stated as:

"For any solution, the partial vapour pressure of each volatile component in the solution is directly proportional to its mole fraction."

(1) Henry's law

(2) Raoult's law

(3) Dalton's law

(4) Gay–Lussac's law

$P_A \propto X_A$

$P_A = P_A^\circ X_A$

Raoult's law

Question no. 49

The electrode potential $E_{(Zn^{2+}/Zn)}$ of a zinc electrode at 25°C with an aqueous solution of 0.1 M $ZnSO_4$ is $\left(\text{Given } -E^{\circ}_{Zn^{2+}/Zn} = -0.76V\right)$.

(1) + 0.73 (2) − 0.79

(3) − 0.82 (4) − 0.70

$$E_{cell} = E^{\circ}_{cell} - \frac{0.059}{n}\log_{10}[Zn^{+2}]$$

$$E_{cell} = -0.76 - \frac{0.06}{2}\log\frac{1}{0.1}$$

$$= -0.76 - 0.03\log\frac{1}{10^{-1}} = 10^{\frac{1}{1}}$$

$$= -0.76 - 0.03 \times 1 \qquad \log 10 = 1$$

$$E_{cell} = -0.79$$

$Zn^{+2} + 2e^- \longrightarrow Zn(s)$

R: $= 0.1$ n = 2 P: 1

Question no. 50

The resistance of a conductivity cell with cell constant 1.4 cm^{-1}. containing 0.001 MKCl at 298 K is 1500 Ω. The molar conductivity of 0.001 MKCl solution at 298 K in S cm^2 mol^{-1} is .

(1) 86 (2) 860

(3) 920 (4) 760

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

$$K = \frac{1}{R} \cdot \times \text{cell const} = \frac{1}{1500} \times 1.4$$

$$\Lambda_m = \frac{\frac{1}{1500} \times 1.4 \times 1000}{0.001 = 10^{-3}}$$

$$\Lambda_m = \frac{2.8}{3 \times 10^{-3}}$$

$$= \frac{2.8 \times 10^3}{3} = \frac{2800}{3}$$

$$\simeq 930$$

$$\simeq 920$$

Question no. 51

Which of the following elements have half–filled f – orbitals in their ground state?

A. Sm
B. Eu
C. Tb
D. Gd
E. Pm

Choose the correct answer from the options given below:

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

1

Tm Yb
69 70 71

Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er
58 59 60 61 62 63 64 65 66 67 68

$Sm\ z=62 = [Xe]_{54}\ 6s^2\ 4f^6$

$Eu\ z=63 = [Xe]_{54}\ 6s^2\ 4f^7$

$Gd\ z=64 = [Xe]_{54}\ 6s^2\ 4f^7\ 5d^1$

Question no. 52

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Which of the following compounds show optical isomerism?

(1) $[Co(CN)_6]^{3-}$ (2) $[Cr(C_2O_4)_3]^{3-}$

(3) $[ZnCl_4]^{2-}$ (4) $[Cu(NH_3)_4]^{2+}$

2

① Ma_6

② $[M(AA)_3]$

③ Ma_4

④ Ma_4

$Ma_2b_2c_2$

Ma_2b_2cd

Ma_2bcde

$Mabcdef$

$M(AA)abcd$

$M(AA)_2a_2$

$M(AA)_2ab$

$M(AA)_3$

$M(AB)_3$

Question no. 53

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Which of the following statements are correct about $Cr_2O_7^{2-}$?

(A) It contains 6 Cr–O bonds.

(B) It contains 4 Cr=O bonds.

(C) The oxidation state of Cr is + 6.

(D) It contains 2 Cr–O–Cr bonds.

(E) It contains 1 Cr–O–Cr bond.

Choose the correct answer from the options given below:

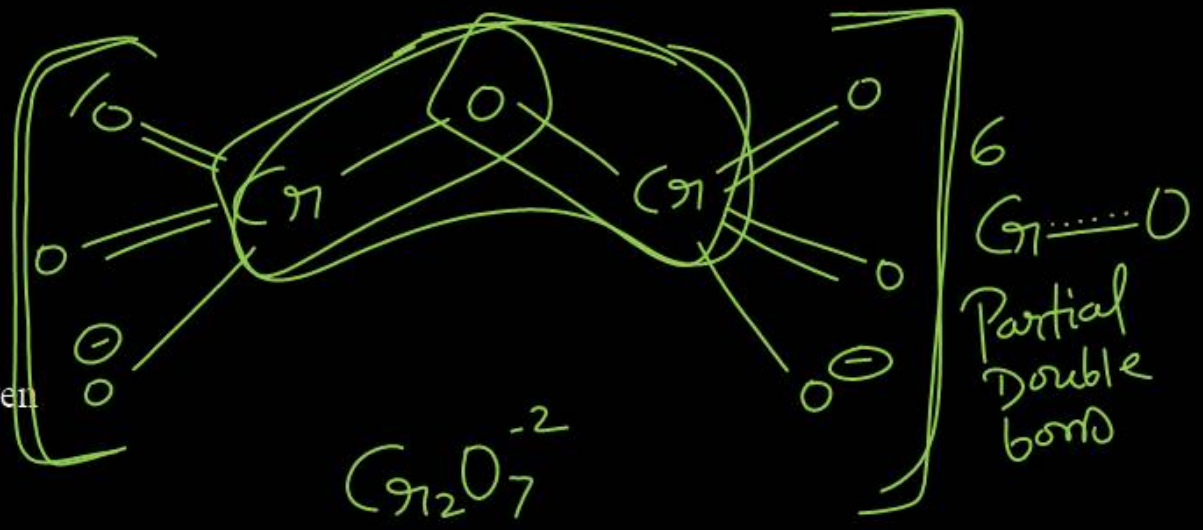
(1) (A) and (D)

(2) (A), (C) and (E)

(3) (B) and (E)

(4) (B) and (C)

2



2 Types of Cr—O Bond

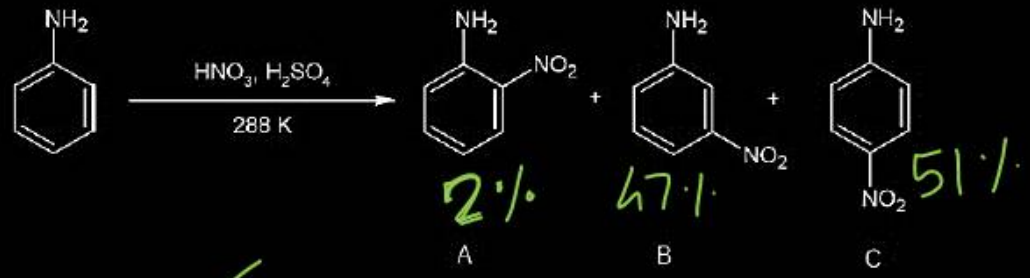
2 Cr—O

6 Cr⋯⋯O

Question no. 54

AAYAM CAREER INSTITUTE

Consider the given reaction, and arrange the products in correct order of their precentage yield :



2% 47% 51%

(1) C > B > A

(2) C > A > B

(3) B > C > A

(4) A > C > B

C > B > A

(1)

Question no. 55

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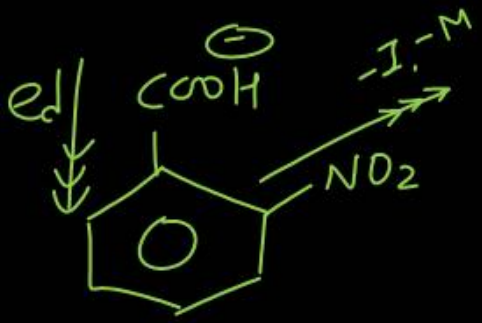
Which of the following has the maximum acidic strength?

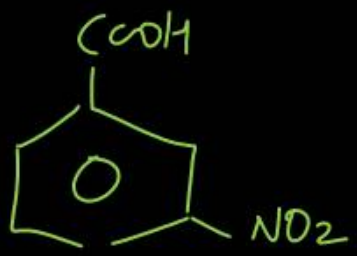
(1) o–nitrobenzoic acid

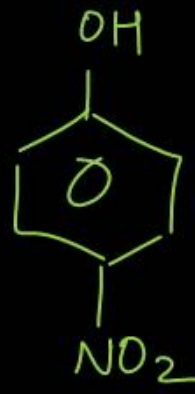
(2) m–nitrobenzoic acid

(3) p–nitrobenzoic acid

(4) p–nitrophenol







(1)

Question no. 56

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Which of the following correct?

(A) d (–) fructose exist in furanose structure.

(B) d (+) glucose exist in pyranose structure.

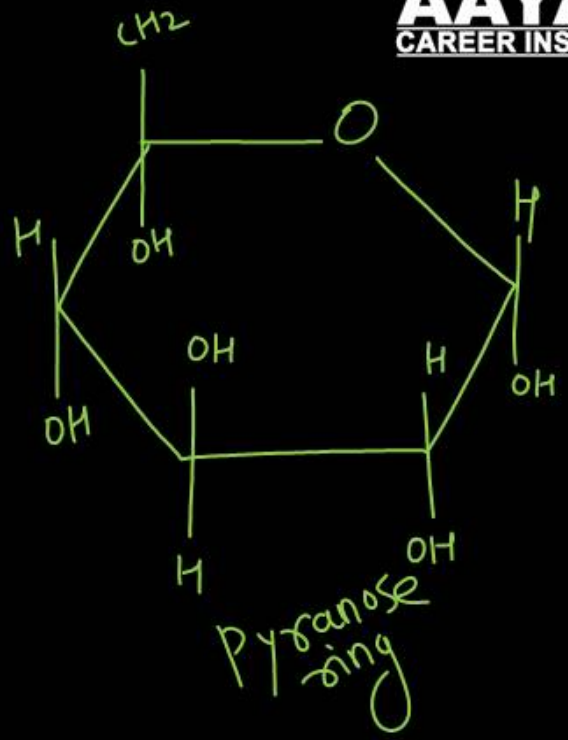
(C) In sucrosetwo monosachcharides are held together by peptide linkage. Glycosidic

(D) Maltose is a reducing sugar

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

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

2



Question no. 57

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Given below are two statements :–

Statement I : The boiling points of aldehydes and ketones are higher as compared to hydrocarbons of comparable molecular masses because of weak molecular association in aldehydes and ketones due to dipole –dipole interactions.

Statement I : The boiling points aldehydes and ketones are lower than the alcohols of similar molecular masses due to the absence of H–bonding.

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

(1) Both statements I and II are false

(2) Statement I is true but statement II is false.

(3) Statement II is true but statement I is false.

(4) Both statements I and II are true

Alkane < Aldehyde & ketone
C–C C–O
Polar
Dipole
B.Pt ↑

(4)

Dipole-Dipole H-Bonding

Alkane < Aldehyde & ketone < alcohol < C.acid

Question no. 58

AAYAM CAREER INSTITUTE

Compound A and C in following reaction are .....

$$CH_3CHO \xrightarrow[(ii)\ H_2O]{(i)\ CH_3MgBr} (A) \xrightarrow{H_2SO_4,\Delta} (B)$$

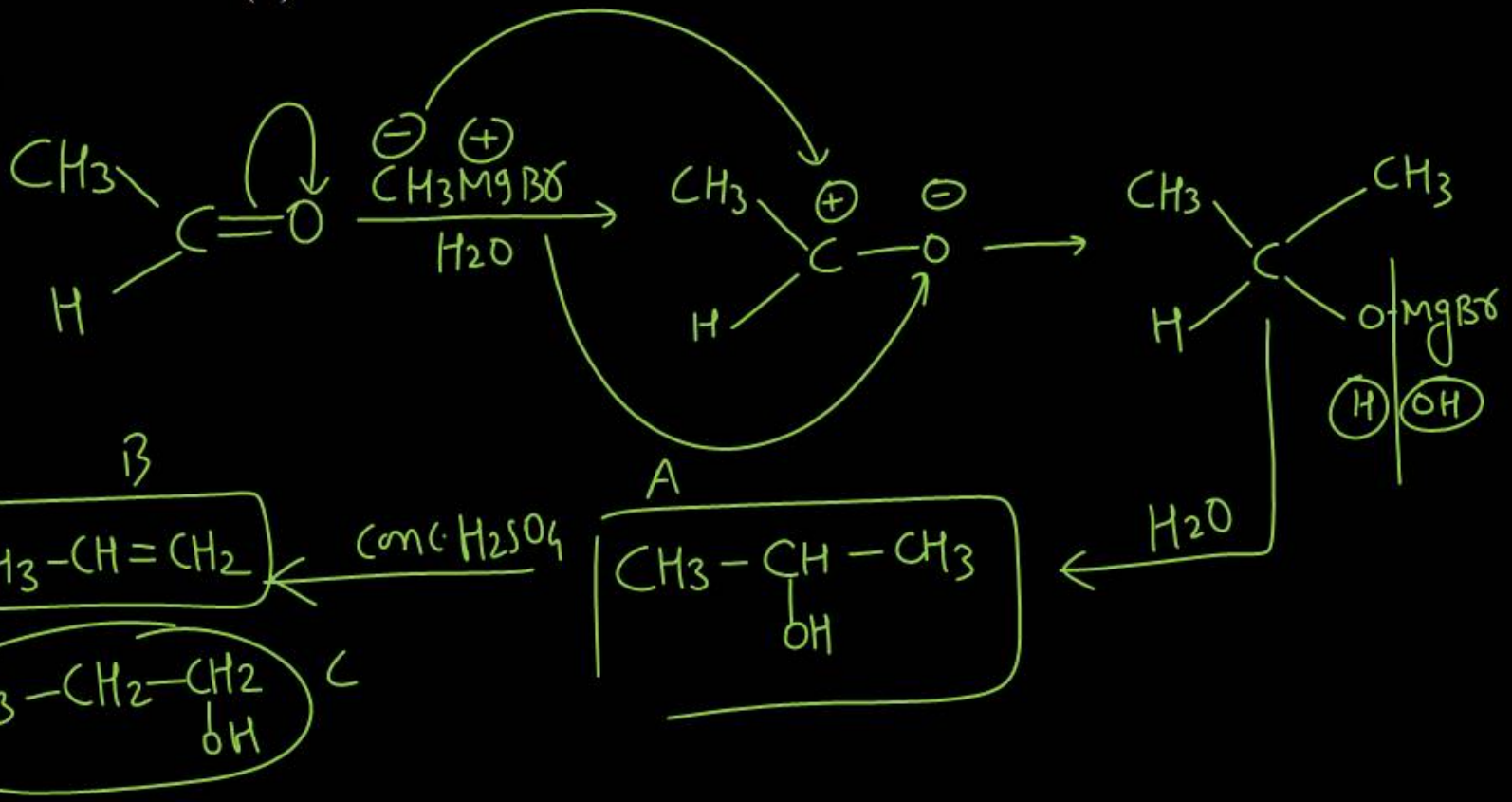
$$\xrightarrow{\text{Hydroboration oxidation}} (C)$$

(1) identical

(2) positional isomers

(3) functional isomers

(4) optical isomers



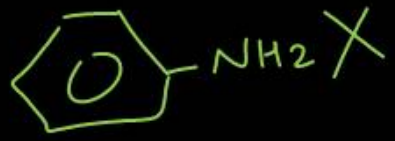
Question no. 59

AAYAM CAREER INSTITUTE

Which of the following reactions are used in the preparation of aliphatic & aromatic primary amines?

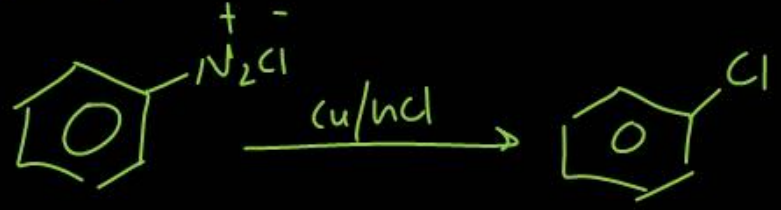
(A) Gabriel – phthalimide direction. S_N2 $R-NH_2$

(B) Hoffmann Bromamide reaction. 1° amine



(C) ~~Carbylamine reaction~~

(D) ~~Sandmayer reaction~~



(E) ~~Gatterman reaction~~

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

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

2

Question no. 60

AAYAM CAREER INSTITUTE

Among the following coordination compounds/ions

Which species exhibit geometrical isomerism?

(A) $[Fe(CN)_6]^{3-}$ (B) $[Pt(NH_3)_2Cl_2]$

(C) $[Co(NH_3)_6]^{3+}$ (D) $[Cr(H_2O)_6]Cl_3$

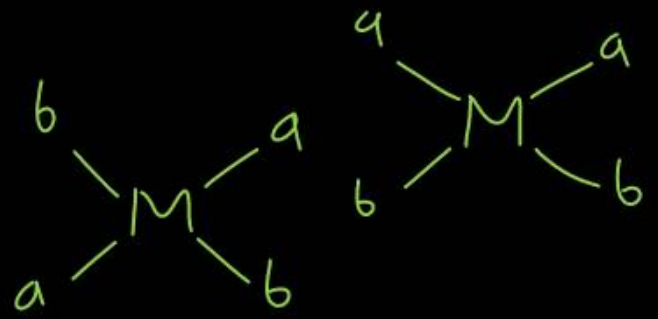
(1) (B) only (2) (A) and (B)

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

1

(a) Ma_6

(B) Ma_2b_2



(aa)(bb) — 1

(ab)(ab) — 2

Question no. 61

AAYAM CAREER INSTITUTE

Statement I : Reactions with the molecularity three are very rare and slow to proceed.

Statement II : Complex reactions involving more than three molecules take place in more than one step.

(1) Both statement I and II are true.

(2) Both statement I and II are false.

(3) Statement I is true but statement II is false.

(4) Statement II is true but statement I is false.

Question no. 62

AAYAM CAREER INSTITUTE

Given below are two statements:

Statement I : In octahedral complexes, when $\Delta_o < P$ high spin complexes are formed. When $\Delta_o > P$ low spin complexes are formed.

Statement II : In tetrahedral complexes because of $\Delta_t < P$, low spin complexes are rarely formed.

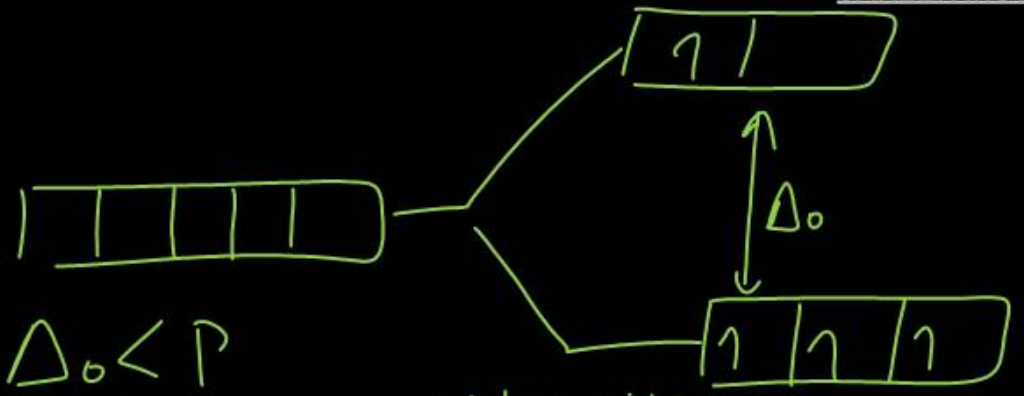
In the light of the above statements, choose the most appropriate answer from the options given below:

(1) Both statement I and II are true.

(2) Both statement I and II are false.

(3) Statement I is true but statement II is false.

(4) Statement II is true but statement I is false.



Question no. 63

The chemical reaction $2O_3 \longrightarrow 3O_2$ proceeds as follows:

$$O_3 \xrightarrow{\text{Fast}} O_2 + O; \quad (A)$$

$$O + O_3 \xrightarrow{\text{Slow}} 2O_2 \quad (B)$$

the rate law expression should be

(1) $r = k[O_3]^2$ (2) $r = k[O_3]^2[O_2]^{-1}$

(3) $r = k^3 [O_3][O_2]^2$ (4) $r = [O_3][O_2]^2$

$$\text{Rate} = k[O][O_3]$$

$$\frac{k_f}{k_b} = \frac{[O_2][O]}{[O_3]}$$

$$\frac{k_f [O_3]}{k_b [O_2]} = [O]$$

$$\text{Rate} = k \frac{[O_3]}{[O_2]} [O_3]$$

$$\boxed{\text{Rate} = k [O_3]^2 [O_2]^{-1}}$$

AAYAM CAREER INSTITUTE

Question no. 64

AAYAM CAREER INSTITUTE

One mole of the complex compound $Co(NH_3)_5Cl_3$ gives 3 moles of ions on dissolution in water. One mole of the same complex reacts with two moles of $AgNO_3$ solution to yield two moles of AgCl (s). The formula of the complex is

(1) $[Co(NH_3)_3Cl_3].\ 2\ NH_3$ ✗

(2) $[Co(NH_3)_4Cl_2]\ Cl.\ NH_3$ 2 ions

(3) $[Co(NH_3)_4Cl]\ Cl_2.\ NH_3$ 3 ions

(4) $[Co(NH_3)_5\ Cl]\ Cl_2$ 3 ions ✓

(4)

Question no. 65

Statement I : Normality of solution decreases, if temperature of the solution increases ✓

Statement II : Molality of the solution increases if temperature of the solution increases ✗

(1) Both statement I and II are true.

(2) Both statement I and II are false.

(3) Statement I is true but statement II is false.

(4) Statement II is true but statement I is false.

$N = \frac{w}{E \times V_{lit}}$ T↑ V↑ N↓

$m = \frac{w_B \times 1000}{M_B \times w_A}$

↳ volume तो है

↳ No effect of temp.

Question no. 66

For a first order reaction A → B, the rate constant, $k = 5.5 \times 10^{-14}\ s^{-1}$. The time required for 67% completion of reaction is $x \times 10^{-1}$ times the half life of the reaction. The value of x is _____

(1) 16 (2) 47

(3) 67 (4) 55

$$t_{1/2} = \frac{0.693}{k} = \frac{0.693}{5.5 \times 10^{-14}}$$

$$t = \frac{2.303}{k} \log_{10} \frac{100}{33} \quad 3$$

$$t = \frac{2.303}{k} \times 0.5$$

$$t = \frac{2.303}{5.5 \times 10^{-14}} \times 0.5$$

$$x \times \frac{0.693}{5.5 \times 10^{-14}} = \frac{2.303}{5.5 \times 10^{-14}} \times 0.5$$

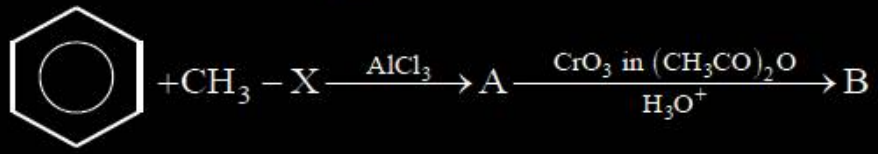
$$x = \frac{0.5}{0.3} = 5/3 = 1.6$$

$$x = 1.6 = 16 \times 10^{-1}$$

Question no. 67

AAYAM CAREER INSTITUTE

Find out B in the given reactions



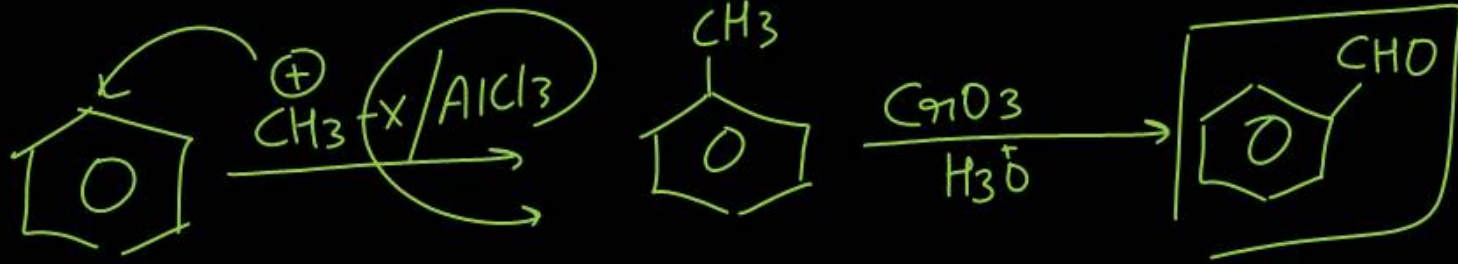
(1) acetophenone

(2) benzaldehyde

(3) cyclohexyl carbaldehyde

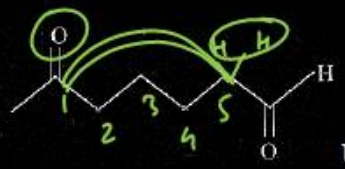
(4) benzoic acid

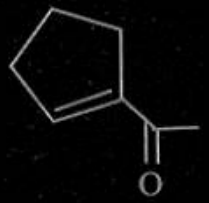
2

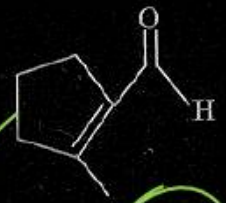


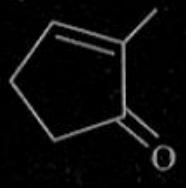
Question no. 68

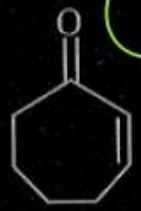
AAYAM CAREER INSTITUTE

When  undergoes intramolecular aldol condensation, the major product formed is:

(1) 

(2) 

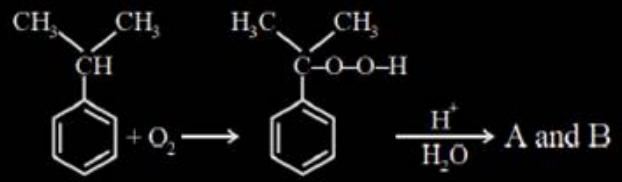
(3) 

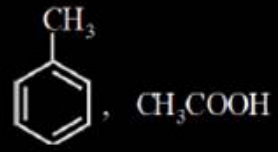
(4) 

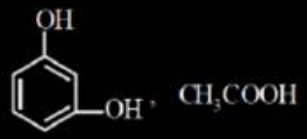
Question no. 69

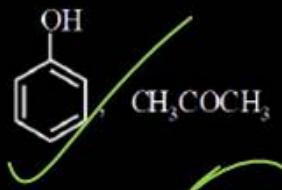
AAYAM CAREER INSTITUTE

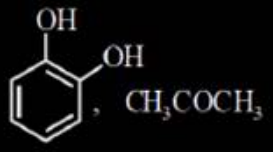
In the following reaction: The compounds A and B respectively are:



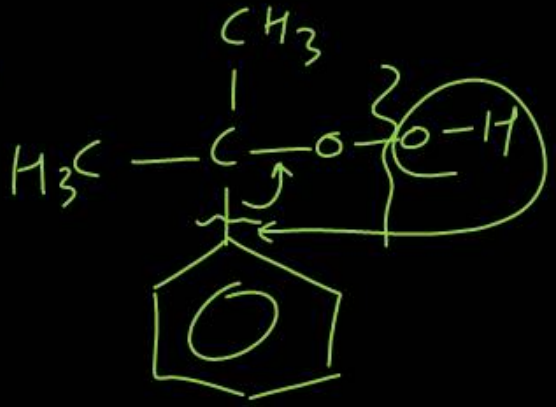
(1)  , CH_3COOH

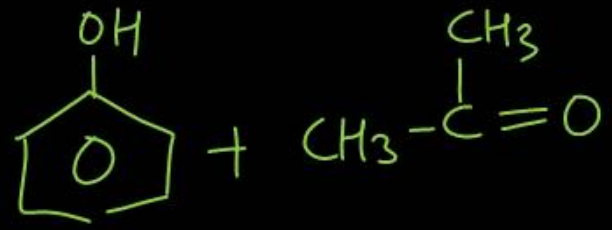
(2)  , CH_3COOH

(3)  , CH_3COCH_3

(4)  , CH_3COCH_3

3

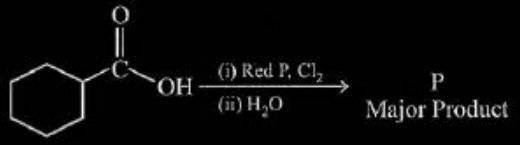




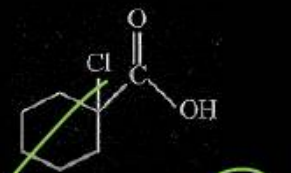
Question no. 70

AAYAM CAREER INSTITUTE

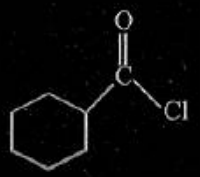
Consider the given chemical reaction and identify the product P.



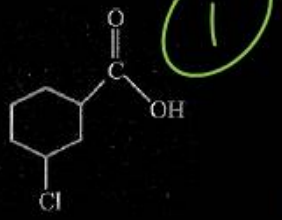
(1)



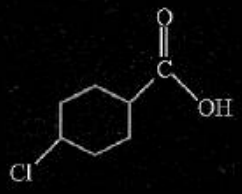
(2)



(3)



(4)



Question no. 71

A substance 'A' decomposes by a first order reaction starting initially with [A] = 2.00 M and after 200 min, [A] becomes 0.15 M. For this reaction $t_{1/2}$ is

(1) 53.72 min (2) 50.49 min

(3) 48.45 min (4) 46.45 min

$$k = \frac{2.303}{t} \log_{10} \frac{[A_0]}{[A]}$$

$$= \frac{2.303}{200} \log \frac{2}{0.15}$$

$$\frac{200}{15} = 13$$

$$= \frac{2.303}{200} \log 13.3$$

$$= \frac{2.303}{200} \log 1.3 \times 10^1$$

$$= \frac{2.303}{200} [\log 1.3 + \log 10] \quad (\log 10 = 1)$$

$$= \frac{2.303}{200} [0.1 + 1]$$

$$k = 0.012$$

$$t_{1/2} = \frac{0.693}{k} = \frac{0.693}{0.012}$$

$$= 53.5$$

Question no. 72

AAYAM CAREER INSTITUTE

Which of the following statement are correct?

(A) Lower aliphatic amines are soluble in water.

(B) Solubility increases with increase in molar mass of amines.

(C) Higher amines are insoluble in water.

(D) Amines are soluble in organic solvents.

(E) Lower aliphatic amines are gases with fishy odour.

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

(2) (A), (C), (D) and (E)

(3) (B), (C) and (E)

(4) (A) and (D)

CH_3NH_2, $CH_3CH_2NH_2$

$R-NH_2 \cdots OH_2$

$R-NH \cdots OH_2$

$R-\underset{\underset{R}{|}}{N}-R$

2

Question no. 73

AAYAM CAREER INSTITUTE

Value of Henry's constant K_H ……..

(1) increases with increase in temperature

(2) decreases with increase in temperature

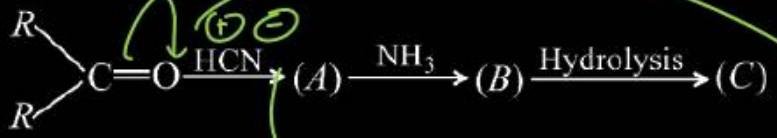
(3) remains constant with increase in temperature

(4) first increases then decreases with increase in temperature

Question no. 74

AAYAM CAREER INSTITUTE

Compound (C) in below reaction is



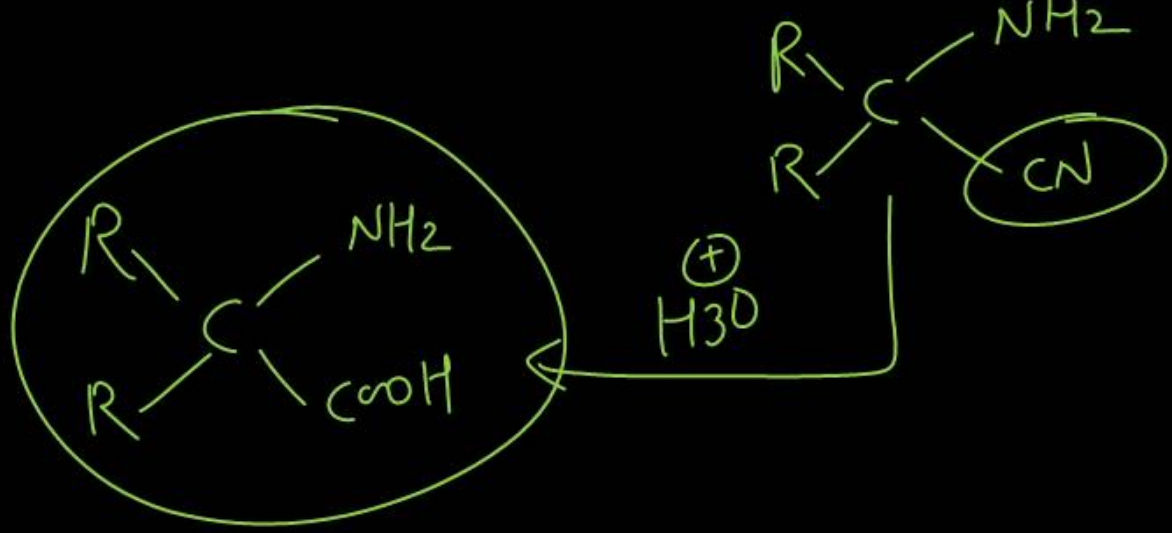
(1) α – hydroxy acid

(2) α – amino acid

(3) α – amino alkanol

(4) α – amino β –hydroxy acid

2



Question no. 75

AAYAM CAREER INSTITUTE

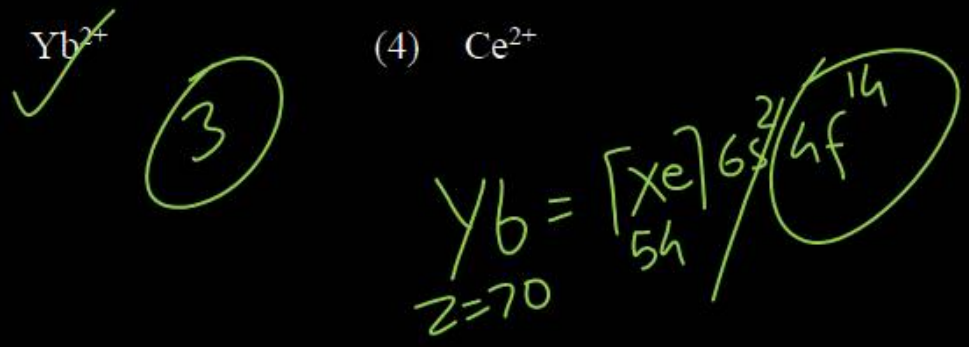
Which of the following lanthanoid ions is diamagnetic?

(1) Sm^{2+}

(2) Eu^{2+}

(3) Yb^{2+}

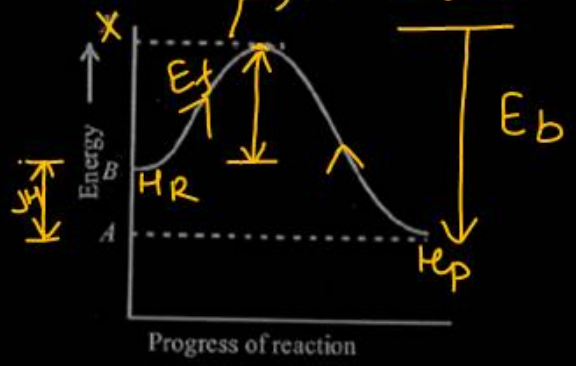
(4) Ce^{2+}



Question no. 76

AAYAM CAREER INSTITUTE

Consider the reaction B → A and Match the List–I with List–II.



	List–I		List–II
(A)	X–A	(i)	Enthalpy of reaction
(B)	X–B	(ii)	Energy of transition state
(C)	A–B	(iii)	Activation energy of forward reaction
(D)	X	(iv)	Activation energy of backward reaction.

(1) A–(iv), B–(iii), C–(ii), D–(i)

(2) A–(ii), B–(iii), C–(i), D–(iv)

(3) A–(iii), B–(iv), C–(i), D–(ii)

(4) A–(iv), B–(iii), C–(i), D–(ii)

Question no. 77

AAYAM CAREER INSTITUTE

Which of the following cannot be made by using Williamson's synthesis?

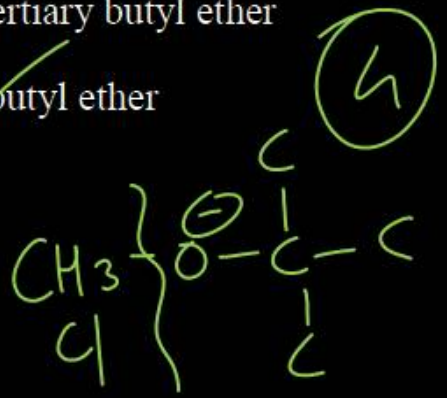
S_N2 / 1° alkyl Halide

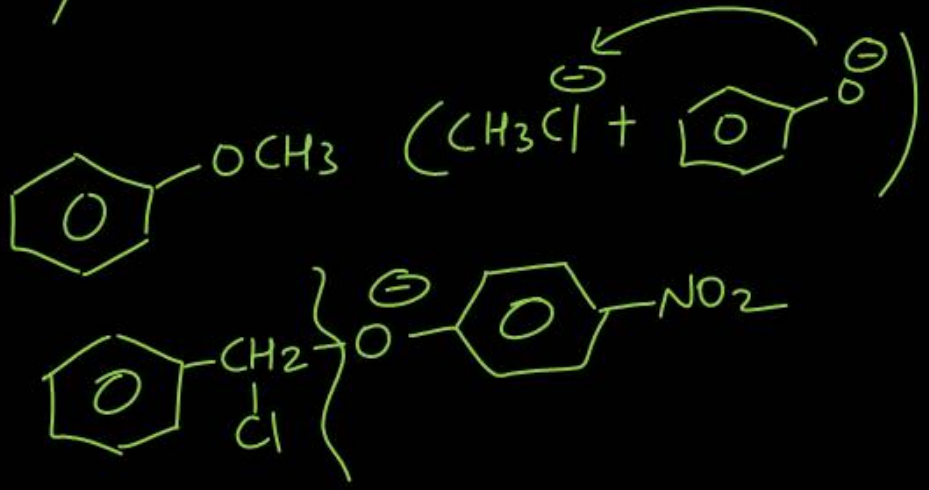
(1) Methoxybenzene

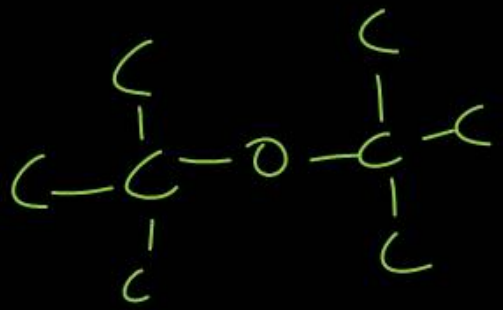
(2) Benzyl p–nitrophenyl ether

(3) Methyl tertiary butyl ether

(4) Di–tert–butyl ether







Question no. 78

AAYAM CAREER INSTITUTE

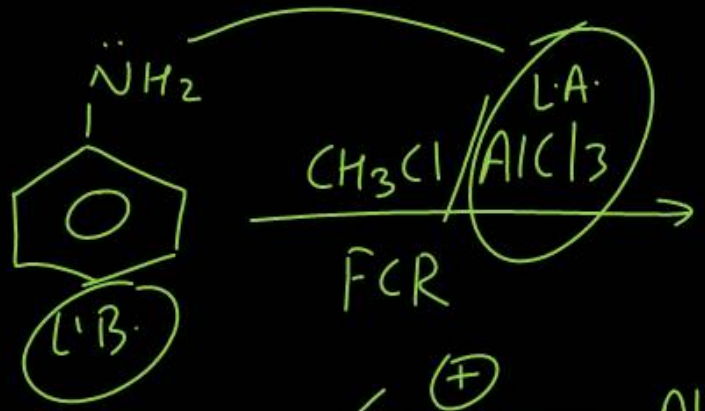
In Friedel – Crafts alkylation of aniline, one gets:

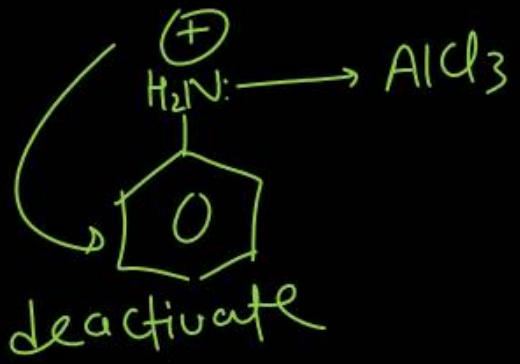
(1) alkylated product with ortho and para substitution.

(2) secondary amine after acidic treatement.

(3) an amide product.

(4) positively charged nitrogen at benzene ring.





Question no. 79

AAYAM CAREER INSTITUTE

Arrange the following compounds in increasing order of boiling point.

Propan–1–ol, butan–1–ol, butan – 2 – ol, pentan –1–ol

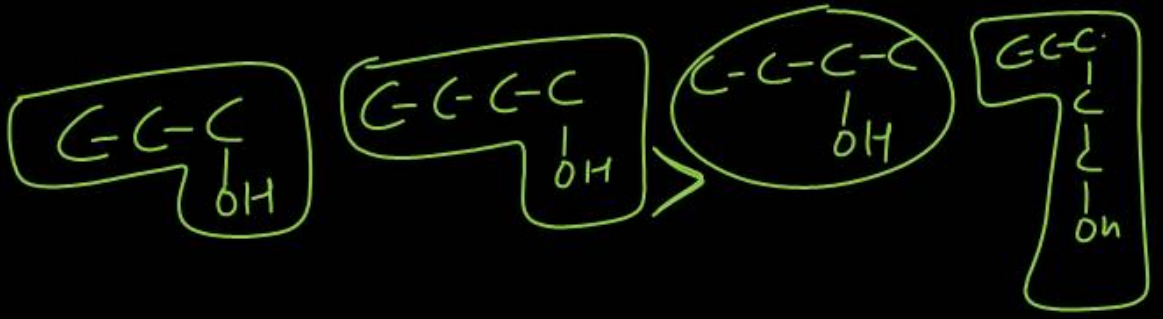
(1) Propan – 1–ol, butan – 2–ol, butan –1–ol, pentan–1–ol

(2) ~~Propan – 1–ol, butan –1–ol, butan – 2–ol , pentan – 1–ol~~

(3) Pentan – 1 – ol, butan – 2 – ol, butan – 1 – ol, ~~propan–1–ol~~

(4) Pentan – 1 – ol, butan – 1–ol, butan – 2–ol, ~~propan – 1–ol~~

B.Pt $\propto$ mol.wt $\propto$ Branching $\propto$ H-Banding



Question no. 80

AAYAM CAREER INSTITUTE

The reagents that can be used to convert benzenediazonium chloride to benzene are _____.

(A) $SnCl_2/HCl$

(B) CH_3CH_2OH

(C) H_3PO_2

(D) $LiAlH_4$

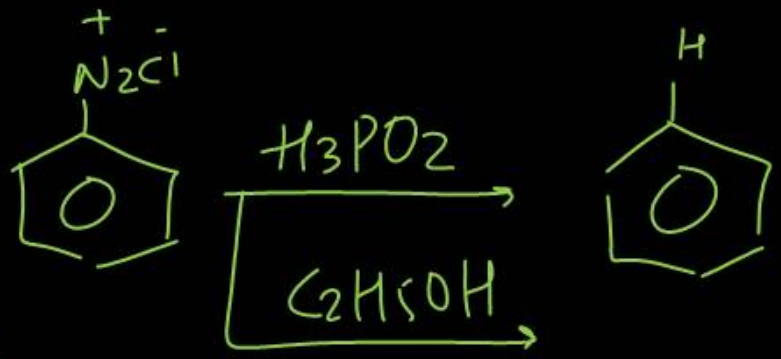
(E) HBF_4

(1) (A) and (B)

(2) (B) and (C)

(3) (C) and (E)

(4) (A) and (C)



Question no. 81

AAYAM CAREER INSTITUTE

In the electrolytic cell, flow of electrons is from

(1) cathode to anode in solution

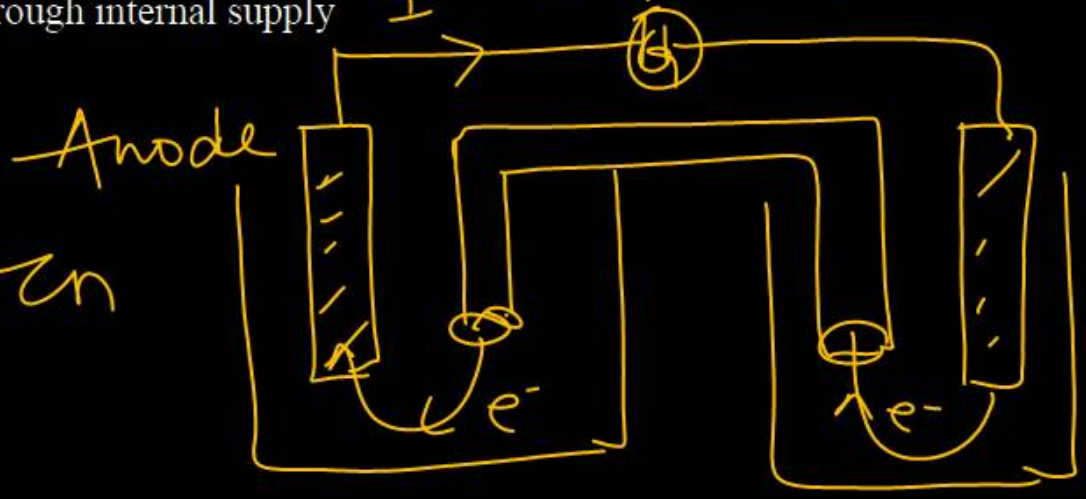
(2) cathode to anode through external supply

(3) cathode to anode through internal supply

(4) anode to cathode through internal supply

Anode → Cathode → Current ↓ External Supply

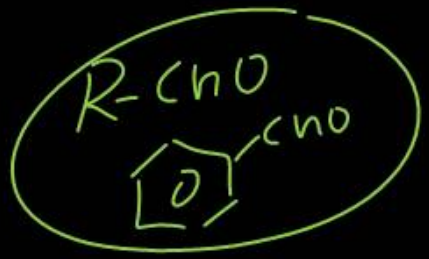
e^- flow → Cathode → Anode ↓ Internal Supply



Question no. 82

AAYAM CAREER INSTITUTE

Statement I: Tollen's reagent gives a positive result with all aldehydes.



Statement II : Tollen's reagent gives a negative result with all ketones.

(1) Both statement I and II are true.

(2) Both statement I and II are false.

(3) Statement I is true but statement II is false.

(4) Statement II is true but statement I is false.

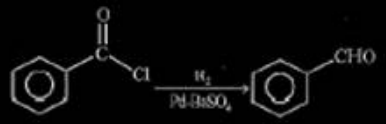
Question no. 83

AAYAM CAREER INSTITUTE

Match the List–I with List–II.

List–I

(A) $RCN \xrightarrow[(ii)\ H_3O^+]{(i)\ SnCl_2,\ HCl} RCHO$

(B) 

(C) 

(D) 

List–II

(i) Etard reaction

(ii) Gatterman –Koch reaction.

(iii) Rosenmund reduction

(iv) Stephen reaction

Choose the correct answer from the options given below:

(1) A–(iv), B–(iii), C–(i), D–(ii)

(2) A–(iii), B–(iv), C–(ii), D–(i)

(3) A–(i), B–(iii), C–(ii), D–(iv)

(4) A–(iii), B–(iv), C–(i), D–(ii)

In most cases, for a rise of 10 K temperature, the rate constant is doubled. This is due to the reason that

(1) collision frequency increases by a factor of 2.

(2) fraction of molecules possessing threshold energy increases by a factor of 2.

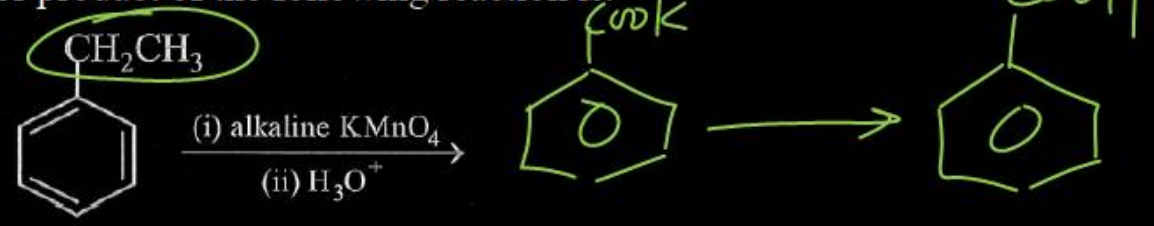
(3) activation energy is lowered by a factor of 2.

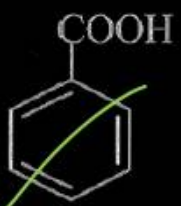
(4) (1), (2) and (3)

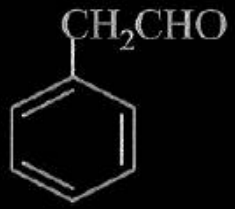
Question no. 85

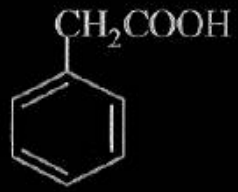
AAYAM CAREER INSTITUTE

The major product of the following reaction is:



(1) 

(2) 

(3) 

(4) 

1

Question no. 86

AAYAM CAREER INSTITUTE

The major product of the reaction between tert–butyl chloride and sodium ethoxide is

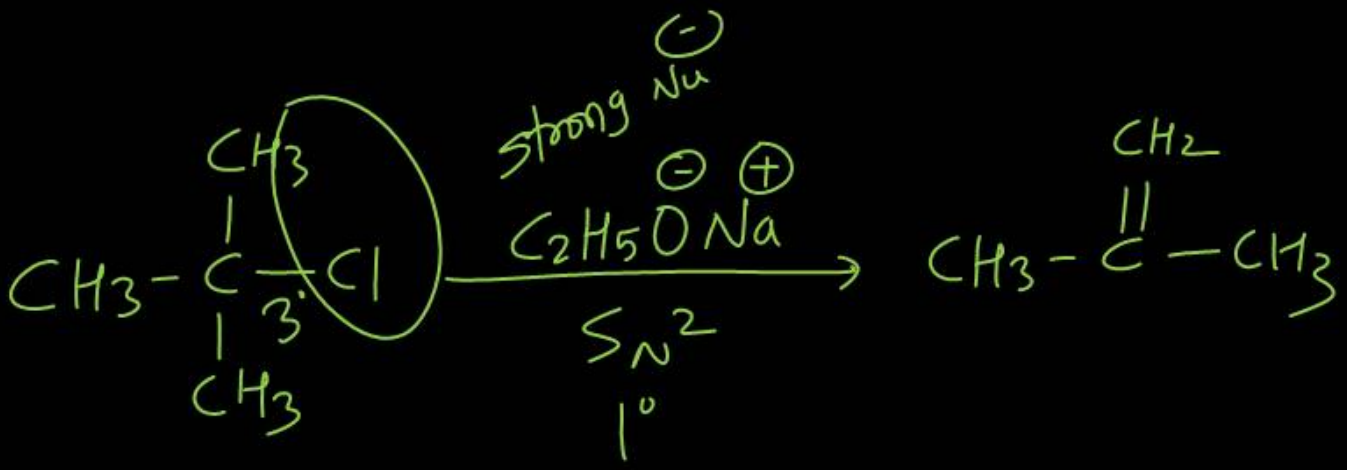
(1) 2–methylprop–1–ene

(2) 1–butene

(3) 2–butene

(4) ethene

1



Question no. 87

AAYAM CAREER INSTITUTE

The van't Hoff factor i for a compound which undergoes dissociation in one solvent and association in other solvent is respectively.

(1) less than one and greater than one.

(2) less than one and less than one.

(3) greater than one and less than one.

(4) greater than one and greater than one.

Dissociation $i^\circ > 1$

Association $i^\circ < 1$

Question no. 88

AAYAM CAREER INSTITUTE

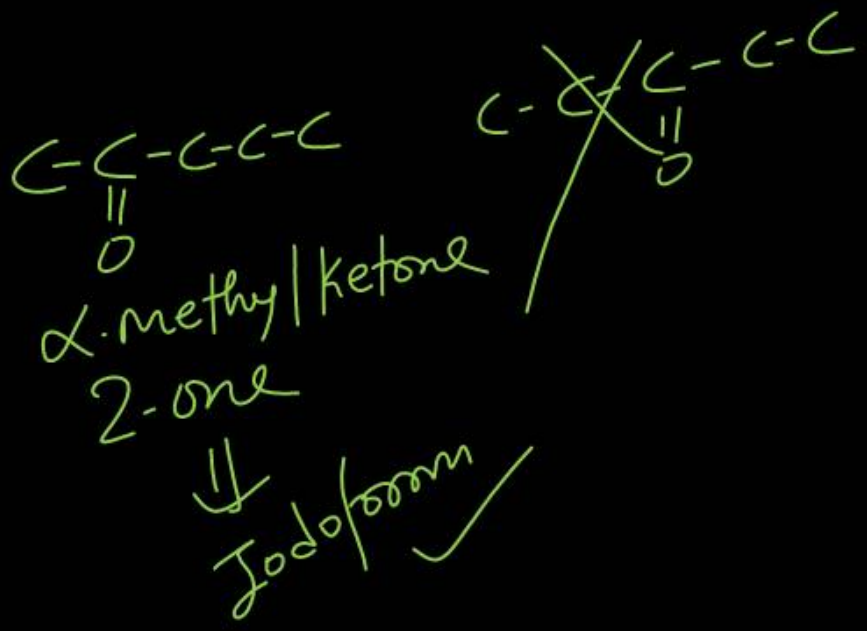
2–Pentanone and 3–pentanone can be distinguished by:

(1) Cannizzaro's reaction

(2) Aldol condensation

(3) Iodoform reaction

(4) Clemmensen's reduction



Question no. 89

A gaseous mixture of two substances A and B, under a total pressure of 0.8 atm is in equilibrium with an ideal liquid solution. The mole fraction of substance A is 0.5 in the vapour phase and 0.2 in the liquid phase. The vapour pressure of pure liquid A is ___ atm.

(1) 1.6 (2) 2.5

(3) 0.9 (4) 2

$P_T = P_S = 0.8$

$Y_A = 0.5, \quad X_A = 0.2$

$$Y_A = \frac{P_A^\circ X_A}{P_T}$$

$$0.5 = \frac{P_A^\circ \times 0.2}{0.8}$$

$$2 = P_A^\circ$$

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Question no. 90

AAYAM CAREER INSTITUTE

Match the List–I with List–II.

	List–I (cation)		List–II (group reagents)
(A)	Pb^{2+}	(i)	H_2S gas in presence of dilute HCl
(B)	Al^{3+}	(ii)	$(NH_4)_2CO_3$ in presence of NH_4OH
(C)	Co^{2+}	(iii)	NH_4OH in presence of NH_4Cl
(D)	Sr^{+2}	(iv)	H_2S in presence of NH_4OH

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

Choose the correct answer from options given below:

(1) A–(iii), B–(i), C–(iv), D–(ii)

(2) A–(i), B–(iii), C–(ii), D–(iv)

(3) A–(i), B–(iii), C–(iv), D–(ii)

(4) A–(iv), B–(ii), C–(iii), D–(i)

Question no. 91

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Gene with multiple phenotypic effect known as

(1) hypostatic genes (2) duplicate genes

(3) pleiotropic genes (4) complementary genes

3

Question no. 92

AAYAM CAREER INSTITUTE

From the statements given below choose the correct option.

A. Euchromatin is loosely packed chromatin

B. ~~Hetrochromatin is transcriptionally astive~~

C. Histone octomer is wrapped by negatively charged DNA in nucleosome

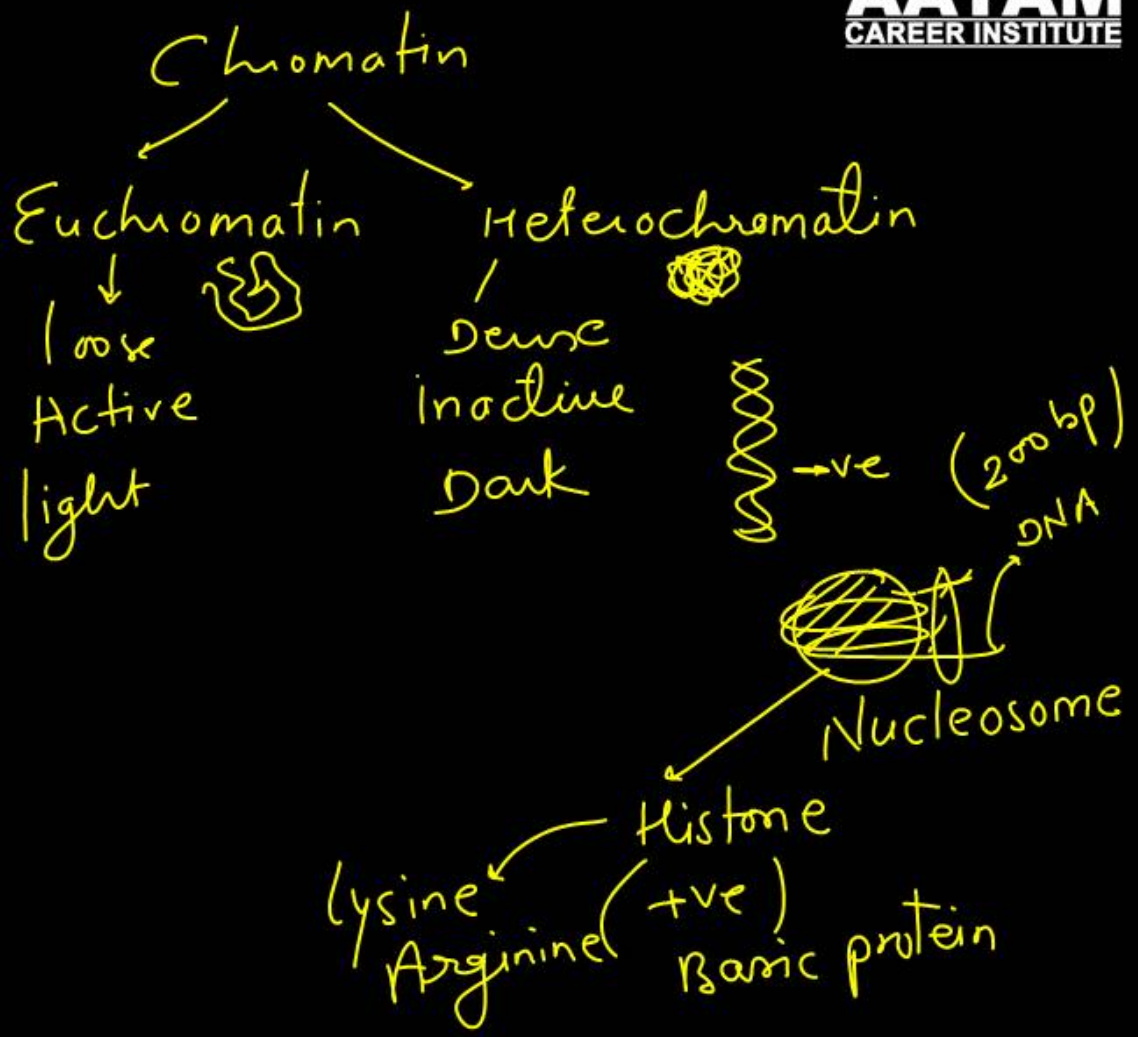
D. Histone are rich in lysine and arginine

E. ~~A typical nucleosome contains 400 bp of DNA helix~~

(1) A, C, D Only (2) B, E Only

(3) A, C, E Only (4) B, D, E Only

1



Question no. 93

AAYAM CAREER INSTITUTE

Which process is used for amplification or multiplication of DNA for finger printing ?

(1) polymerase chain reaction (PCR)

(2) nesslerisation

(3) southern blotting

(4) northern blotting

Question no. 94

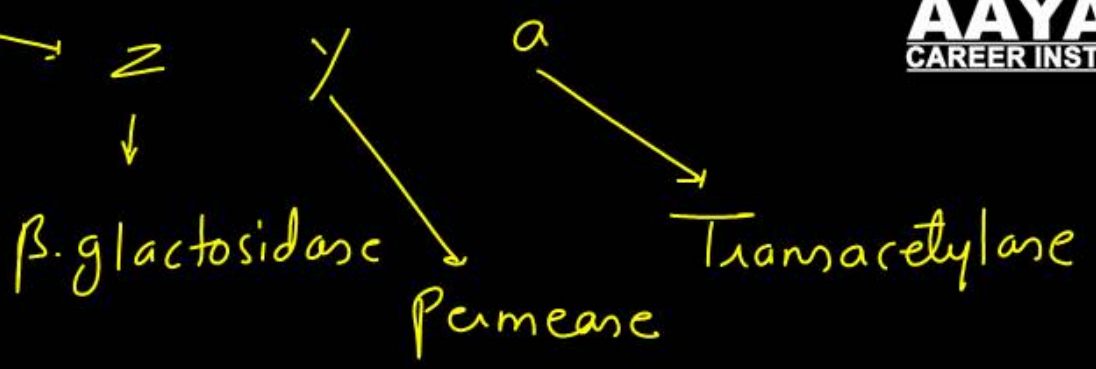
Lactose operon produces enzymes

(1) β - galactosidase, permease and ~~glycogen synthetase~~.

(2) β - galactosidase, permease and transacetylase

(3) permease, ~~glycogen synthetase~~ and transacetylase

(4) β - galactosidase, permease and ~~phosphoglucose isomerase~~



2

Question no. 95

GM. plants

AAYAM CAREER INSTITUTE

Transgenic plants are the ones.

(1) generated by introducing foregin DNA into a cell and regenerating a plant from the cell.

(2) produced after protoplast fusion in artificial medium

(3) grown in artificial medium after hybridization in the field.

(4) produced by a somatic embryo in artificial medium

Question no. 96

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Match List – I with List – II.

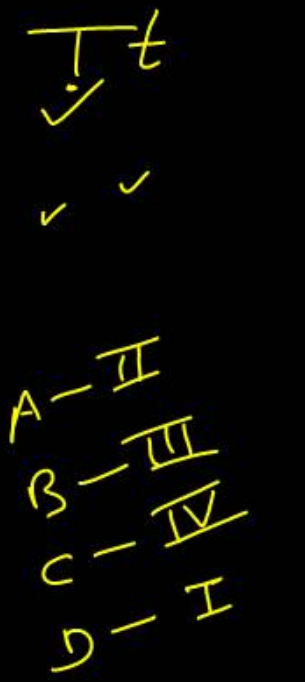
List – I		List – II	
A.	Dominance	I.	Many genes govern a single character
B.	Codominance	II.	In a heterozygous organism, only one allele expresses itself
C.	Multiple allele	III.	In a heterozygous organism, both alleles express themselves fully
D.	Polygenic inheritance	IV.	Alternative forms of same gene

(1) A – II; B – I, C – IV, D - III

(2) A – II, B – III, C – IV, D - I

(3) A – IV, B – I, C – II, D - III

(4) A – IV, B – III, C – I, D – II



Question no. 97

1990, 4 year old

ADA → lymphocyte

Gene for ADA

Adenosine deaminase deficiency can be permanently cured by which of the following methods ?

(1) ~~Bone marrow transplantation~~

(2) ~~Enzymes replacement therapy~~

(3) Gene therapy at early embryonic stages

(4) ~~By oral medications~~

3

Question no. 98

AAYAM CAREER INSTITUTE

Match List – I with List – II.

List – I		List – II	
A.	Homo habilis	I.	900 cc
B.	Neanderthal man	II.	1350 cc
C.	Homo erectus	III.	650 – 800 cc
D.	Homo sapiens	IV.	1400 cc

Choose the correct answer from options given below :

(1) A – III, B – I, C – IV, D - II

(2) A – III, B – II, C – I, D - IV

(3) A – III, B – IV, C – I, D - II

(4) A – IV, B – III, C – I, D - II

Question no. 99

AAYAM CAREER INSTITUTE

Given below are two statements :

Statement I : When a particular restriction enzyme cuts strand of DNA overhanging stretches or sticky ends are formed

Statement II : Some restriction enzyme cut the strand of DNA from the centre of palindromic sites

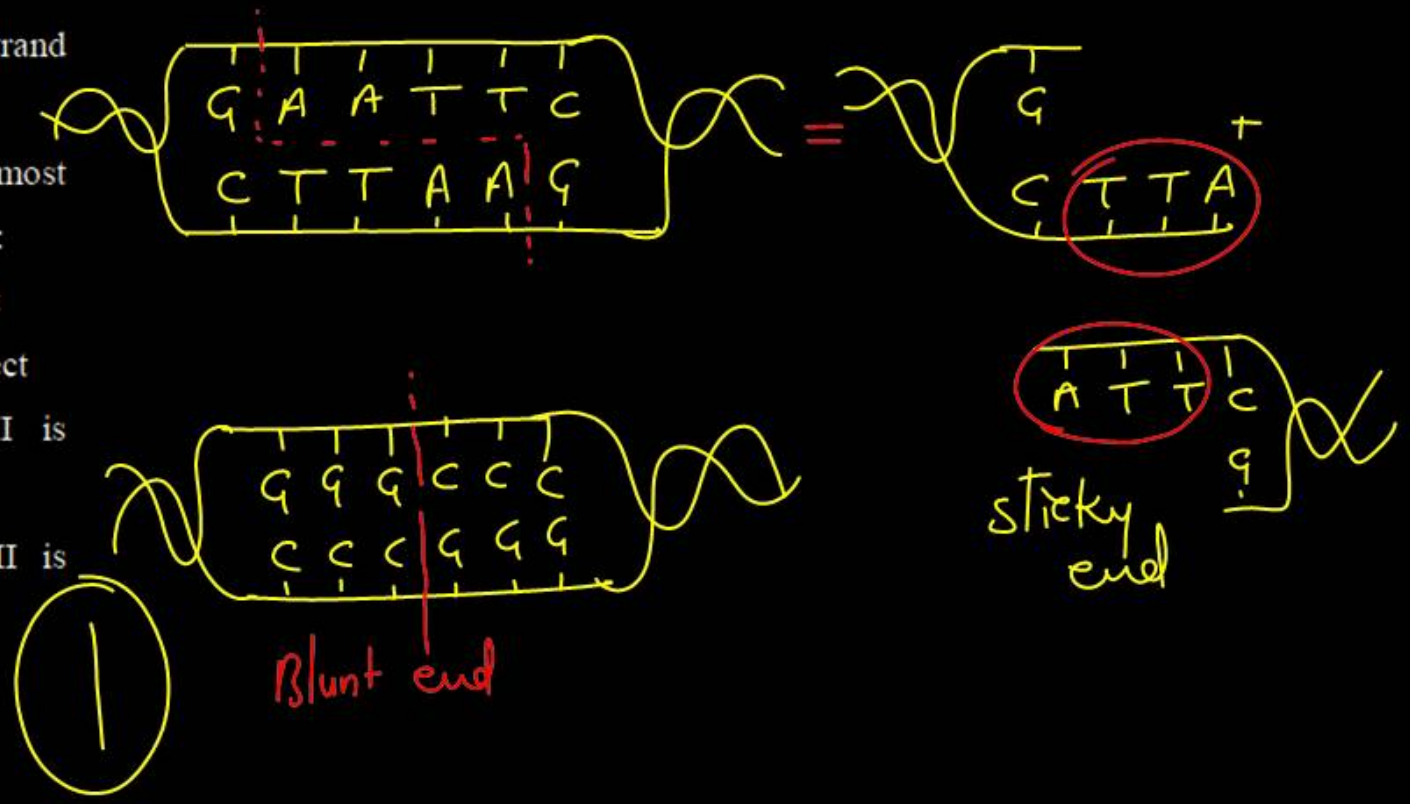
In the light of the above statements, choose the most appropriate answer from the options given below :

(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. 100

AAYAM CAREER INSTITUTE

Match List – I with List - II

List – I		List – II	
A.	Gene gun	I.	Replacement of a faulty gene by a normal healthy gene
B.	Gene therapy	II.	Used for transfer of Gene
C.	Gene cloning	III.	Total DNA in the cells of an organism
D.	Genome	IV.	To obtain identical copies of a particular DNA molecule

(Biolistic Gun)

A – II
B – I
C – IV
D – III

Choose the correct answer from options given below :

(1) A – II; B – III, C – IV, D - I

(2) A – II, B – I, C – IV, D - III

(3) A – I, B – III, C – II, D - IV

(4) A – IV, B – I, C – III, D – II

2

Question no. 101

AAYAM CAREER INSTITUTE

Which of the following steps are catalysed by Taq polymerase in a PCR reaction ?

(1) ~~Denaturation of template DNA~~

(2) ~~Annealing of primers to template DNA~~

(3) Extension of primer end on the template DNA

(4) Ligation of DNA

Denaturation
Annealing
Extension

Taq polymerase
↳ Thermus aquaticus

3

Question no. 102

AAYAM CAREER INSTITUTE

42°C

During heat shock of the bacterium, the temperature used for giving thermal shock is

(1) 82°C

(2) 100°C

(3) –196°C

(4) 42°C

4

Question no. 103

AAYAM CAREER INSTITUTE

In agarose gel electrophoresis, DNA molecules are separated on the basis of their

(1) charge only

(2) size only

(3) charge and size ratio

(4) viscosity

2

Question no. 104

AAYAM CAREER INSTITUTE

Mutations can be induced with

(1) infrared radiations (2) IAA

(3) ethylene (4) UV radiations

4

Question no. 105

AAYAM CAREER INSTITUTE

Given below are two statements

Statement I : Stop codons for mRNAs are UAA, UAG, UGA.

Statement II : tRNAs are not specific for each amino acid

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. 106

AAYAM CAREER INSTITUTE

The process by which protein synthesis from genetic code occurs is best described by

(1) Transcription (2) Translation

(3) Replication (4) Reproduction

Question no. 107

AAYAM CAREER INSTITUTE

What map unit (Centimorgan) is adopted in the construction of genetic maps ?

(1) A unit of distance between two expressed genes, representing 10% cross over

(2) A unit of distance between two expressed genes representing 100% cross over

(3) A unit of distance between genes on chromosomes, representing 1% cross over

(4) A unit of distance between genes on chromosomes, representing 50% cross over

cM

1 % freq. of recombination = 1 mu

3

Question no. 108

AAYAM CAREER INSTITUTE

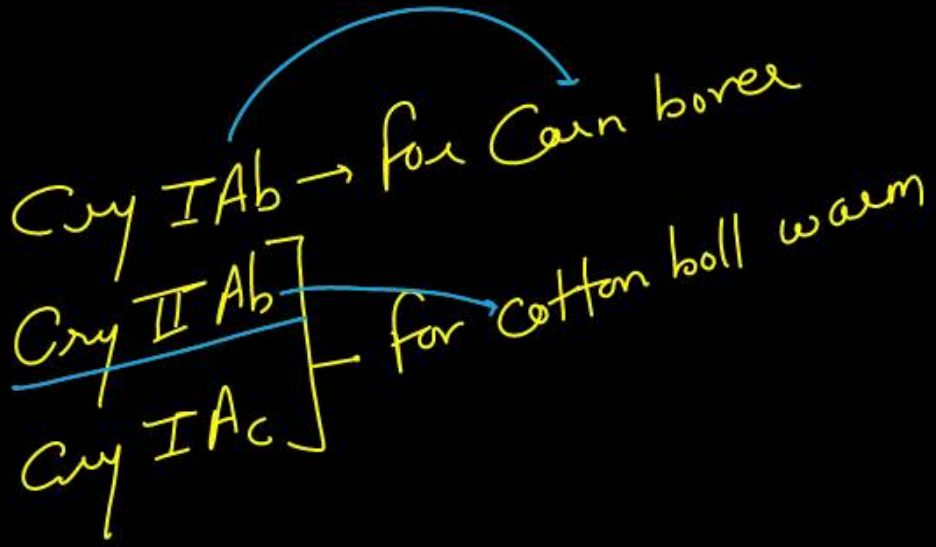
CryIIAb and cryIAb produce toxins that control

(1) cotton bollworms and corn borer respectively

(2) cotton borer and cotton bollworms respectively

(3) tobacco budworms and nematodes respectively

(4) nematodes and tobacco budworms respectively



Question no. 109

During insertional inactivation,the presence of a chromogenic substrate gives blue coloured colonies if the plasmid in the bacteria does not have an insert. The blue colour is produced by the enzyme

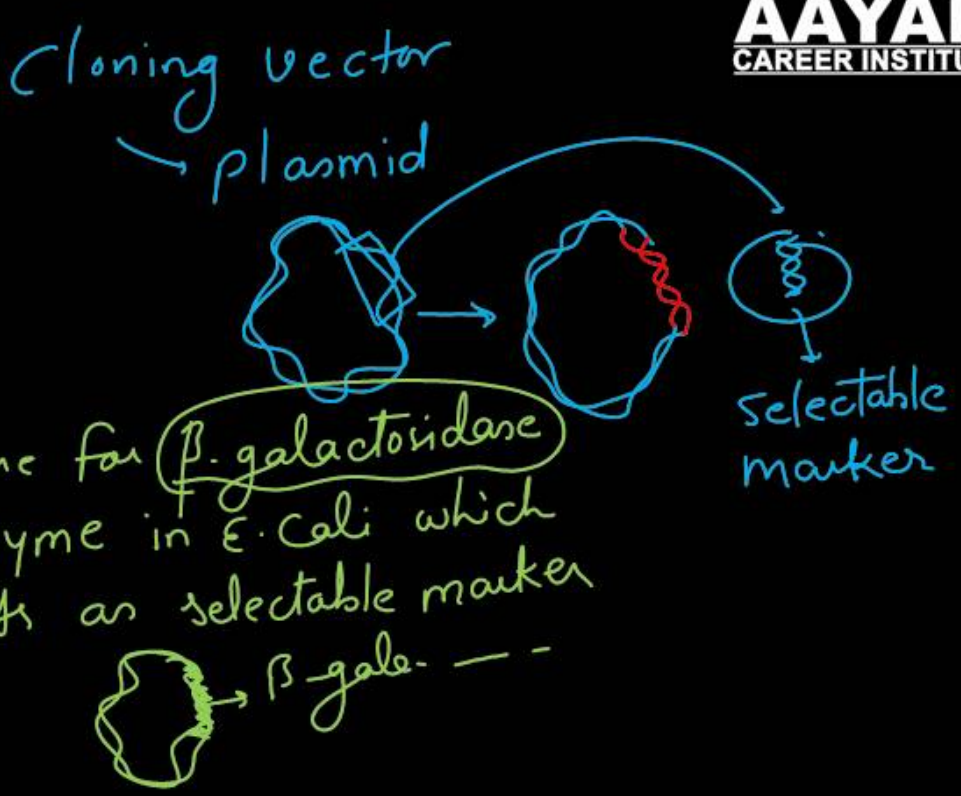
(1) ~~α - glucosidase~~

(2) ~~restriction endonuclease~~

(3) β- galactosidase

(4) Taq polymerase

3



Question no. 110

If the frequency of dominant allele is 60%, find out the percentage of heterozygous individuals in the population

(1) 48%
(2) 50%
(3) 47%
(4) 45%

$p = 60\% = 0.6$

$p + q = 1$

$0.6 + q = 1$

$q = 1 - 0.6 = 0.4$

$= 2pq$

$= 2 \times 0.6 \times 0.4$

$= 0.48$

$= 48\%$

AAYAM CAREER INSTITUTE

Question no. 111

AAYAM CAREER INSTITUTE

Lactose

In Escherichia coli, lac operon is induced by

(1) lactose

(2) promoter gene

(3) β - galactosidase

(4) I – gene

Question no. 112

Match List – I with List – II.

List – I		List – II	
A.	XX-XO method	I.	Turner's syndrome
B.	XX-XY method	II.	Female heterogametic
C.	Karyotype-45	III.	Grasshopper
D.	ZW-ZZ method	IV.	Female homogametic

Choose the correct answer from options given below :

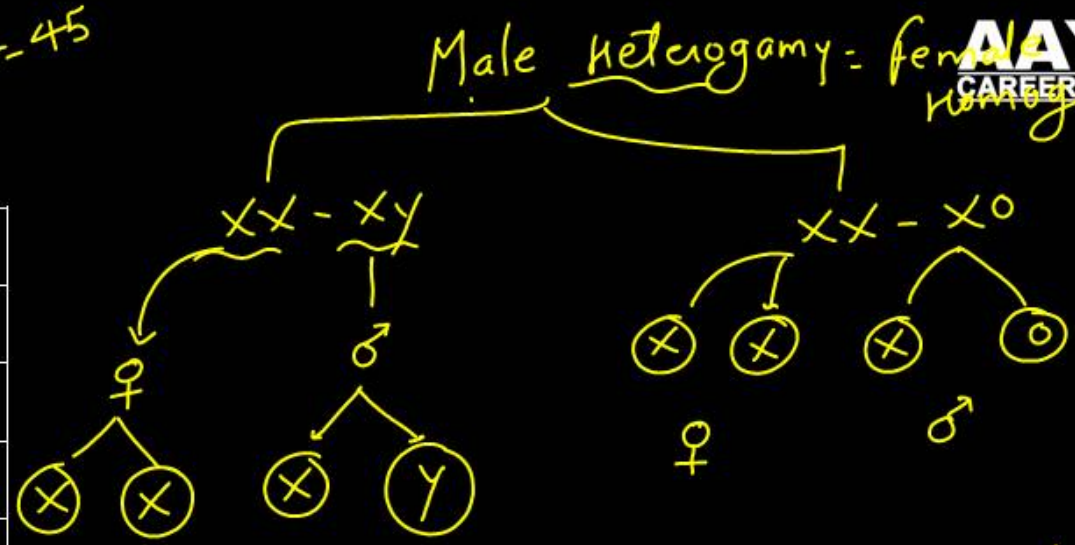
(1) A – IV,B – II, C – I, D - III

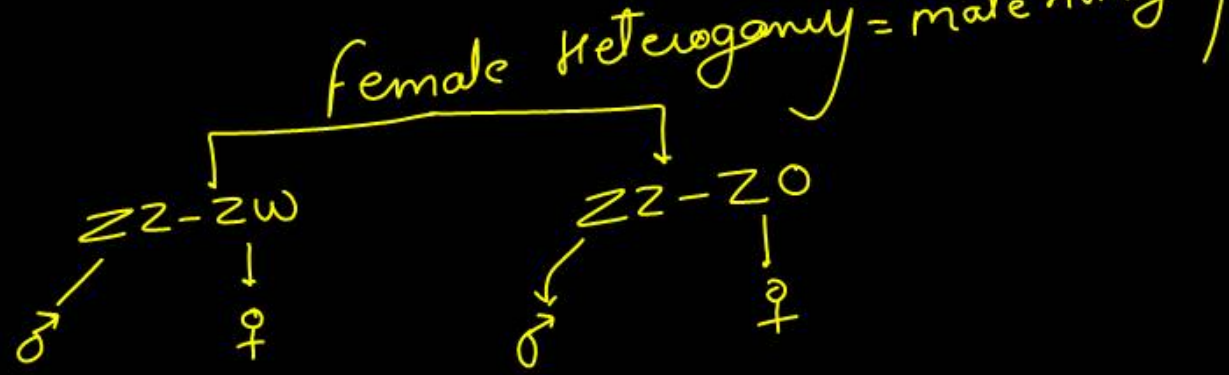
(2) A – II, B – IV, C – I, D - III

(3) A – I, B – IV, C – II, D - III

(4) A – III, B – IV, C – I, D - II

♀ = 44 + XO = 45





4

Question no. 113

AAYAM CAREER INSTITUTE

If Adenine makes 30% of the DNA molecule, what will be the percentage of Thymine, Guanine and Cytosine in it ?

(1) T:20: ; G : 25 ; C : 25

(2) T:20: ; G : 30 ; C : 20

(3) T:20: ; G : 20 ; C : 30

(4) T:30: ; G : 20 ; C : 20

4

A = T

G = C

Purine = pyrimidine

A + G = C + T

50% = 50%

A = 30% T = 30%

G = 20% C = 20%

Question no. 114

AAYAM CAREER INSTITUTE

If a genetic disease is transferred from a phenotypically normal but carrier female to only some of the male progeny, the disease is

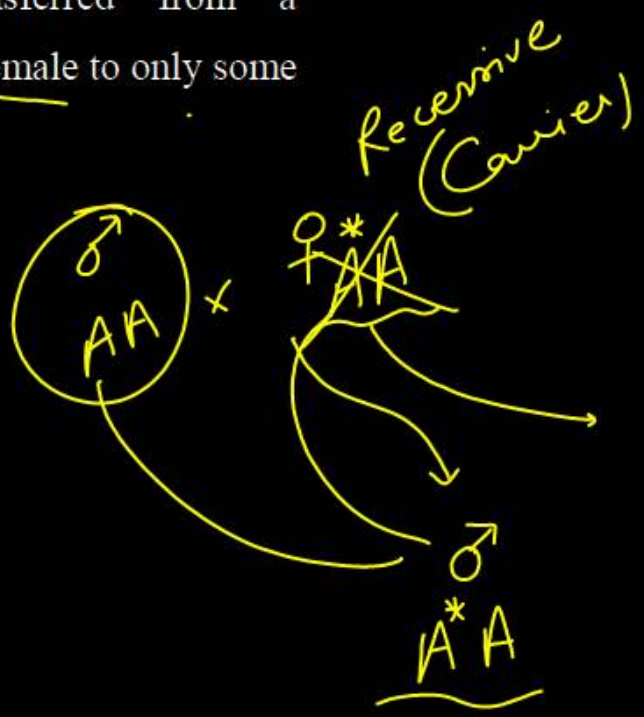
(1) autosomal dominant

(2) autosomal recessive

(3) sex – linked dominant

(4) sex – linked recessive

4



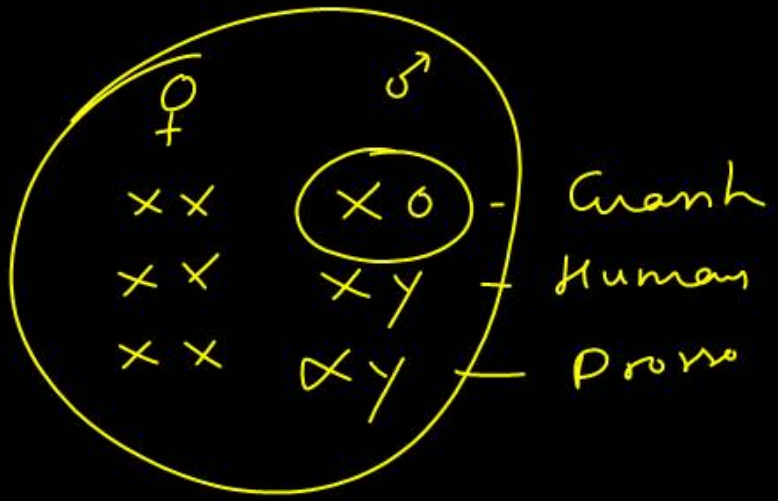
Sex determination in grasshoppers, humans, and Drosophila is similar because

(1) females are hemizygous

(2) males have one X-chromosome and females have two X-chromosomes

(3) all males always have one Y – chromosome in all three species

(4) the ratio of autosomes to sex chromosomes is the same in all three organisms



2

Question no. 116

AAYAM CAREER INSTITUTE

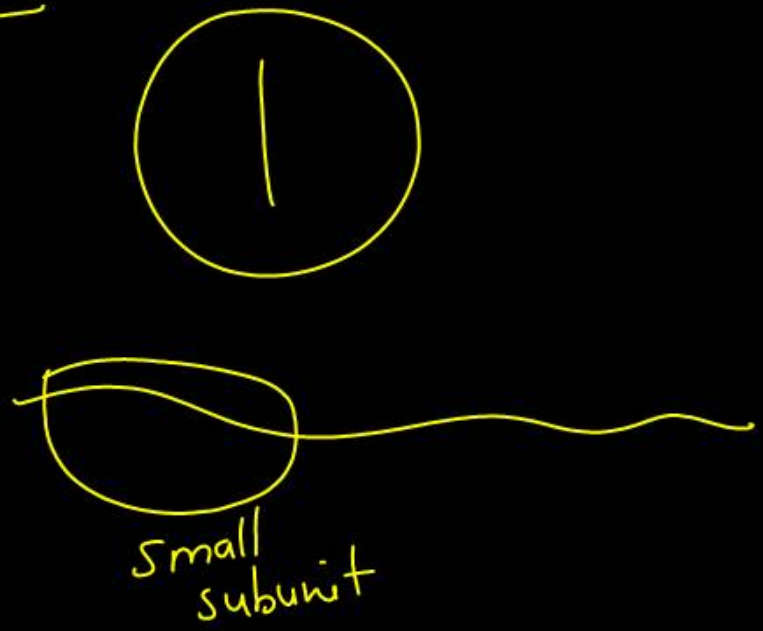
To initiate translation, the mRNA first binds to

(1) the smaller ribosomal sub - unit

(2) the larger ribosomal sub - unit

(3) the whole ribosome

(4) no such specificity exists



Question no. 117

AAYAM CAREER INSTITUTE

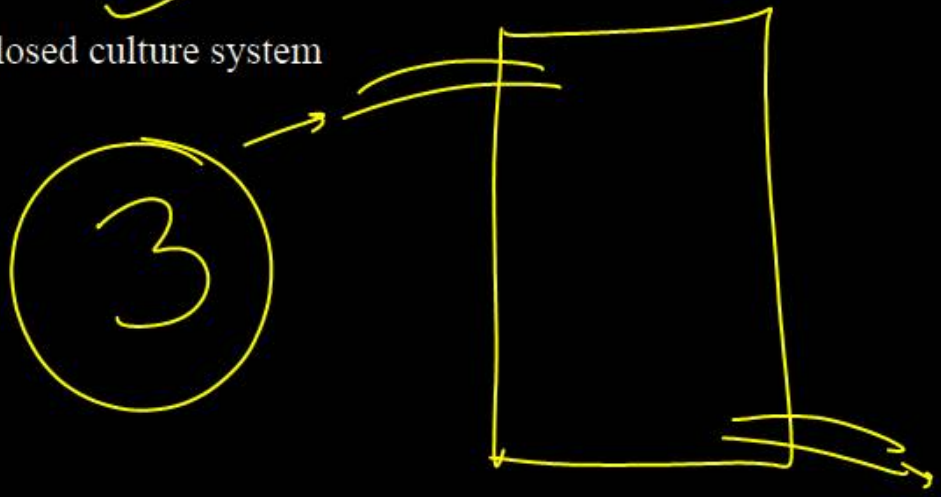
Which of the following should be chosen for best yield if one were to produce a recombinant protein in large amounts?

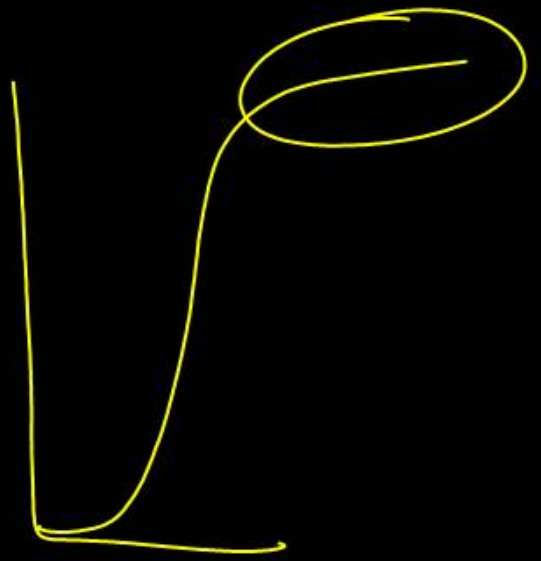
(1) Laboratory flask of largest capacity

(2) A stirred tank bioreactor without inlets

(3) A continuous culture system

(4) Closed culture system





Question no. 118

Match List – I with List – II

List – I		List – II	
A.	Genetic Drift	I.	Change in allele frequency due to immigration and emigration
B.	Stabilising selection	II.	Change in gene frequency due to chance factor
C.	Gene flow	III.	More individuals acquire mean character value
D.	Saltation	IV.	Single step large mutation

Choose the correct answer from options given below :

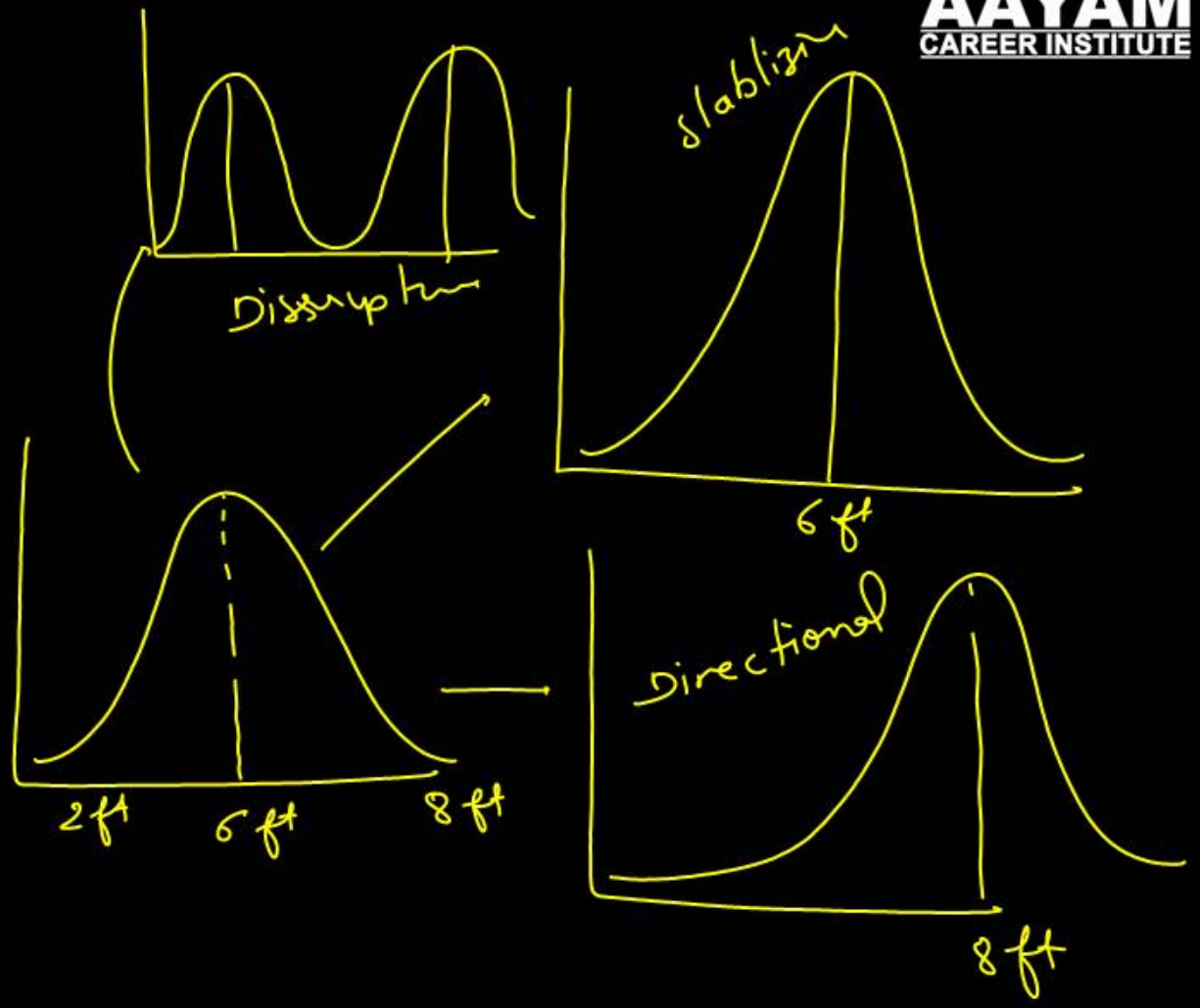
(1) A – I, B – II, C – III, D - IV

(2) A – III, B – I, C – II, D - IV

(3) A – I, B – III, C – IV, D - II

(4) A – II, B – III, C – I, D – IV

4



Question no. 119

Given below are two statements :

Statement I : Darwin's finches of Galapagos islands have different types of modified beaks according to their food habits.

Statement II : Adaptive radiation, leads to development of different functional structures from a common ancestral form.

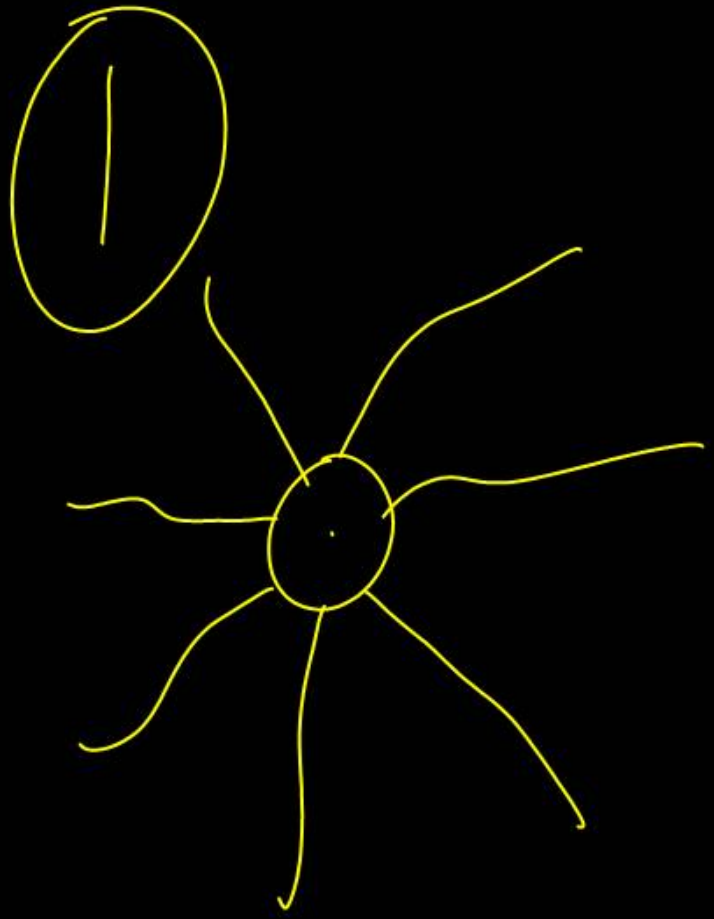
In the light of the above statements, choose the most appropriate answer from the options given below :

(1) Both statement I and statement II are correct

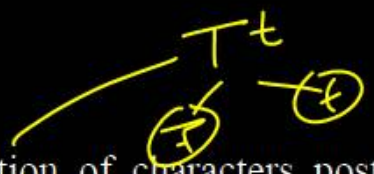
(2) Both statement I and statement II are incorrect

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

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



Question no. 120



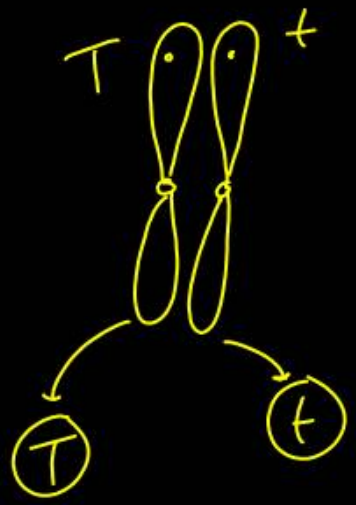
The law of segregation of characters postulated by Mendel can be related to

(1) the presence of two genes for each character in a somatic cell

(2) a gamete receiving only one of the two homologous chromosomes during gamete formation

(3) presence of both genes on the same chromosome

(4) parents contain three alleles during gamete formation



2

Question no. 121

AAYAM CAREER INSTITUTE

Histone proteins are

(1) basic, negatively charged

(2) basic, positively charged

(3) acidic, positively charged

(4) acidic, negatively charged

2

Question no. 122

AAYAM CAREER INSTITUTE

Given below are two statements :

Statement I : A piece of DNA inserted into an alien organism generally does not replicate if not inserted into a chromosome

Statement II : Chromosomes have specific sequences called 'ori' region where DNA replication is initiated

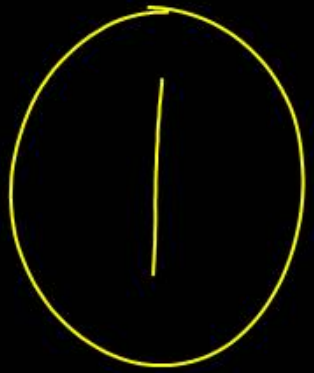
If the light of the above statements, choose the most appropriate answer from the options given below :

(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. 123

AAYAM CAREER INSTITUTE

Who among the following was the first to develop a recombinant DNA using plasmid ?

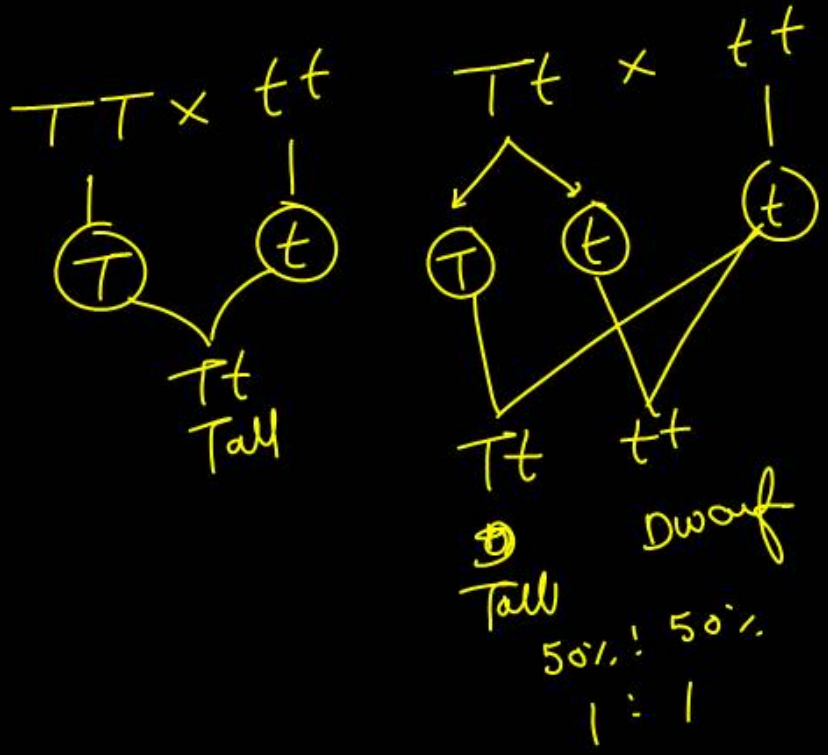
(1) Boyer & Cohen
(2) Ochoa
(3) Kary Mullis
(4) Arthur Kornberg

Question no. 124

Which of the following crosses will give tall and dwarf pea plants in same proportions ?

(1) TT × tt
(2) Tt × tt
(3) TT × Tt
(4) tt × tt

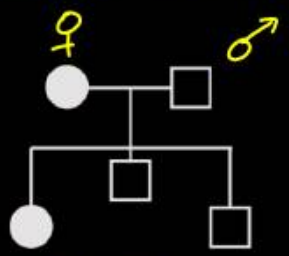
2



Question no. 125

AAYAM CAREER INSTITUTE

Given pedigree shows that the trait is inherited as autosomal dominant. Trace the genotype of mother and father



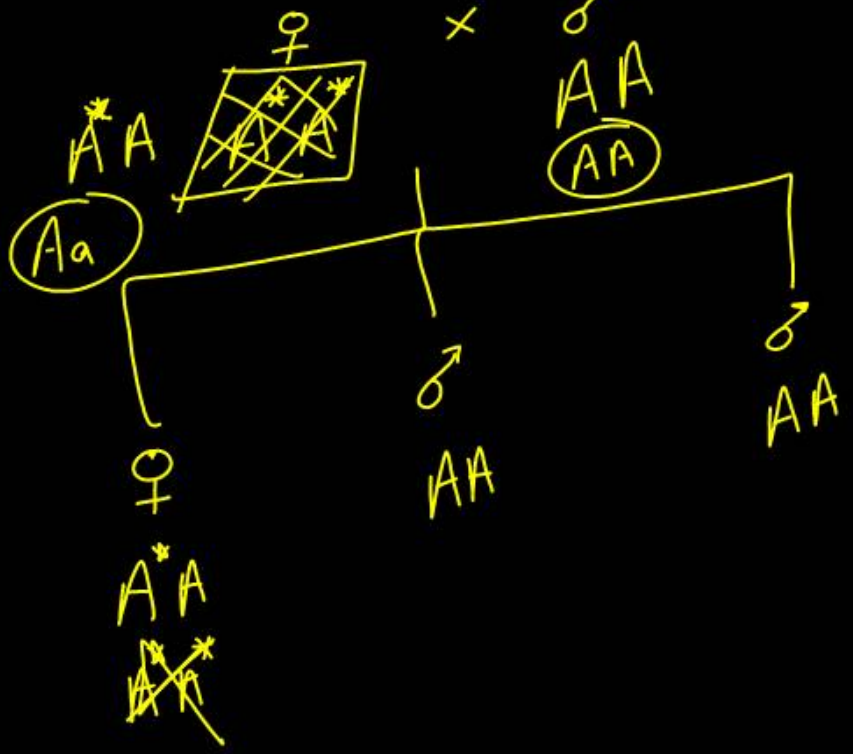
(1) Father AA, Mother aa

(2) Father AA, Mother Aa

(3) Father aa, Mother AA

(4) Father aa, Mother Aa

2



Question no. 126

AAYAM CAREER INSTITUTE

The term 'molecular scissors' refers to

(1) recombinant DNA

(2) restriction enzymes

(3) Taq polymerase

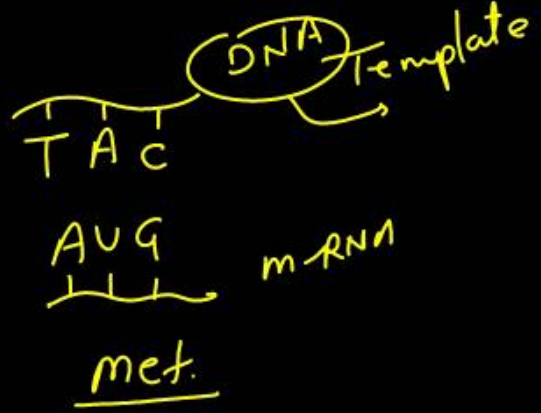
(4) palindromic nucleotide sequences

Question no. 127

AAYAM CAREER INSTITUTE

What sequence on the template strand of DNA corresponds to the first amino acid inserted into a protein ?

(1) TAC
(2) UAC
(3) UAG
(4) AUG



Question no. 128

AAYAM CAREER INSTITUTE

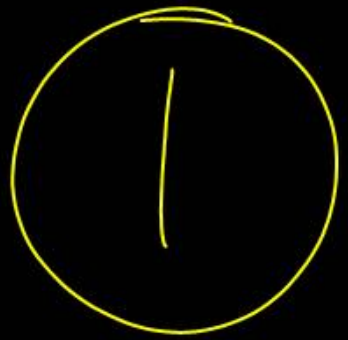
Expressed Sequence Tags (ESTs) refers to :

(1) Genes expressed as RNA

(2) Polypeptide expression

(3) DNA polymorphism

(4) Novel DNA sequences



Question no. 129

AAYAM CAREER INSTITUTE

Experimental material used by Hershey and Chase for proving that DNA controls heredity was

(1) Diplococcus pneumoniae

(2) Salmonella typhimurium

(3) Bacteriophage

(4) TMV

1952 — T_2 Bacteriophage

E. coli

S^{35}

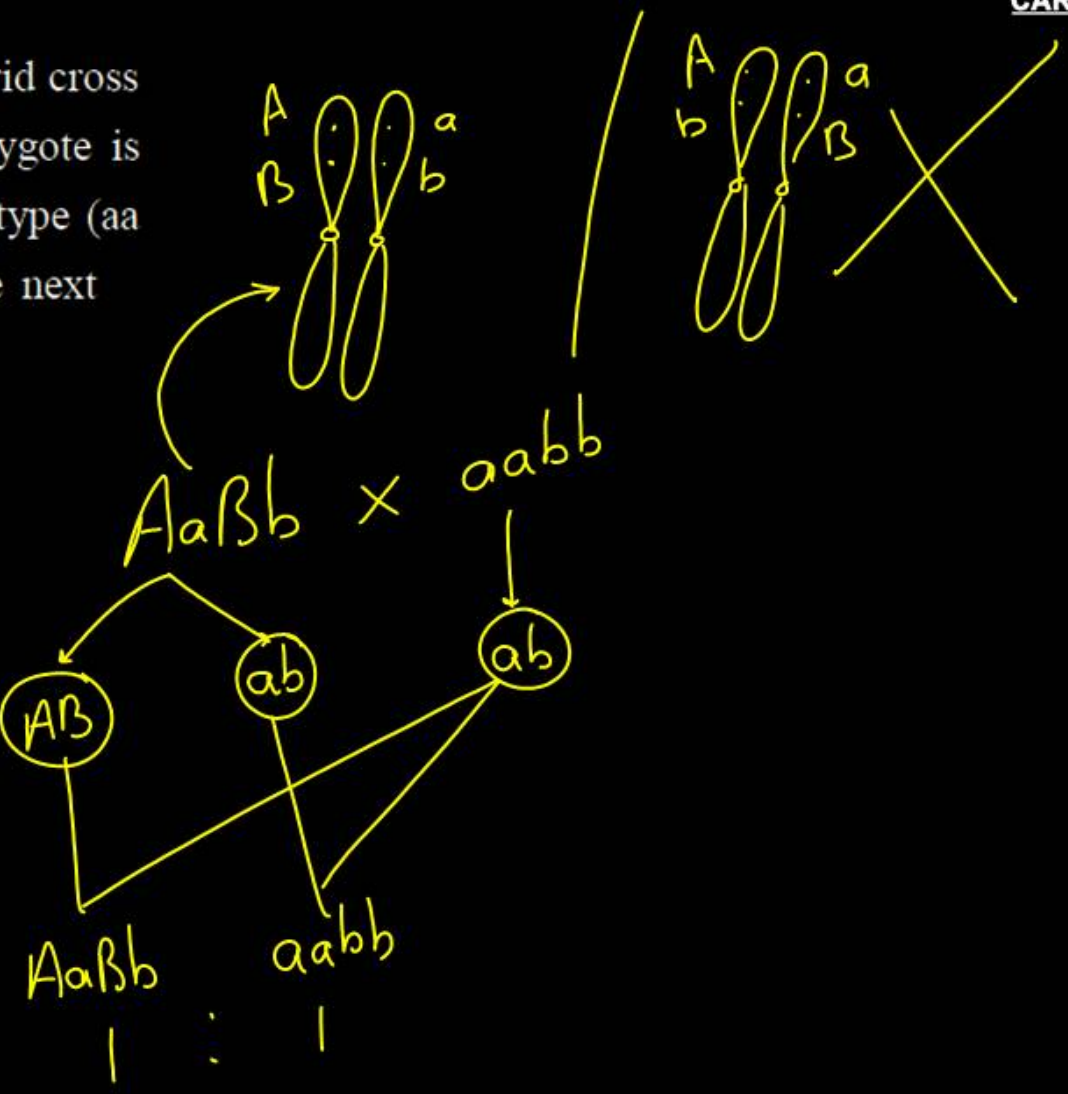
P^{32}

Two genes 'A' and 'B' are linked. In a dihybrid cross involving these two genes, the F_1, - heterozygote is crossed with homozygous recessive parental type (aa bb). what would be the ratio of offspring in the next generation ?

(1) 1 : 1 : 1 : 1 (2) 9 : 3 : 3 : 1

(3) 3 : 1 (4) 1 : 1

4



Question no. 131

AAYAM CAREER INSTITUTE

Identify the correct statements and select the correct option.

A. ~~Life originated in Mesozoic era~~

B. Earth was formed about 4.5 billion years ago

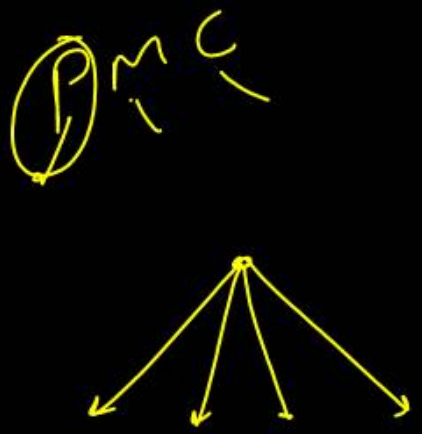
C. Lobefins evolved into first amphibians

D. Homologous organs show divergent evolution

E. First form of life could have come from pre – existing non-living organic molecule.

(1) B, C, D and E only (2) B, C and E only

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



Question no. 132

AAYAM CAREER INSTITUTE

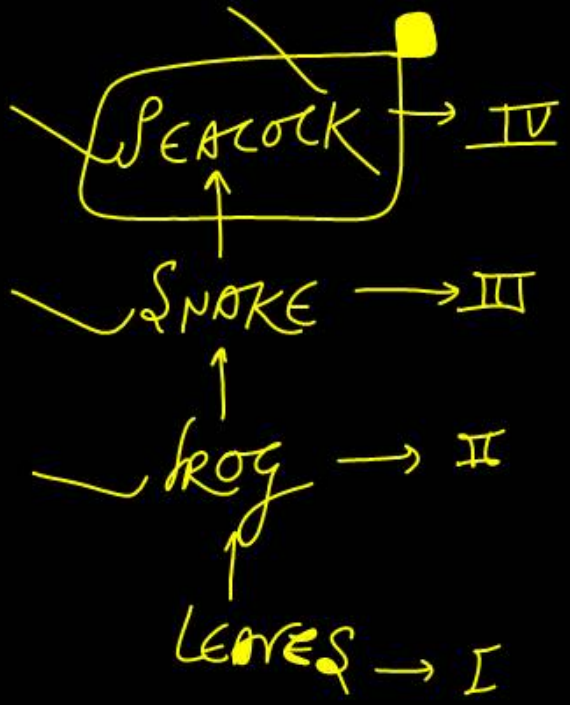
A peacock eats snakes which eat frogs. Frogs which in turn thrive on leaves of the plants. The peacock is

(1) primary consumer

(2) secondary consumer

(3) decomposer

(4) apex of the food pyramid



Question no. 133

AAYAM CAREER INSTITUTE

Endemic plants and animals are those which are

(1) cosmopolitan in distribution

(2) restricted to certain area

(3) found in arctic region

(4) gregarious in habit

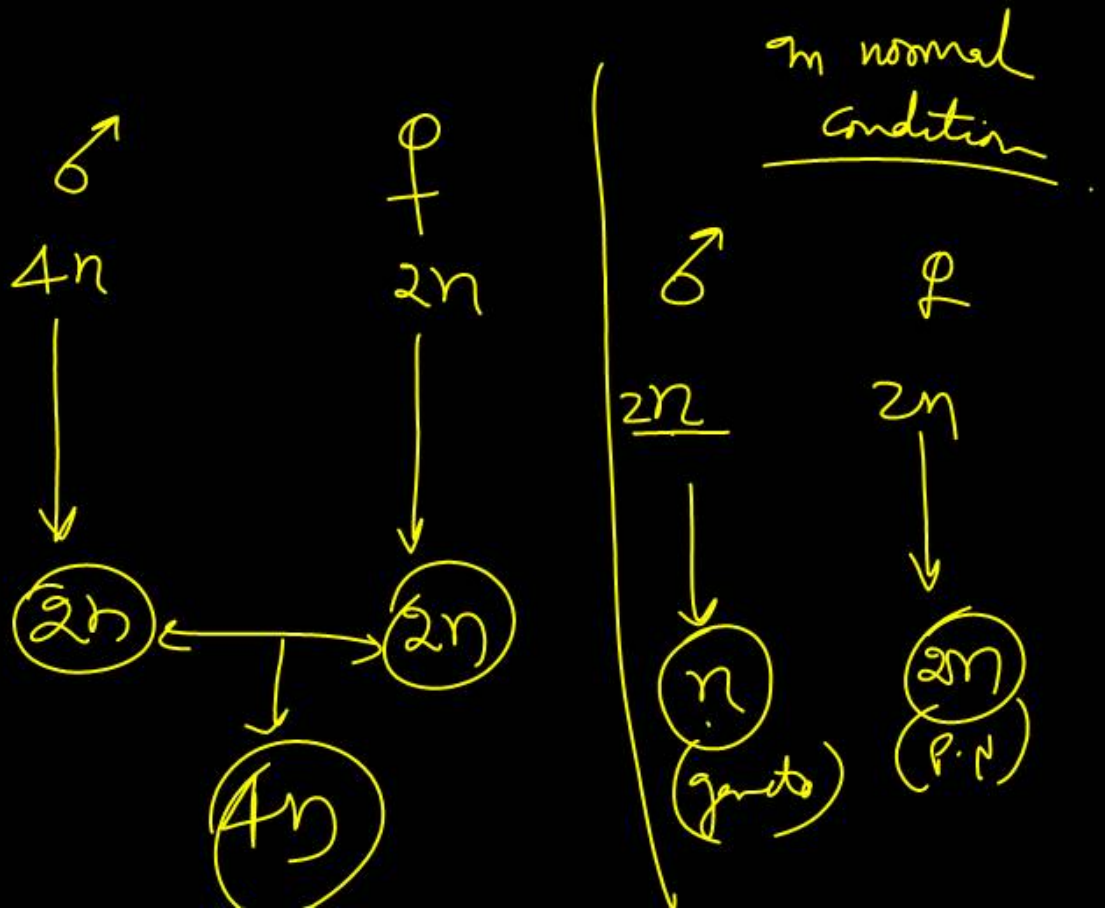
Question no. 134

AAYAM CAREER INSTITUTE

If a diploid female plant and a tetraploid male plant are crossed, the ploidy of endosperm shall be

(1) tetraploid (4n) (2) triploid

(3) diploid (4) pentaploid



Question no. 135

AAYAM CAREER INSTITUTE

Connell's elegant field experiments are related to barnacle, in which superior barnacle Balanus dominates the inter tidal area and excludes the smaller barnacle Chathamalus from that zone. This phenomenon is called

(1) competitive exclusion principle (Gause)

(2) competitive release

(3) interspecific competition

(4) Amensalism

Question no. 136

AAYAM CAREER INSTITUTE

Which one of the following pairs of geographical areas show maximum biodiversity in our country ?

(1) Sunderbans and Rann of Kutch

(2) Eastern Ghats and West Bengal

(3) Eastern Himalaya and Western Ghats

(4) Kerala and Punjab

HOT-SPOTS

Question no. 137

AAYAM CAREER INSTITUTE

Which one of the following pairs of organisms are exotic species introduced in India ?

(1) Nile perch, Ficus religiosa

(2) Ficus religiosa,Lantana camara

(3) Lantana camara, Water hyacinth

(4) Water hyacinth, Prosopis cinereria

Question no. 138

AAYAM CAREER INSTITUTE

The Cichlid species of Lake Victoria were driven to, or nearly to extinction by the introduction of_____

(1) North American sturgeon

(2) Nile perch

(3) Eels

(4) Bass

ALIEN SPECIES INVASION.

Question no. 139

AAYAM CAREER INSTITUTE

The coconut water from tender coconut is

(1) cellular endosperm

(2) free nuclear endosperm

(3) both cellular and nuclear endosperm

(4) free nuclear embryo

Question no. 140

AAYAM CAREER INSTITUTE

The narrowly utilitarian arguments for biodiversity conservation include which of the following from the given list ?

A. Industrial products like dyes, lubricants

B. Ecosystem services like photosynthesis

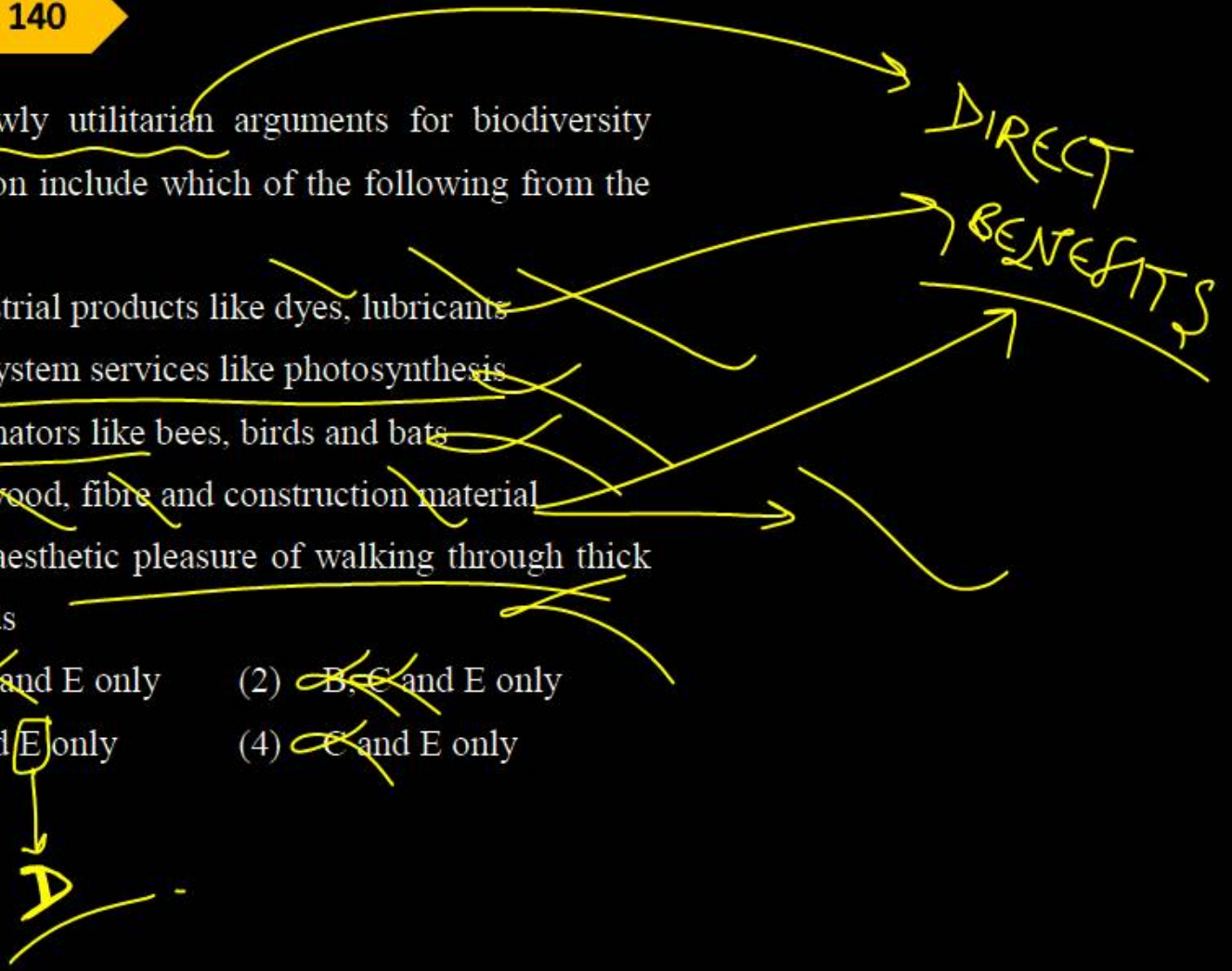
C. Pollinators like bees, birds and bats

D. Firewood, fibre and construction material

E. The aesthetic pleasure of walking through thick woods

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

(3) A and E only (4) C and E only



Question no. 141

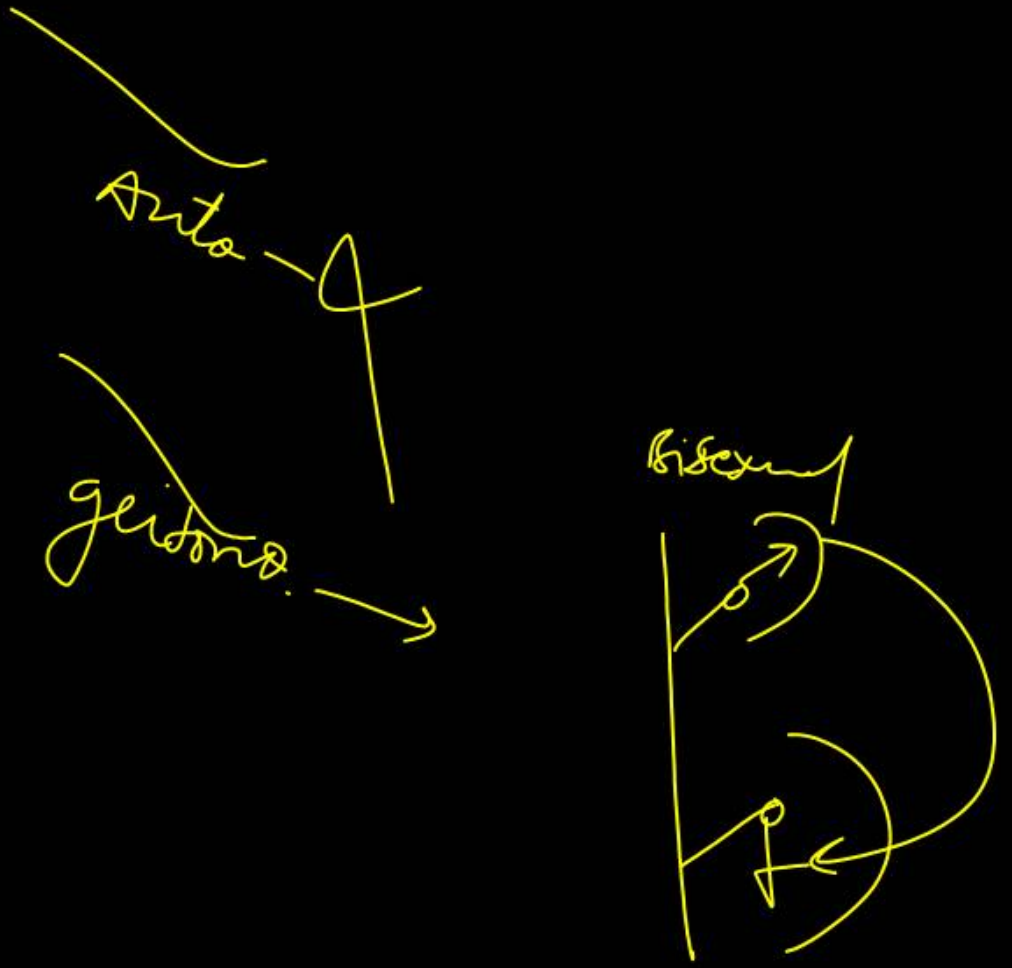
Unisexuality of flowers prevents

(1) geitonogamy but not xenogamy

(2) autogamy and geitonogamy

(3) autogamy but not geitonogamy

(4) both geitonogamy and xenogamy



Question no. 142

AAYAM CAREER INSTITUTE

Which one is the most important human activity leading to extinction of wildlife?

(1) Alteration and destruction of the natural habitats → HABITAT LOSS & FRAGMENTATION

(2) Hunting for commercially valuable wildlife products

(3) Pollution of air and water

(4) Introduction of alien species

Question no. 143

AAYAM CAREER INSTITUTE

The formula for logistic growth is

(1) $\frac{dN}{dt} = rN$

(2) $\frac{rN}{dN} = dt$

(3) $\frac{dN}{dt} = rN\left[\frac{K-N}{K}\right]$

(4) $\frac{dN}{dt} = rN\left[\frac{N-K}{N}\right]$

Question no. 144

AAYAM CAREER INSTITUTE

Which of the following is not the approach for in-situ conservation ?

(1) Biosphere reserve

(2) Sanctuary

(3) Wildlife safari park

(4) Sacred grove

Question no. 145

AAYAM CAREER INSTITUTE

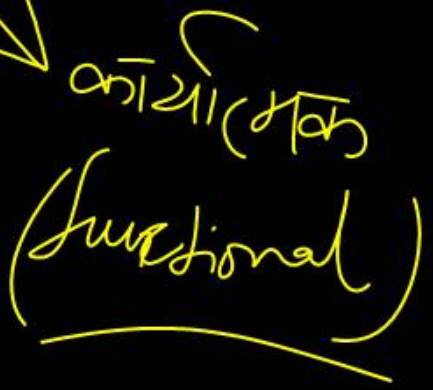
Two main structural features of an ecosystem are

(1) species composition and stratification

(2) species composition and productivity

(3) productivity and energy flow

(4) nutrient cycling and stratification



Question no. 146

AAYAM CAREER INSTITUTE

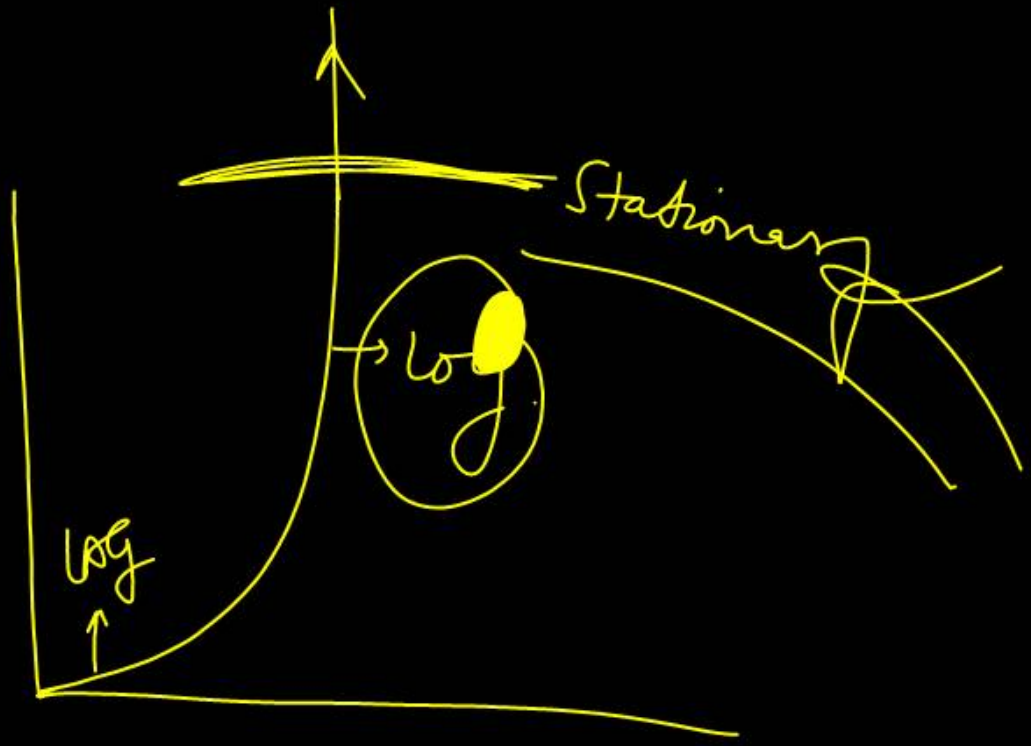
In 'J' shaped growth curve of population

(1) exponential phase is lacking

(2) exponential and stationary phases are absent

(3) lag phase is lacking

(4) stationary phase is absent



Question no. 147

AAYAM CAREER INSTITUTE

_____ in birds is an interesting example of parasitism in which the parasitic bird lays its eggs in the nest of its host and the host incubates them

(1) Bird parasitism
(2) Breed parasitism
(3) Brood parasitism
(4) Ectoparasites

Question no. 148

AAYAM CAREER INSTITUTE

In a fertilised embryo sac, the haploid , diploid and triploid structure are :

(1) synergid, zygote and primary endosperm nucleus

(2) synergid, antipodal and polar nuclei

(3) antipodal, synergid and primary endosperm nucleus

(4) synergid, polar nuclei and zygote

Question no. 149

AAYAM CAREER INSTITUTE

Variation shown by the medicinal plant Rauwolfia growing in different Himalayan ranges comes under

(1) Species diversity (2) Ecological diversity

(3) Genetic diversity (4) Population diversity

Question no. 150

AAYAM CAREER INSTITUTE

The correct order of the process of decomposition is

(1) Catabolism → Fragmentation → Leaching → Humification → Mineralisation

(2) Catabolism → Fragmentation → Humification → Leaching → Mineralisation

(3) Fragmentation → Humification → Catabolism → Leaching → Mineralisation

(4) Fragmentation → Leaching → Catabolism → Humification → Mineralisation

F
L
C
H
M

Question no. 151

AAYAM CAREER INSTITUTE

Albuminous seeds store their reserve food mainly in

(1) perisperm

(2) endosperm

(3) cotyledons

(4) hypocotyl

ENDOSPERMIC SEEDS

Question no. 152

AAYAM CAREER INSTITUTE

Match List – I with List - II

List - I (Bacterium)		List - II (Product)	
A.	Aspergillus niger	I.	Lactic acid
B.	Acetobacter aceti	II.	Butyric acid
C.	Clostridium butylicum	III.	Acetic acid
D.	Lactobacillus	IV.	Citric acid

(1) A – II, B – III, C – IV, D - I

(2) A – II, B – IV, C – III, D - I

(3) A – IV, B – III, C – II, D - I

(4) A – IV, B – I, C – III, D - II

3

Question no. 153

AAYAM CAREER INSTITUTE

IUDs are small objects made up of plastic or copper that are inserted in the uterine cavity
Which of the following statements are correct about IUDs ?

A. IUDs decrease phagocytosis of sperm within the uterus
B. The released copper ions suppress the sperm motility.
C. IUDs make the cervix hostile to the sperm
D. IUDs suppress the fertilization capacity of sperm
E. The IUDs require surgical intervention for their insertion in the uterine cavity

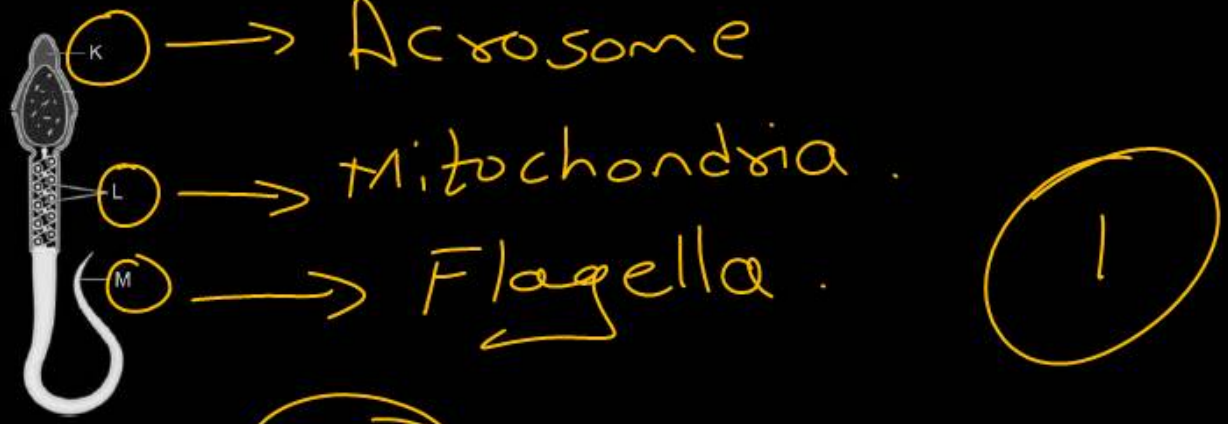
Choose the correct answer from options given below.

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

Question no. 154

AAYAM CAREER INSTITUTE

Observe the given diagram with parts labelled as K, L and M.



Which part of the given diagram is not essential for sperm motility ?

(1) K

(2) L

(3) M

(4) Both M and L

Question no. 155

AAYAM CAREER INSTITUTE

Level of which hormones are at their highest during the luteal phase (second half of the cycle) of the menstrual cycle ?

(1) Estrogen

(2) Progesterone

(3) Luteinizing hormone

(4) Follicular stimulating hormone

2

After 14th Day

Question no. 156

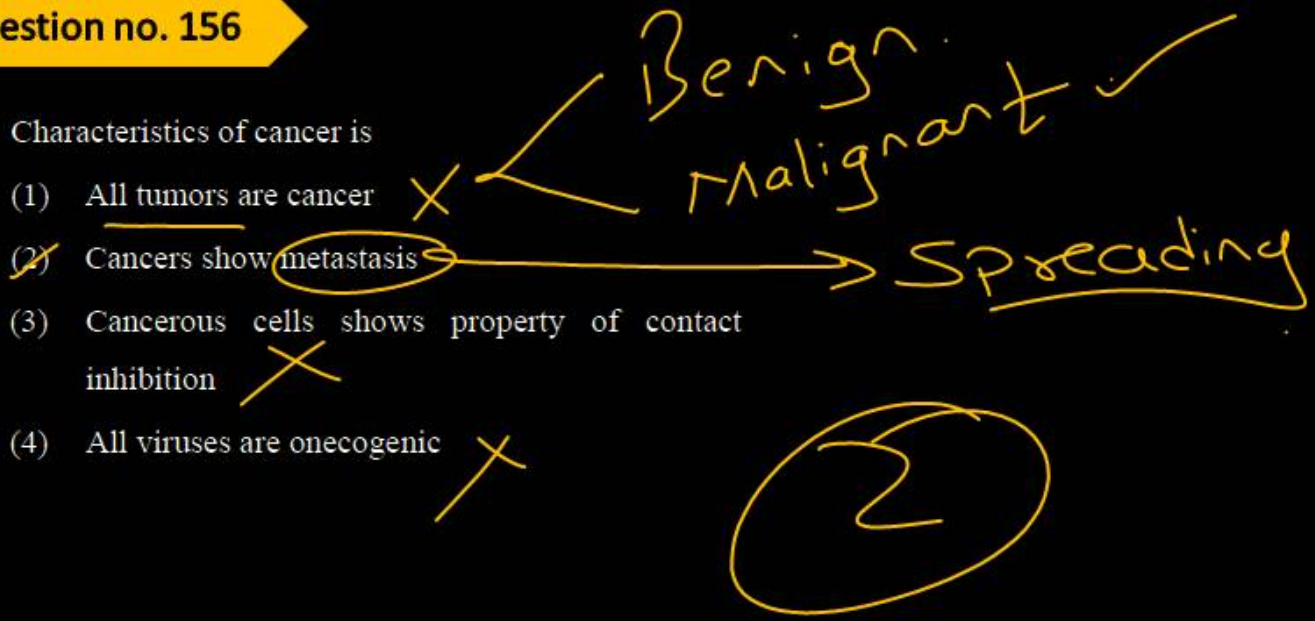
Characteristics of cancer is

(1) All tumors are cancer

(2) Cancers show metastasis

(3) Cancerous cells shows property of contact inhibition

(4) All viruses are onecogenic



Question no. 157

AAYAM CAREER INSTITUTE

How would periodic abstinence prevent conceiving in women ?

(1) mating during 10-17 days only

(2) avoiding coitus during 1-7 days of menstrual cycle

(3) by avoiding coitus in between 10-17 days of menstrual cycle

(4) avoiding coitus during luteal phase

3

Question no. 158

AAYAM CAREER INSTITUTE

Given below are two statements :

Statement I : Disease or infections which are transmitted through sexual intercourse are collectively called sexually transmitted infections.

Statement II : STD's if not properly treated may lead to pelvic inflammatory diseases, abortion, still birth, Ectopic pregnancies, infertility or even cancer of reproductive tract.

Choose the correct answer from 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. 159

AAYAM CAREER INSTITUTE

Match List – I with List – II.

List – I		List – II	
A.	Cellular barrier	I.	Interferons
B.	Cytokine barrier	II.	Mucus
C.	Physical barrier	III.	Monocyte
D.	Physiological	IV.	Saliva

Choose the correct answer from options given below :

(1) A – III; B – I, C – II, D - IV

(2) A – II, B – III, C – IV, D - I

(3) A – II, B – III, C – I, D - IV

(4) A – III, B – IV, C – II, D – I

Question no. 160

AAYAM CAREER INSTITUTE

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

Assertion (A) : Besides curdling of milk, LAB also improve its nutritional quality by increasing vitamin B_{12}.

Reason (R) : LAB, when present in human stomach, check disease causing microbes.

Choose the correct answer from options given below :

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

(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. 161

AAYAM CAREER INSTITUTE

The Test – tube Baby Programme employs which one of the following techniques ?

(1) Intra Cytoplasmic Sperm Injection (ICSI)

(2) Intra Uterine Insemination (IUI)

(3) Gamete Intra Fallopian Transfer (GIFT)

(4) Zygote Intra Fallopian Transfer (ZIFT)

Question no. 162

AAYAM CAREER INSTITUTE

Match List – I with List – II.

List – I		List – II	
A.	Plasmodium	I.	Common cold
B.	Rhino virus	II.	Filariasis
C.	W. bancrofti	III.	Malaria
D.	Microsporum	IV.	Ringworm

Choose the correct answer from options given below :

(1) A – III; B – I; C – II; D - IV

(2) A – IV; B – I; C – II; D - III

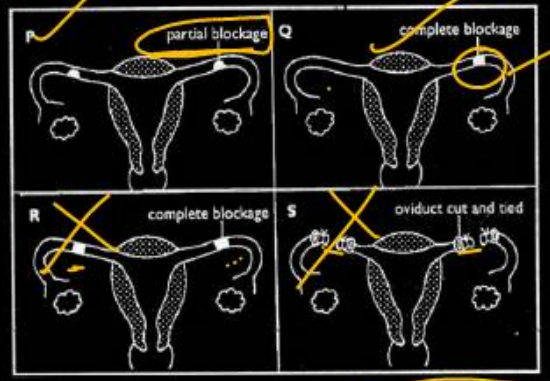
(3) A – III; B – II; C – I; D - IV

(4) A – I; B – III; C – II; D – IV

Question no. 163

AAYAM CAREER INSTITUTE

The given diagram shows the uterine tubes of four women (P, Q, R and S)



In which two women is fertilisation impossible at present ?

(1) P and Q

(2) Q and R

(3) R and S

(4) S and P

Question no. 164

AAYAM CAREER INSTITUTE

Identify the correct function(s) of pills

A. Inhibit ovulation and implantation.

B. Alter the quality of cervical mucus to prevent or retard the entry of sperms.

C. Prevent the ejaculated semen from entering the female vagina

D. Inhibit spermatogenesis

E. Pills are very less effective with high risk of side effects.

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

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

Question no. 165

AAYAM CAREER INSTITUTE

Blastomeres are daughter cells formed in the process of

(1) Cleavage, when zygote undergoes mitotic division

(2) fertilisation, when sperm enters in the cytoplasm of ovum

(3) implantation, when blastocysts attached to the uterine endometrium

(4) gametogenesis, when male and female gametes are produced by testis and ovary respectively

Question no. 166

AAYAM CAREER INSTITUTE

Baculoviruses (Nucleopolyhedrovirus) does not show

(1) host specificity

(2) narrow spectrum applications

(3) effects on non-target pathogens

(4) utility in IPM programe

Question no. 167

AAYAM CAREER INSTITUTE

One of the common symptoms observed in people infected with dengue fever is

(1) significant decrease in RBCs count

(2) significant decrease in WBC count

(3) significant decrease in platelets count

(4) significant increase in platelets count

3

Question no. 168

AAYAM CAREER INSTITUTE

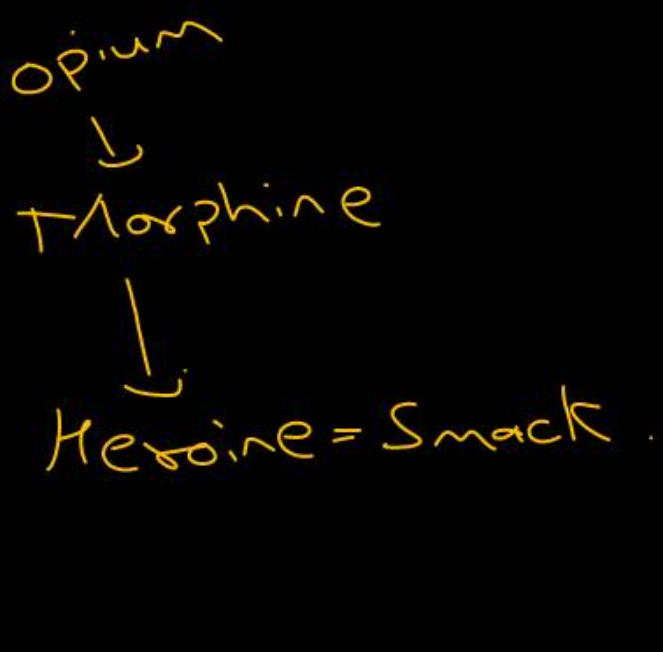
'Smack' is a drug obtained from the

(1) latex of Papaver somniferum

(2) leaves of Cannabis sativa

(3) flowers of Datura pinata

(4) fruits of Erythroxyl coca



Question no. 169

AAYAM CAREER INSTITUTE

Given below are two statements :

Statement I : Lactational amenorrhoea is due to high level of progesterone

Statement II : Progesterone stimulates the release of milk

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. 170

AAYAM CAREER INSTITUTE

Which of the following statements are true for spermatogenesis but do not hold true for Oogenesis ?

A. It results in the formation of haploid gametes

B. Differentiation of gamete occurs after the completion of meiosis

C. Meiosis occurs continuously in a mitotically dividing stem cell population

D. It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary

E. It is initiated at puberty

Choose the correct answer from options given below :

(1) B and C only (2) B, D and E only

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

Question no. 171

AAYAM CAREER INSTITUTE

The chemical test that is used for diagnosis of typhoid is

(1) ELISA test
(2) ESR test
(3) PCR test
(4) Widal test

Question no. 172

AAYAM CAREER INSTITUTE

Release of sperm.

Spermiation is the process of the release of sperms from

(1) seminiferous tubules

(2) vas deferens

(3) epididymis

(4) prostate gland

1

Question no. 173

AAYAM CAREER INSTITUTE

Identify the statement that is correct

A. Antigen – binding site of an antibody is found between two light peptide chains

B. The pathogen of elephantiasis is transmitted to a healthy person through the bite of same mosquito species which also cause malarial disease.

C. Lymphoid tissues are also located within the lining of the major tracts called mucosal – associated lymphoid tissue

D. Increased intake of coffee or tea can cause indigestion, insomnia and disturb renal functions

E. Rheumatoid arthritis is an auto-immune disease

(1) C and E only (2) B and D only

(3) C and D only (4) A and D only

Question no. 174

AAYAM CAREER INSTITUTE

Primary treatment of sewage is

(1) physical process

(2) biological process

(3) chemical process

(4) biochemical process

Sedimentation
Filteration

(1)

Question no. 175

AAYAM CAREER INSTITUTE

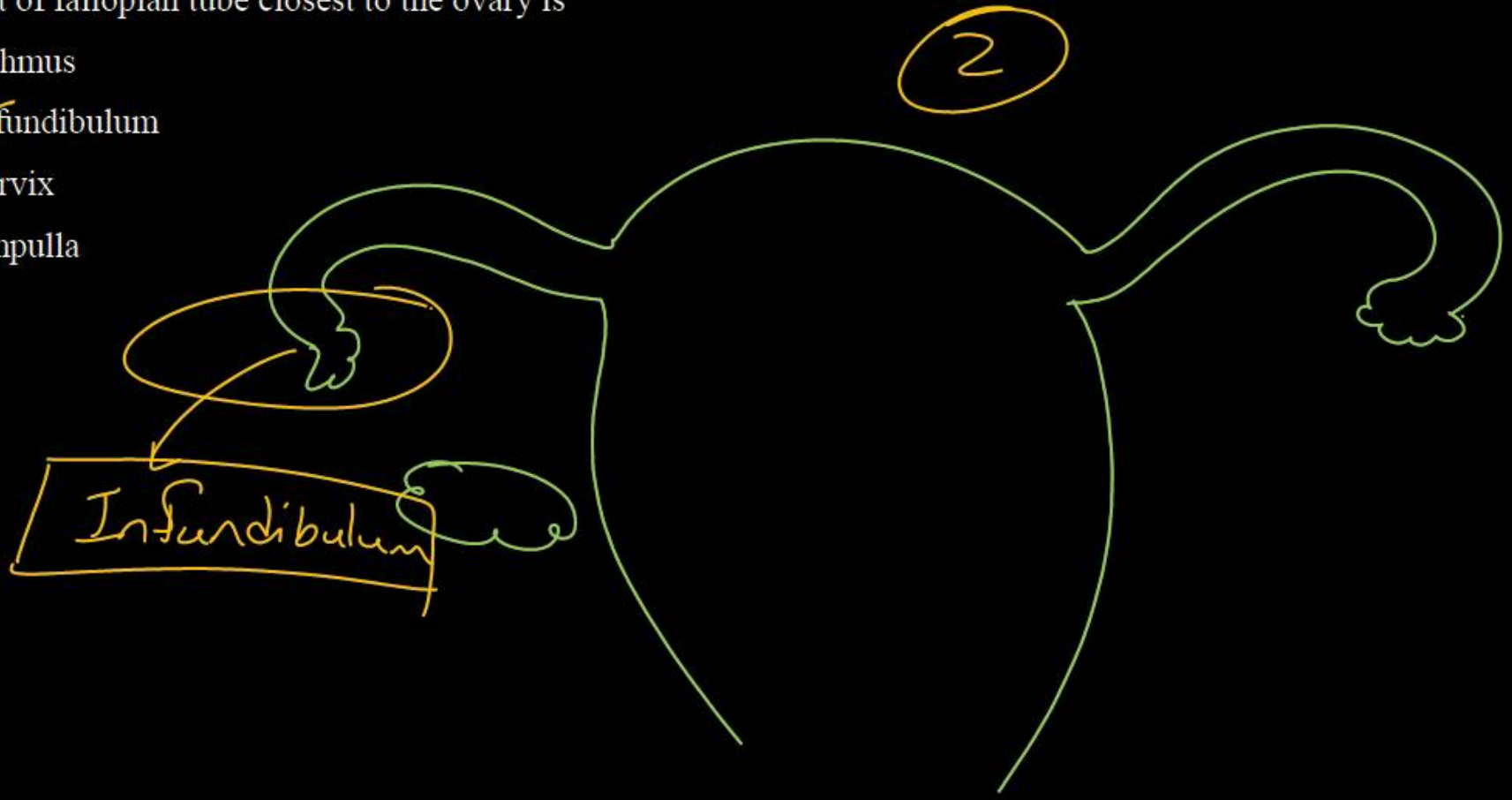
The part of fallopian tube closest to the ovary is

(1) isthmus

(2) infundibulum

(3) cervix

(4) ampulla



Question no. 176

AAYAM CAREER INSTITUTE

Which of the following statements are correct with respect to hormones secreted by placenta ?

A. Placenta secretes relaxin during later stage of pregnancy

B. Placenta secretes high amount of FSH during pregnancy

C. Placenta secretes relaxin during initial stage of pregnancy

D. Placenta secretes hCG and hPL during pregnancy

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

Question no. 177

AAYAM CAREER INSTITUTE

Narcotic drugs like charas, bhang and ganja are extracted from :

(1) Cannabis sativa

(2) Coca plant

(3) Poppy seeds

(4) Hallucinogen

Question no. 178

AAYAM CAREER INSTITUTE

Menstruation is initiated by

(1) a sudden release of FSH from the anterior pituitary

(2) A lack of estrogens and progesterone due to degeneration of the corpus luteum

(3) an increased release of estrogens and progesterone from the corpus luteum

(4) a sudden drop in LH

2

→ Menstrual Flow → Breakdown of endometrium.

Estrogen ≠ Progesterone.

Question no. 179

AAYAM CAREER INSTITUTE

Given below are two statements :

Statement I : Production of LH increases, while that of FSH decreases in the ovulation phase

Statement II : Due to decrease in the level of FSH, ovulation takes place

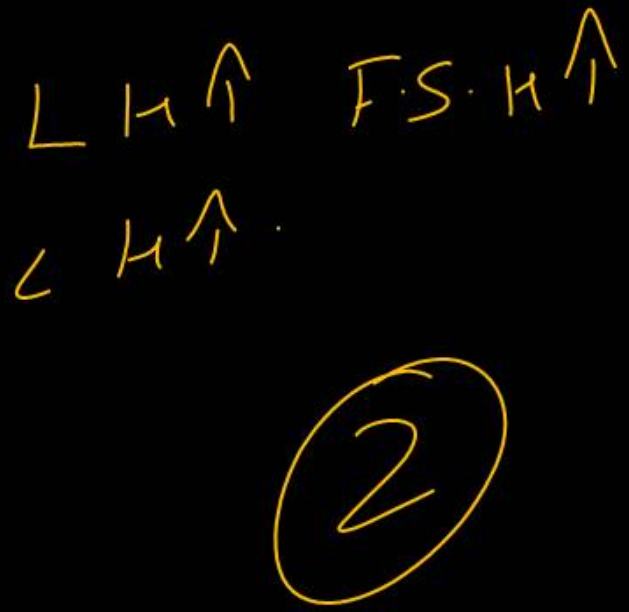
In the light of the above statements, choose the most appropriate answer from the options given below :

(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 incorrect



Question no. 180

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An ideal contraceptive should be

A. user-friendly

B. easily available

C. effective

D. reversible

(1) A only

(2) B and D only

(3) C only

(4) A, B, C and D

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