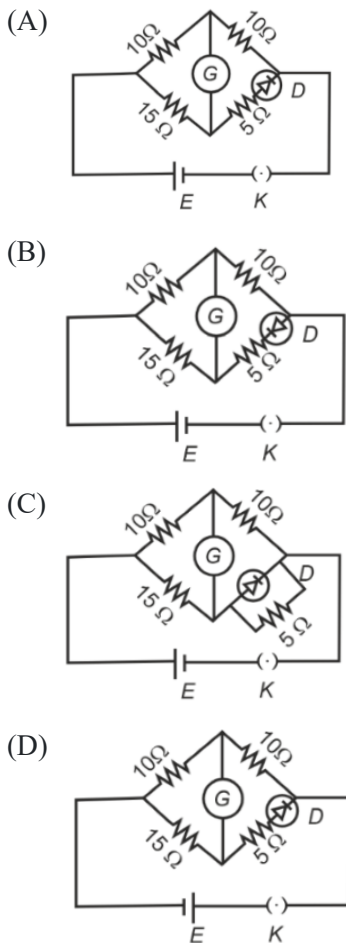


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1. Choose the correct circuit which can achieve the bridge balance.



Correct Option: A

Solution:

In option (1),

$$\frac{10}{15} = \frac{10}{5 + R_D}$$

The diode can conduct and have resistance $R_D = 10\Omega$ because diode have dynamic resistance. In that case bridge will be balanced.

2. Match List-I with List-II.

	List-I (Material)		List-II (Susceptibility (χ))
A.	Diamagnetic	I.	$\chi = 0$
B.	Ferromagnetic	II.	$0 > \chi \geq -1$
C.	Paramagnetic	III.	$\chi \gg 1$

D.	Non-magnetic	IV.	$0 < \chi < \varepsilon$ (a small positive number)
----	--------------	-----	--

Choose the correct answer from the options given below

- (A) A-II, B-III, C-IV, D-I (B) A-II, B-I, C-III, D-IV
(C) A-III, B-II, C-I, D-IV (D) A-IV, B-III, C-II, I

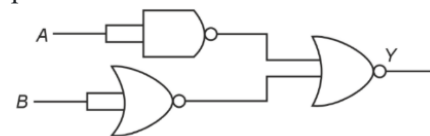
NEET 2

Correct Option: A

Solution:

(Material)		(Susceptibility (χ))
Diamagnetic	(II)	$0 > \chi \geq -1$
Ferromagnetic	(III)	$\chi \gg 1$
Paramagnetic	(IV)	$0 < \chi < \varepsilon$
Non-magnetic	(I)	$\chi = 0$

3. The output (γ) of the given logic gate is similar to the output of an/a

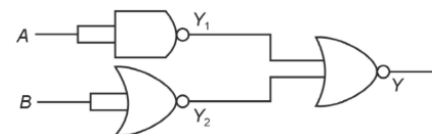


- (A) NAND gate (B) NOR gate (C) OR gate (D) AND gate

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Correct Option: D

Solution:



$$Y_1 = \overline{A \cdot B}$$

$$= \overline{A} \cdot \overline{B}$$

$$Y_2 = \overline{B} + \overline{B}$$

$$= \overline{B}$$

$$Y = \overline{Y_1 + Y_2}$$

$$= \overline{\overline{A} \cdot \overline{B} + \overline{B}}$$

$$= \overline{\overline{A} \cdot \overline{B}}$$

$$= A \cdot B \text{ is similar to output of AND Gate}$$

4. Match List I with List II.

List I (Spectral Lines of Hydrogen for transitions from)		List II (Wavelengths (nm))	
(A)	$n_2 = 3$ to $n_1 = 2$	(I)	410.2
(B)	$n_2 = 4$ to $n_1 = 2$	(II)	434.1
(C)	$n_2 = 5$ to $n_1 = 2$	(III)	656.3
(D)	$n_2 = 6$ to $n_1 = 2$	(IV)	486.1

Choose the correct answer from the options given below:

- (A) A-II, B-I, C-IV, D-III (B) A-III, B-IV, C-II, D-I
(C) A-IV, B-III, C-I, D-II (D) A-I, B-II, C-III, D-IV

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Correct Option: B**Solution:**

$$\text{Energy difference } \Delta E = \frac{hc}{\lambda}$$

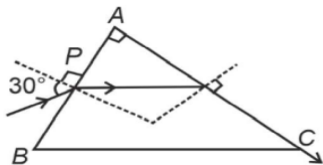
$$\therefore \lambda \propto \frac{1}{\Delta E}$$

$$(\Delta E)_{6-2} > (\Delta E)_{5-2} > (\Delta E)_{4-2} > (\Delta E)_{3-2}$$

$$\lambda_{6-2} < \lambda_{5-2} < \lambda_{4-2} < \lambda_{3-2}$$

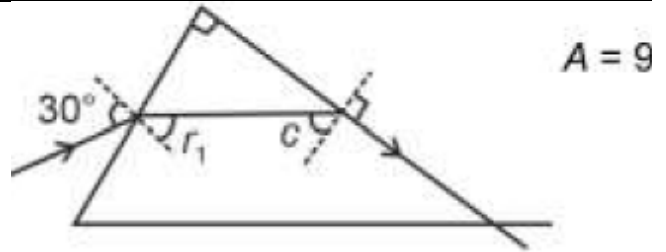
A - III, B - IV, C - II, D - I

5. A light ray enters through a right angled prism at point P with the angle of incidence 30° as shown in figure. It travels through the prism parallel to its base BC and emerges along the face AC. The refractive index of the prism is:



- (A) $\frac{\sqrt{5}}{4}$ (B) $\frac{\sqrt{5}}{2}$
(C) $\frac{\sqrt{3}}{4}$ (D) $\frac{\sqrt{3}}{2}$

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Correct Option: B**Solution:**

In prism, $r_1 + c = A$

$$r_1 = 90^\circ - c \dots\dots(1)$$

$$\sin c = \frac{1}{\mu} \Rightarrow \cos c = \frac{\sqrt{\mu^2 - 1}}{\mu}$$

$\Rightarrow$ Apply Snell's law, on incidence surface

$$1 \cdot \sin 30^\circ = \mu \sin(r_1) \Rightarrow 1 \times \frac{1}{2} = \mu \times \sin(90^\circ - c)$$

$$\frac{1}{2} = \mu \times \frac{\sqrt{\mu^2 - 1}}{\mu}$$

$$\text{On squaring } \frac{1}{4} = \mu^2 - 1$$

$$\Rightarrow \mu^2 = \frac{5}{4} \Rightarrow \mu = \frac{\sqrt{5}}{2}$$

6. In an ideal transformer, the turns ratio is $\frac{N_P}{N_S} = \frac{1}{2}$. The $V_S : V_P$ is equal to (the symbols carry their usual ing):

- (A) 1 : 2 (B) 2 : 1 (C) 1 : 1 (D) 1 : 4

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Correct Option: B**Solution:**

According to transformer ratio,

$$\frac{V_S}{V_P} = \frac{N_S}{N_P} = 2 : 1$$

7. A sheet is placed on a horizontal surface in front of a strong magnetic pole. A force is needed to:
- A. hold the sheet there if it is magnetic.
B. hold the sheet there if it is non-magnetic.
C. move the sheet away from the pole with uniformity if it is conducting.
D. move the sheet away from the pole with uniformity if it is both, non-conducting and non-polar.
Choose the correct statement(s) from the options below:

- (A) B and D only (B) A and C only
(C) A, C and D only (D) C only

NEET 2

Correct Option: B

Solution:

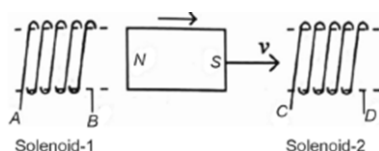
A. A magnetic pole will repel or attract magnetic sheet so force is need.

B. If sheet is non-magnetic, no force needed.

C. If it is conducting, then there will be addy current in sheet, which opposes the motion. So forces is needed move sheet with uniform speed.

D. The non-conducting and non-polar sheet do not interact with magnetic field of magnet.

8.



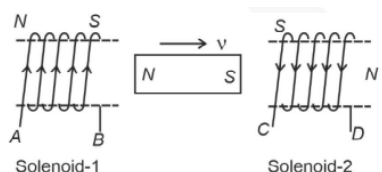
In the above diagram, a strong bar magnet is moving towards solenoid-2 from solenoid-1. The direction of induced current in solenoid-1 and that in solenoid-2, respectively, are through the directions:

(A) AB and (B) BA and (C) AB and (D) BA and
DC CD CD DC

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Correct Option: A

Solution:



North of magnet is moving away from solenoid 1 so end B of solenoid 1 is South and as south of magnet is approaching solenoid 2 so end C of solenoid 2 is South.

9. In a vernier callipers, $(N + 1)$ divisions of vernier scale coincide with N divisions of main scale. If 1 MSD represents 0.1 mm, the vernier constant (in cm) is:

(A) $\frac{1}{10N}$ (B) $\frac{1}{100(N+1)}$
(C) 100 N (D) 10 (N + 1)

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Correct Option: B

Solution:

$$V.C = MSD - VSD$$

$$\text{given: } (N + 1) VSD = N MSD$$

$$VSD = \left(\frac{N}{N+1}\right) MSD$$

$$\text{given : } (N + 1)VSD = N MSD$$

From (1) and (2)

$$V.C = (MSD) - \frac{N}{N+1}(MSD)$$

$$= MSD \left(1 - \frac{N}{N+1}\right) = \frac{MSD}{N+1}$$

$$= \frac{0.01}{N+1} = \frac{1}{100(N+1)}$$

10. A logic circuit provides the output Y as per the foll truth table:

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	0

The expression for the output Y is :

(A) $A \cdot B + \bar{A}$

(B) $A \cdot \bar{B} + \bar{A}$

(C) $\bar{B}$

(D) B

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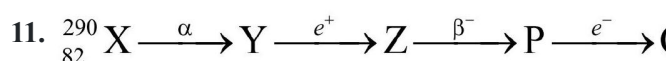
Correct Option: C

Solution:

A	B	Y
0	0	1
0	1	0
1	0	1
1	1	0

According to given truth table, output is independent o value of A

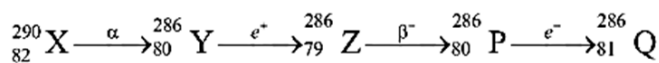
$$\therefore \text{Output } Y = \bar{B}$$



In the nuclear emission stated above, the mass n and atomic number of the product Q respectively, ar

(A) 280, 81 (B) 286, 80 (C) 288, 82 (D) 286,

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Correct Option: D**Solution:**

$$A \rightarrow 286$$

$$Z = 81$$

12. If c is the velocity of light in free space, the correct statements about photon among the following are:

- A. The energy of a photon is $E = h\nu$.
 B. The velocity of a photon is c .
 C. The momentum of a photon, $p = \frac{h\nu}{c}$.
 D. In a photon-electron collision, both total energy and total momentum are conserved.
 E. Photon possesses positive charge.

Choose the correct answer from the options given below:

- (A) A and B only (B) A, B, C and D only
 (C) A, C and D only (D) A, B, D and E only

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Correct Option: B**Solution:**

(A) If c is the velocity of light

so, $E = h\nu$ (Energy of photon)

(B) Velocity of photon is equal to velocity of light i.e. c .

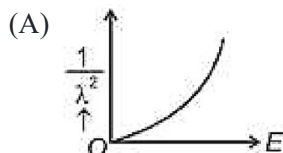
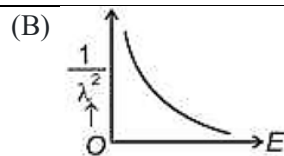
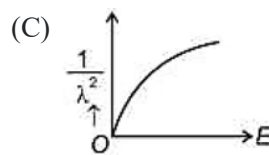
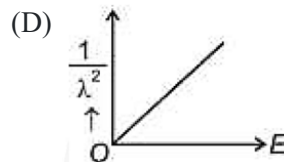
(C) $\lambda = \frac{h}{p}$

$$p = \frac{h}{\lambda}$$

$$p = \frac{h\nu}{c}$$

(D) In photon-electron collision both total energy and total momentum are conserved.

13. The graph which shows the variation of $\left(\frac{1}{\lambda^2}\right)$ and its kinetic energy, E is (where λ is de Broglie wavelength of a free particle):



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Correct Option: D**Solution:**

$$\text{de-Broglie wavelength } \lambda = \frac{h}{p} = \frac{h}{mv} = \frac{h}{\sqrt{2mE}}$$

$$\text{where } E = \frac{1}{2}mv^2$$

Squaring both sides,

$$\lambda^2 = \frac{h^2}{4m^2 E}$$

$$\Rightarrow \frac{1}{\lambda^2} = (\text{constant})E$$

Graph passes through origin with constant

14. Given below are two statements:

Statement I: Atoms are electrically neutral as they contain equal number of positive and negative charges.

Statement II: Atoms of each element are stable and their characteristic spectrum.

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

- (A) Both Statement I and Statement II are correct
 (B) Both Statement I and Statement II are incorrect
 (C) Statement I is correct but Statement II is incorrect
 (D) Statement I is incorrect but Statement II is correct

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Correct Option: C**Solution:**

Statement I is true as atoms are electrically neutral because they contain equal number of positive and negative charges.

Statement II is wrong as atom of most of the elements are stable and emit characteristic spectrum. But this statement is not true for every atom.

15. If the monochromatic source in Young's double slit experiment is replaced by white light, then
- (A) Interference pattern will disappear
 - (B) There will be a central dark fringe surrounded by a few coloured fringes
 - (C) There will be a central bright white fringe surrounded by a few coloured fringes
 - (D) All bright fringes will be of equal width

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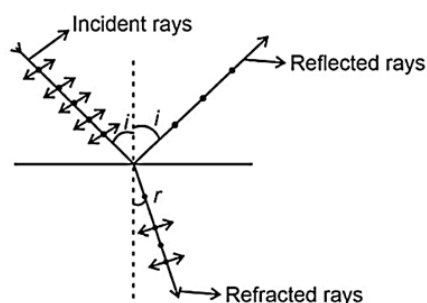
Correct Option: C**Solution:**

At central point on screen, path difference is zero for all wavelength. So, central bright fringe is white and other fringes depend on wavelength as $\beta = \frac{\lambda D}{d}$.

Therefore, other fringes will be coloured.

16. An unpolarised light beam strikes a glass surface at Brewster's angle. Then
- (A) The reflected light will be partially polarised.
 - (B) The refracted light will be completely polarised.
 - (C) Both the reflected and refracted light will be completely polarised.
 - (D) The reflected light will be completely polarised but the refracted light will be partially polarised.

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Correct Option: D**Solution:**

According to Brewster's law, reflected rays are completely polarized and refracted rays are partially polarized.

17. A small telescope has an objective of focal length 140 cm and an eye piece of focal length 5.0 cm. The magnifying power of telescope for viewing a distant object is:

(A) 34 (B) 28 (C) 17 (D) 32

NEET 2

Correct Option: B**Solution:**

$$f_o = 140 \text{ cm and } f_e = 5 \text{ cm}$$

For distant object,

$$m = \frac{f_o}{f_e} = \frac{140}{5} = 28$$

18. The property which is not of an electromagnetic wave travelling in free space is that:

- (A) They are transverse in nature
- (B) The energy density in electric field is equal to energy density in magnetic field
- (C) They travel with a speed equal to $\frac{1}{\sqrt{\mu_0 \epsilon_0}}$
- (D) They originate from charges moving with uniform speed

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Correct Option: D**Solution:**

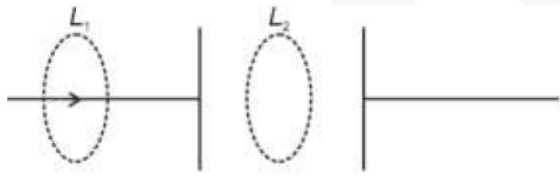
The EM waves originate from an accelerating charge. A charge moving with uniform velocity produces steady magnetic field.

19. A parallel plate capacitor is charged by connecting it to a battery through a resistor. If I is the current in the circuit then in the gap between the plates:

- (A) There is no current
- (B) Displacement current of magnitude equal to I flows in the same direction as I
- (C) Displacement current of magnitude equal to I flows in a direction opposite to that of I
- (D) Displacement current of magnitude greater than I flows but can be in any direction

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Correct Option: B**Solution:**



According to modified Ampere's law

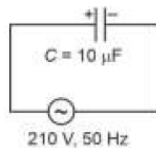
$$\oint B \cdot dl = \mu_0 (I_C + I_D)$$

For Loop L_1 $I_C \neq 0$ and $I_D = 0$

For Loop L_2 $I_C = 0$ and $I_D \neq 0$

Due to KCL $I_C = I_D$

20. A $10\mu\text{F}$ capacitor is connected to a 210 V , 50 Hz source as shown in figure. The peak current in the circuit is nearly ($\pi = 3.14$):



- (A) 0.58 A (B) 0.93 A (C) 1.20 A (D) 0.35 A

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Correct Option: B

Solution:

$$\begin{aligned} \text{Capacitive Reactance } X_C &= \frac{1}{\omega C} = \frac{1}{2\pi f C} = \\ &= \frac{1}{2 \times 3.14 \times 50 \times 10 \times 10^{-6}} \\ &= \frac{1000}{3.14} \end{aligned}$$

$$V_{\text{rms}} = 210\text{ V}$$

$$i_{\text{rms}} = \frac{V_{\text{rms}}}{X_C} = \frac{210}{X_C}$$

$$\text{Peak current} = \sqrt{2} i_{\text{rms}} = \sqrt{2} \times \frac{210}{1000} \times 3.14 = 0.932$$

$$\simeq 0.93\text{ A}$$

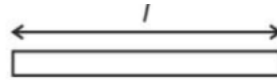
21. An iron bar of length L has magnetic moment M . It is bent at the middle of its length such that the two arms make an angle 60° with each other. The magnetic moment of this new magnet is:

- (A) M (B) $\frac{M}{2}$
(C) $2M$ (D) $\frac{M}{\sqrt{3}}$

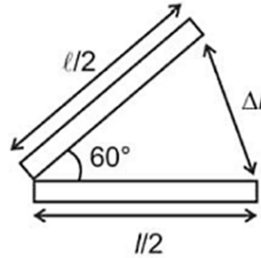
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Correct Option: B

Solution:



$$M = ml$$



$$\begin{aligned} \Delta I &= 2 \times \frac{l}{2} \sin 30^\circ \\ &= \frac{l}{2} \\ M' &= m \frac{l}{2} \\ &= \frac{M}{2} \end{aligned}$$

22. A tightly wound 100 turns coil of radius 10 cm carries a current of 7 A . The magnitude of the magnetic field at the centre of the coil is (Take permeability of free space $4\pi \times 10^{-7}\text{ SI units}$):

- (A) 44 mT (B) 4.4 T (C) 4.4 mT (D) 44 T

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Correct Option: C

Solution:

The magnitude of magnetic field due to circular coil of N turns is given by

$$\begin{aligned} B_C &= \frac{\mu_0 i N}{2R} \\ &= \frac{4\pi \times 10^{-7} \times 7 \times 100}{2 \times 0.1} \\ &= 4.4 \times 10^{-3}\text{ T} \\ &= 4.4\text{ mT} \end{aligned}$$

23. Two heaters A and B have power rating of 1 kW and 2 kW , respectively. These two are first connected in series and then in parallel to a fixed power source. The ratio of power outputs for these two cases is:

- (A) $1 : 1$ (B) $2 : 9$ (C) $1 : 2$ (D) $2 : 9$

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Correct Option: B

Solution:

$$\text{Power Consumed} = P = \frac{V^2}{R}$$

$$\frac{P_A}{P_B} = \frac{R_B}{R_A}$$

$$R_A = 2R_B$$

For Series Combination

$$P_S = \frac{V^2}{3R_B}$$

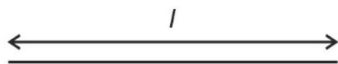
For Parallel Combination

$$P_P = \frac{3V^2}{2R_B}$$

$$\frac{P_S}{P_P} = \frac{2}{9}$$

24. A wire of length 'l' and resistance 100Ω is divided into 10 equal parts. The first 5 parts are connected in series while the next 5 parts are connected in parallel. The two combinations are again connected in series. The resistance of this final combination is:

(A) 26Ω (B) 52Ω (C) 55Ω (D) 60Ω

NEET 2024**Correct Option: B****Solution:**

$$R = \frac{\rho l}{A}$$

$$R' = \frac{\rho l}{10A} = \frac{R}{10}$$

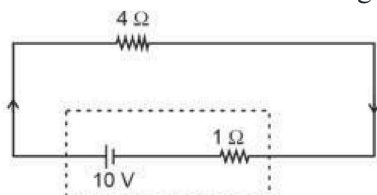
$$R_S = 5 \times \frac{R}{10} \text{ [series]}$$

$$R_P = \frac{R}{50} \text{ [parallel]}$$

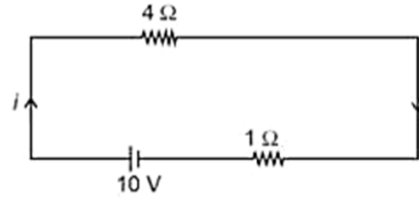
$$R_{eq} = R_S + R_P$$

$$= 52\Omega$$

25. The terminal voltage of the battery, whose emf is 10 V and internal resistance 1Ω , when connected through an external resistance of 4Ω as shown in the figure is:



(A) 4 V (B) 6 V (C) 8 V (D) 10 V

NEET 2**Correct Option: C****Solution:**

$$\text{Current in circuit } i = \frac{10}{4+1} = 2 \text{ A}$$

$$\text{Terminal voltage} = E - iR$$

$$= 10 - 2 \times 1 = 8 \text{ V}$$

26. If the plates of a parallel plate capacitor connected to a battery are moved close to each other, then
- the charge stored in it, increases.
 - the energy stored in it, decreases.
 - its capacitance increases.
 - the ratio of charge to its potential remains the same.
 - the product of charge and voltage increases.
- Choose the most appropriate answer from the options given below:

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

NEET 2**Correct Option: B****Solution:**

$$\text{Given } V' = V = \text{Constant}$$

$$(i) C' = \frac{\epsilon_0 A}{d'}, \quad C = \frac{\epsilon_0 A}{d}$$

$$d' < d$$

$$C' > C$$

Hence, final capacitance greater than initial capacitance

$$(ii) U' = \frac{1}{2} C' V^2$$

$$U = \frac{1}{2} C V^2$$

$$U' > U$$

Hence final energy is greater than initial energy

$$(iii) \frac{Q'}{V'} = C' \text{ and } \frac{Q}{V} = C$$

$$\frac{Q'}{V'} \neq \frac{Q}{V}$$

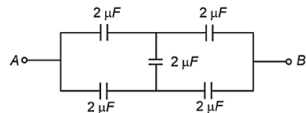
(iv) Product of charge and voltage

$$X' = Q' V = C' V^2$$

$$X = Q V = C V^2$$

$$X' > X$$

27. In the following circuit, the equivalent capacitance between terminal A and terminal B is :

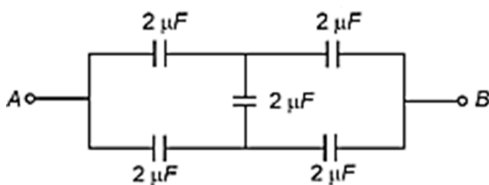


- (A) $2\mu\text{F}$ (B) $1\mu\text{F}$
(C) $0.5\mu\text{F}$ (D) $4\mu\text{F}$

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Correct Option: A

Solution:



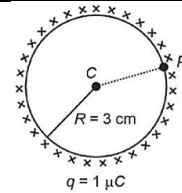
Given circuit is balanced Wheatstone bridge



$$C_{AB} = 1 + 1 = 2\mu\text{F}$$

28. A thin spherical shell is charged by some source. The potential difference between the two points C and P (in V) shown in the figure is:

$$\left(\text{Take } \frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ SI units}\right)$$



- (A) 3×10^5 (B) 1×10^5
(C) 0.5×10^5 (D) Zero

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Correct Option: D

Solution:

For uniformly charged spherical shell,

$$V = \frac{kq}{R} \quad (\text{For } r \leq R)$$

$$\therefore V_C = V_P$$

$$V_C - V_P = \text{Zero}$$

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

Assertion A: The potential (V) at any axial point, at distance (r) from the centre of the dipole of dipole moment vector $\vec{p}$ of magnitude, $4 \times 10^{-6} \text{ Cm}$, is 10^3 V .

(Take $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{ SI units}$)

Reason R: $V = \pm \frac{2P}{4\pi\epsilon_0 r^2}$, where r is the distance of axial point, situated at 2 m from the centre of the dipole. In the light of the above statements, choose the correct answer from the options given below:

- (A) Both A and R are true and R is the correct explanation of A.
(B) Both A and R are true and R is NOT the correct explanation of A.
(C) A is true but R is false.
(D) A is false but R is true.

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Correct Option: C

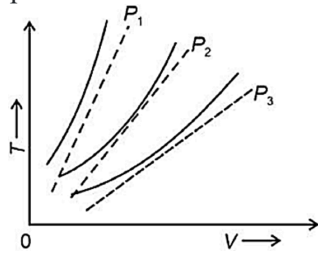
Solution:

The potential V at any point, at distance r from centre of dipole = $\frac{KP \cos \theta}{r^2}$

At axial point where $\theta = 0^\circ$, $V = \frac{KP}{r^2} = \frac{9 \times 10^9 \times 4 \times 10^{-6}}{2^2} = 9 \times 10^3 \text{ V}$

At axial point where $\theta = 180^\circ$, $V = \frac{-KP}{r^2} = -9 \times 10^3$

30. The following graph represents the $T - V$ curves of an ideal gas (where T is the temperature and V the volume) at three pressures P_1, P_2 and P_3 compared with those of Charles's law represented as dotted lines.



Then the correct relation is :

- (A) $P_3 > P_2 > P_1$ (B) $P_1 > P_3 > P_2$
(C) $P_2 > P_1 > P_3$ (D) $P_1 > P_2 > P_3$

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Correct Option: A

Solution:

At same temperature, curve with higher volume corresponds to lower pressure.

$$V_3 > V_2 > V_1$$

$$\Rightarrow P_1 > P_2 > P_3$$

(We draw a straight line parallel to volume axis to get this)

31. If the mass of the bob in a simple pendulum is increased to thrice its original mass and its length is made half its original length, then the new time period of oscillation is $\frac{x}{2}$ times its original time period. Then the value of x is:

- (A) $\sqrt{3}$ (B) $\sqrt{2}$
(C) $2\sqrt{3}$ (D) 4

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Correct Option: B

Solution:

$$T' = 2\pi\sqrt{\frac{\ell'}{g}} \text{ where } \ell' = \frac{\ell}{2}$$

$$T = 2\pi\sqrt{\frac{\ell}{g}}$$

$$T' = \frac{x}{2} T$$

$$2\pi\sqrt{\frac{\ell}{2g}} = \frac{x}{2} 2\pi\sqrt{\frac{\ell}{g}}$$

$$\frac{1}{\sqrt{2}} = \frac{x}{2} \Rightarrow x = \sqrt{2}$$

32. If $x = 5 \sin(\pi t + \frac{\pi}{3})$ m represents the motion of a particle executing simple harmonic motion, the amplitude and time period of motion, respectively, are

- (A) 5 cm, 2 s (B) 5 m, 2 s
(C) 5 cm, 1 s (D) 5 m, 1 s

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Correct Option: B

Solution:

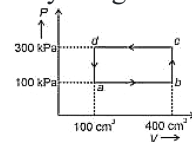
$$x = 5 \sin(\pi t + \frac{\pi}{3}) \text{ m}$$

$$\text{Amplitude} = 5 \text{ m}$$

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

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

33. A thermodynamic system is taken through the path abcd. The work done by the gas along the path bc is



- (A) Zero (B) 30 J (C) -90 J (D) -60

NEET 2

Correct Option: A

Solution:

Path bc is an isochoric process.

$\therefore$ Work done by gas along path bc is zero.

34. The maximum elongation of a steel wire of 1 m length is at the elastic limit of steel and its Young's modulus, respectively, are $8 \times 10^8 \text{ Nm}^{-2}$ and $2 \times 10^{11} \text{ N m}^{-2}$, is:

- (A) 4 mm (B) 0.4 mm (C) 40 mm (D) 8 mm

NEET 2

Correct Option: A

Solution:

In the case for maximum elongation,

Stress = Elastic limit

$$\delta_{\max} = \frac{\sigma_{\text{elastic}} \times L}{\text{Young's modulus}} = \frac{8 \times 10^8 \times 1}{2 \times 10^{11}} = 4 \times 10^{-3} \text{ m}$$

$$n = 4 \text{ mm}$$

i.e. maximum elongation is 4 mm

35. The minimum energy required to launch a satellite of mass m from the surface of earth of mass M and radius R in a circular orbit at an altitude of $2R$ from the surface of the earth is:

(A) $\frac{5GmM}{6R}$ (B) $\frac{2GmM}{3R}$
(C) $\frac{GmM}{2R}$ (D) $\frac{GmM}{3R}$

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Correct Option: A**Solution:**

Apply energy conservation,

$$\begin{aligned}
 U_i + K_i &= U_f + K_f \\
 \Rightarrow -\frac{GMIm}{R} + K_i &= -\frac{GMIm}{3R} + \frac{1}{2}mv^2 \\
 \Rightarrow -\frac{GMm}{R} + K_i &= -\frac{GMm}{3R} + \frac{1}{2} \times m \times \frac{GM}{3R} \\
 \Rightarrow K_i &= -\frac{1}{6} \frac{GMm}{R} + \frac{GMm}{R} \\
 K_i &= \frac{5}{6} \frac{GMm}{R}
 \end{aligned}$$

36. The mass of a planet is $\frac{1}{10}$ th that of the earth and its diameter is half that of the earth. The acceleration due to gravity on that planet is:

(A) 19.6 m s^{-2}
(B) 9.8 m s^{-2}
(C) 4.9 m s^{-2}
(D) 3.92 m s^{-2}

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Correct Option: D**Solution:**

$$\begin{aligned}
 g' &= \frac{GM'}{R'^2} = \frac{GM}{10 \left(\frac{R}{2}\right)^2} \\
 &= \frac{4}{10} \frac{GM}{R^2} = 0.4 \times 9.8 \\
 &= 3.92 \text{ m s}^{-2}
 \end{aligned}$$

37. The moment of inertia of a thin rod about an axis passing through its mid point and perpendicular to the rod is 2400 g cm^2 . The length of the 400 g rod is nearly:

(A) 8.5 cm (B) 17.5 cm (C) 20.7 cm (D) 72.0 cm

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Correct Option: A**Solution:**

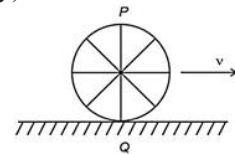
$$\text{Moment of inertia of rod} = I = \frac{m\ell^2}{12}$$

$$\Rightarrow 2400 = 400 \frac{\ell^2}{12}$$

$$\Rightarrow 72 = \ell^2$$

$$\Rightarrow \ell = \sqrt{72} = 8.48 \text{ cm} \simeq 8.5 \text{ cm}$$

38. A wheel of a bullock cart is rolling on a level road as shown in the figure below. If its linear speed is v in the direction shown, which one of the following options is correct (P and Q are any highest and lowest points of the wheel, respectively)?

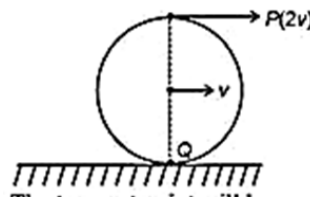


- (A) Point P moves slower than point Q
(B) Point P moves faster than point Q
(C) Both the points P and Q move with equal speed
(D) Point P has zero speed

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Correct Option: B**Solution:**

In the case of pure rolling,



The topmost point will have velocity $2v$ while point Q (lowest point) will have zero velocity. Hence point P moves faster than point Q.

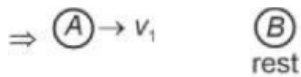
39. Two bodies A and B of same mass undergo complete inelastic one dimensional collision. The body A moves with velocity v_1 while body B is at rest before collision. The velocity of the system after collision is v_2 . The ratio $v_1 : v_2$ is

(A) $1 : 2$ (B) $2 : 1$ (C) $4 : 1$ (D) $1 : 4$

NEET 2

Correct Option: B**Solution:**

Before collision



It undergoes completely inelastic collision Using conservation of linear momentum

Initial momentum = Final momentum

$$\Rightarrow mv_1 = mv_2 + mv_2$$

$$\Rightarrow mv_1 = 2mv_2$$

$$\Rightarrow \frac{v_1}{v_2} = \frac{2}{1}$$

40. At any instant of time t , the displacement of any particle is given by $2t - 1$ (SI unit) under the influence of force of 5 N. The value of instantaneous power is (in SI unit):

(A) 10 (B) 5 (C) 7 (D) 6

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Correct Option: A**Solution:**

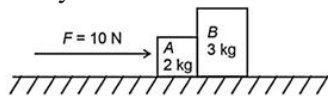
$$x = 2t - 1$$

$$= \frac{dx}{dt} = 2 \text{ m/s}$$

$$P = F \cdot v$$

$$= 5 \times 2 = 10 \text{ W}$$

41. A horizontal force 10 N is applied to a block A as shown in figure. The mass of blocks A and B are 2 kg and 3 kg respectively. The blocks slide over a frictionless surface. The force exerted by block A on block B is :



(A) Zero (B) 4 N (C) 6 N (D) 10 N

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Correct Option: C**Solution:**

$$F = (M_1 + M_2) a$$

$$a = \frac{10}{2 + 3} = 2 \text{ ms}^{-2}$$

$$F' = M_2(2) = 3 \times 2 \text{ N} = 6 \text{ N}$$

42. A force defined by $F = \alpha t^2 + \beta t$ acts on a particle at a given time t . The factor which is dimensionless, if α and β are constants, is:

(A) $\beta t / \alpha$ (B) $\alpha t / \beta$

(C) $\alpha \beta t$ (D) $\alpha \beta / t$

NEET 2

Correct Option: B**Solution:**

From principle of homogeneity

$$[F] = [\alpha t^2] = [\beta t]$$

$$[\alpha] = \frac{[F]}{[t^2]} \text{ and } [\beta] = \frac{[F]}{[t]}$$

$$\therefore [\alpha][t] = [\beta]$$

$$\therefore \frac{\alpha t}{\beta} = \text{dimensionless}$$

43. The quantities which have the same dimensions as of solid angle are:

(A) strain and angle (B) stress and angle
(C) strain and arc (D) angular speed and

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Correct Option: A**Solution:**Solid angle $d\Omega = \frac{dA}{r^2}$ has dimension $[M^0 L^0 T^0]$.Strain = $\frac{\Delta l}{l}$ has dimensions $[M^0 L^0 T^0]$.

Angle measured in radians is also dimensionless

$$[M^0 L^0 T^0].$$

$$\theta = \frac{l}{r}$$

44. A thin flat circular disc of radius 4.5 cm is placed over the surface of water. If surface tension of water is 0.07 N/m, then the excess force required to take it from the surface is:

(A) 19.8 mN (B) 198 N (C) 1.98 mN (D) 99 mN

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Correct Option: A**Solution:**

45. A particle moving with uniform speed in a circular path maintains

(A) Constant velocity
(B) Constant acceleration

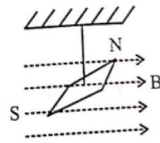
- (C) Constant velocity and varying acceleration
(D) Varying velocity and varying acceleration

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Correct Option: D**Solution:**

Both velocity and acceleration vary in direction.

46. In a uniform magnetic field of 0.049 T, a magnetic needle performs 20 complete oscillations in 5 seconds as shown. The moment of inertia of the needle is $9.8 \times 10^{-6} \text{ kg m}^2$. If the magnitude of magnetic moment of the needle is $x \times 10^{-5} \text{ Am}^2$, then the value of 'x' is :



- (A) $5\pi^2$ (B) $128\pi^2$
(C) $50\pi^2$ (D) $1280\pi^2$

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Correct Option: D**Solution:**

$$\text{Time period of oscillation, } T = 2\pi\sqrt{\frac{I}{MB}}$$

$$\Rightarrow \frac{1}{4} = 2\pi\sqrt{\frac{9.8 \times 10^{-6}}{M \times 0.049}}$$

$$\Rightarrow \frac{1}{16} = 4\pi^2 \times \frac{9.8 \times 10^{-6}}{M \times 49 \times 10^{-3}}$$

$$\Rightarrow M = \frac{4\pi^2 \times 9.8 \times 10^{-6}}{49 \times 10^{-3}} \times 16$$

$$\Rightarrow \frac{4\pi^2 \times 9.8 \times 16 \times 10^{-3}}{49}$$

$$= 12.8\pi^2 \times 10^{-3} \times 10^{-2} \times 10^2$$

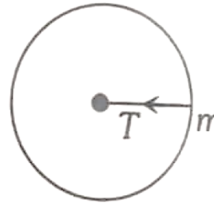
$$= 1280\pi^2 \times 10^{-5} \text{ Am}^2$$

$$\therefore x = 1280\pi^2$$

47. A bob is whirled in a horizontal plane by means of a string with an initial speed of $\omega \text{ rpm}$. The tension in the string is T. If speed becomes 2ω while keeping the same radius, the tension in the string becomes

- (A) T (B) 4T
(C) $\frac{T}{4}$ (D) $\sqrt{2}T$

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Correct Option: B**Solution:**

$$F_{cp} = ma_{cp}$$

$$F_{cp} = m\omega^2 r$$

$$T = m\omega^2 r$$

Now speed becomes ' 2ω '

$$T' = m(2\omega)^2 r \Rightarrow T' = 4m\omega^2 r \Rightarrow T' = 4T$$

48. A metallic bar of Young's modulus, $0.5 \times 10^{11} \text{ Nm}^{-2}$, coefficient of linear thermal expansion $10^{-5} \text{ }^\circ\text{C}^{-1}$, 1 m and area of cross-section 10^{-3} m^2 is heated 0°C to 100°C without expansion or bending. The pressive force developed in it is

- (A) $5 \times 10^3 \text{ N}$ (B) $50 \times 10^3 \text{ N}$
(C) $100 \times 10^3 \text{ N}$ (D) $2 \times 10^3 \text{ N}$

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Correct Option: B**Solution:**

Given,

Young's modulus, $Y = 0.5 \times 10^{11} \text{ Nm}^{-2}$

Coefficient of linear thermal expansion,

$$\alpha = 10^{-5} \text{ }^\circ\text{C}^{-1}$$

Length, $l = 1 \text{ m}$ Area of cross-section, $A = 10^{-3} \text{ m}^2$

$$\Delta T = 100^\circ\text{C}$$

$$\text{We know that, stress} = Y \cdot \frac{\Delta l}{l}$$

Here,

$$\Delta l = l \alpha \Delta T$$

$$= 1 \times 10^{-5} \times 100 = 10^{-3}$$

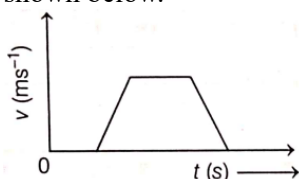
$$\Rightarrow \frac{F}{A} = Y \cdot \frac{10^{-3}}{1}$$

Compressive force,

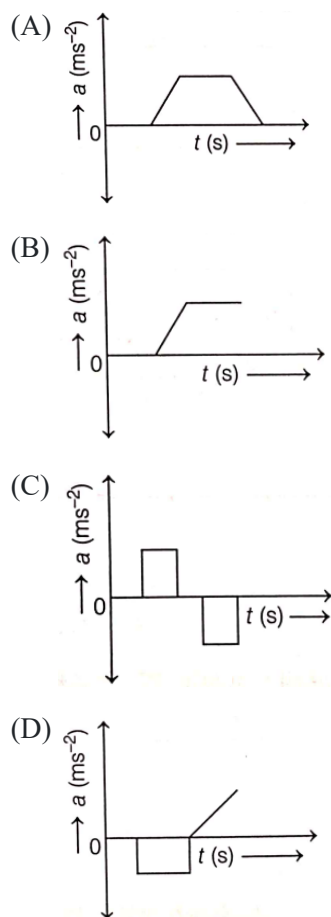
$$F = 0.5 \times 10^{11} \times 10^{-3} \times 10^{-3}$$

$$= 0.5 \times 10^5 = 50 \times 10^3 \text{ N}$$

49. The velocity v -time t plot of the motion of a body is shown below.



The acceleration a -time t graph that best suits this motion is



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Correct Option: C

Solution:

We know that

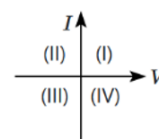
$$a = \frac{dv}{dt}$$

For $v = \text{constant}$, $a = 0$

Thus, for $v-t$ graph when v is positive and linearly increasing a will be positive constant and if v is decreasing linearly a will be negative constant.

Hence, option (c) is correct.

50. Consider the following Statements **A** and **B** and identify the correct answer:



A. For a solar-cell, the $I-V$ characteristics lies in IV quadrant of the given graph. B. In a reverse-biased junction diode, the current measured in (μA), is due to majority charge carriers.

- (A) **A** is incorrect but **B** is correct.
 (B) Both A and B are correct.
 (C) Both A and B are incorrect.
 (D) A is correct but B is incorrect.

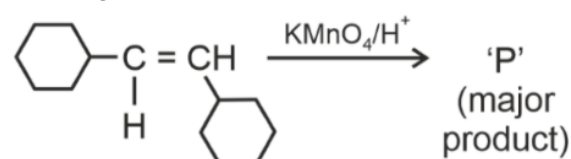
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Correct Option: D

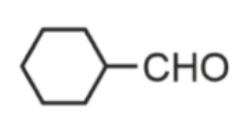
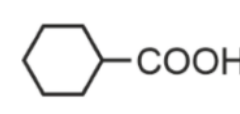
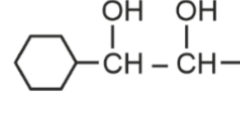
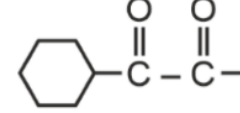
Solution:

Solution not Required.

51. For the given reaction:



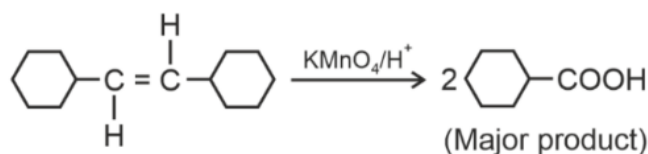
'P' is

- (A) 
- (B) 
- (C) 
- (D) 

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Correct Option: B

Solution:



52. The plot of osmotic pressure (Π) vs concentration (mol L^{-1}) for a solution gives a straight line with slope $25.73 \text{ L bar mol}^{-1}$. The temperature at which the osmotic pressure measurement is done is (Use $R = 0.083 \text{ L bar mol}^{-1} \text{ K}^{-1}$)

- (A) 37°C (B) 310°C
(C) 25.73°C (D) 12.05°C

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Correct Option: A**Solution:**

$$\Pi = CRT$$

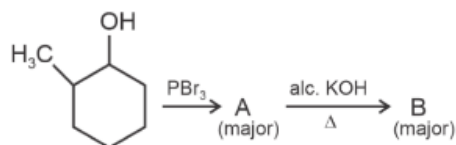
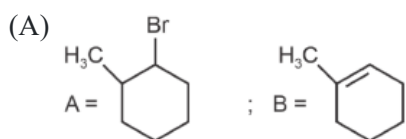
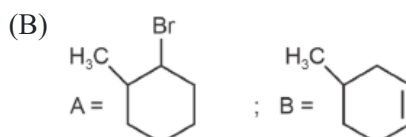
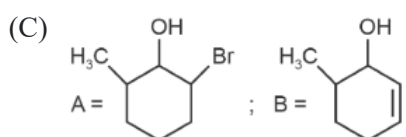
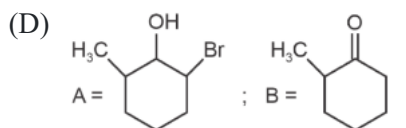
$$\text{Slope} = RT$$

$$25.73 = 0.083 \times T$$

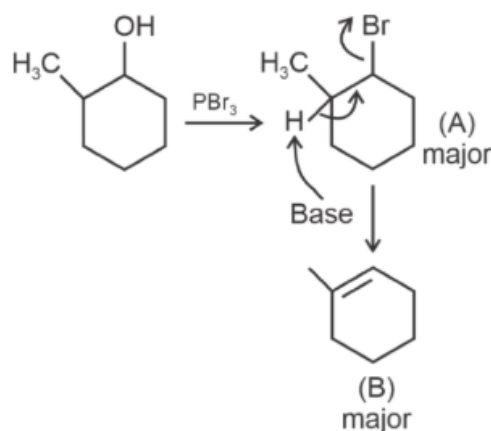
$$T = \frac{25.73}{0.083} = 309.47 \approx 310 \text{ K}$$

$$\therefore \text{Temperature in } ^\circ\text{C} = 310 - 273 = 37^\circ\text{C}$$

53. Major products A and B formed in the following reaction sequence, are



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Correct Option: A**Solution:**

54. In which of the following processes entropy increases
A. A liquid evaporates to vapour.
B. Temperature of a crystalline solid lowered from to 0 K.
C. $2\text{NaHCO}_3(\text{s}) \rightarrow \text{Na}_2\text{CO}_3(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
D. $\text{Cl}_2(\text{g}) \rightarrow 2\text{Cl}(\text{g})$
Choose the correct answer from the options given below

- (A) A and D (B) A, B and D
(C) A, C and D (D) C and D

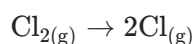
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Correct Option: C**Solution:**

When a liquid evaporates to vapour entropy increases.



Number of gaseous product molecules increases so entropy increases.



1 mole $\text{Cl}_2(\text{g})$ form $2\text{molCl}(\text{g})$. So entropy increases.

55. Match List I with List II.

	List I (Complex)		List II (Type of isomerism)
A.	$[\text{Co}(\text{NH}_3)_5(\text{NO}_2)]\text{Cl}$	I.	Solvate isomerism
B.	$[\text{Co}(\text{NH}_3)_5(\text{SO}_4)]\text{Br}$	II.	Linkage isomerism
C.	$[\text{Co}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$	III.	Ionization isomerism

D.	$[\text{Co}(\text{H}_2\text{O})_6]\text{Cl}_3$	IV.	Coordination isomerism
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Choose the correct answer from the options given below:

- (A) A-II, B-III, C-IV, D-I (B) A-I, B-III, C-IV, D-II
(C) A-I, B-IV, C-III, D-II (D) A-II, B-IV, C-III, D-I

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Correct Option: A

Solution:

A.	$[\text{Co}(\text{NH}_3)_5(\text{NO}_2)]\text{Cl}_2$	II.	Linkage isomerism due to 'N' and 'O' linkage by NO_2
B.	$[\text{Co}(\text{NH}_3)_5(\text{SO}_4)]\text{Br}$	III.	Ionization isomerism
C.	$[\text{Co}(\text{NH}_3)_6][\text{Cr}(\text{CN})_6]$	IV.	Coordination isomerism
D.	$[\text{Co}(\text{H}_2\text{O})_6]\text{Cl}_3$	I.	Solvate isomerism

56. On heating, some solid substances change from solid to vapour state without passing through liquid state. The technique used for the purification of such solid substances based on the above principle is known as

- (A) Crystallization (B) Sublimation
(C) Distillation (D) Chromatography

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Correct Option: B

Solution:

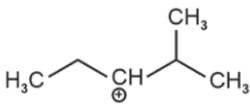
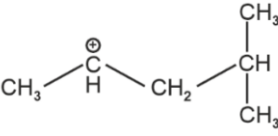
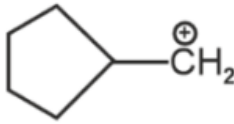
(1) Crystallization : It is based on difference in the solubilities of the compound and impurities in a suitable solvent.

(2) Sublimation : It is the purification technique based on principle that on heating, some solid substances change from solid to vapour state without passing through liquid state.

(3) Distillation : It is used to separate volatile liquids from non-volatile impurities and the liquids having sufficient difference in their boiling point.

(4) Chromatography : It is based on separation by using stationary and mobile phase.

57. The most stable carbocation among the following is :

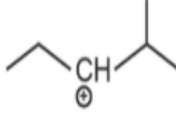
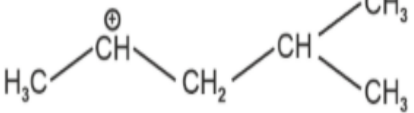
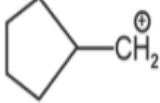
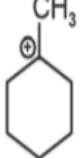
- (A) 
- (B) 
- (C) 
- (D) 

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Correct Option: D

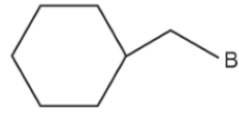
Solution:

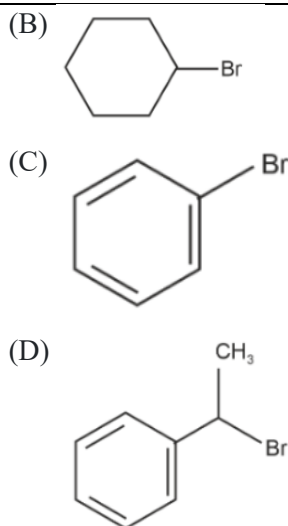
The stability of carbocation can be described by the hyperconjugation. Greater the extent of hyperconjugation more is the stability of carbocation.

- (1)  $\rightarrow 3 \alpha\text{-H}$
- (2)  $\rightarrow 5 \alpha\text{-H}$
- (3)  $\rightarrow 1 \alpha\text{-H}$
- (4)  $\rightarrow 7 \alpha\text{-H}$

Stability order of carbocations = (4) > (2) > (1) > (3)

58. The compound that will undergo $\text{S}_{\text{N}}1$ reaction with the fastest rate is

- (A) 

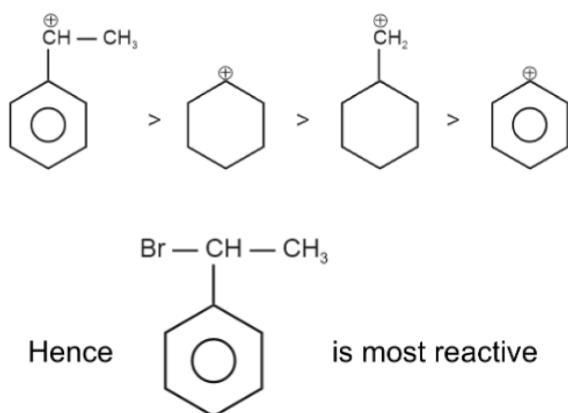


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Correct Option: D**Solution:**

Reactivity towards S_N1 depends upon stability of carbocation.

Order of stability is



59. A compound with a molecular formula of C_6H_{14} has two tertiary carbons. Its IUPAC name is :

- (A) n-hexane (B) 2-methylpentane
(C) 2,3-dimethylbutane (D) 2,2-dimethylbutane

NEET 2024

Correct Option: C**Solution:**

$CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$ has no tertiary carbon (n-Hexane)

$H_3C-CH_2-CH_2-\underset{\substack{| \\ CH_3}}{CH}-CH_3$ has only one tertiary carbon (2-Methylpentane)

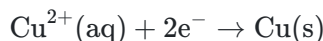
$H_3C-\underset{\substack{| \\ CH_3}}{CH}-\underset{\substack{| \\ CH_3}}{CH}-CH_3$ has two tertiary carbons (2,3-Dimethylbutane)

$H_3C-\underset{\substack{| \\ CH_3}}{\overset{\substack{| \\ CH_3}}{C}}-CH_2-CH_3$ has no tertiary carbon (2,2-Dimethylbutane)

60. Mass in grams of copper deposited by passing 9.648 C current through a voltmeter containing copper sulphate solution for 100 seconds is (Given : Molar mass of Cu = 63 g mol⁻¹, 1 F = 96487 C)

- (A) 3.15 g (B) 0.315 g (C) 31.5 g (D) 0.03 g

NEET 2

Correct Option: B**Solution:**

$$\text{Mass of Cu deposited (w)} = \frac{M \times i \times t}{nF}$$

$$= \frac{63 \times 9.6487 \times 100}{2 \times 96487}$$

$$= 0.315 \text{ g}$$

61. The rate of a reaction quadruples when temperature changes from 27°C to 57°C. Calculate the energy of activation.

(Given $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$, $\log 4 = 0.6021$)

- (A) 38.04 kJ/mol
(B) 380.4 kJ/mol
(C) 3.80 kJ/mol
(D) 3804 kJ/mol

NEET 2

Correct Option: A**Solution:**

$$\log \left(\frac{k_2}{k_1} \right) = \frac{E_a}{2.303R} \left(\frac{1}{T_1} - \frac{1}{T_2} \right)$$

$$\log\left(\frac{4}{1}\right) = \frac{E_a}{2.303R} \left(\frac{1}{300} - \frac{1}{330}\right)$$

$$E_a = \frac{(\log(4)) \times 2.303 \times 8.314 \times 300 \times 330}{30}$$

$$= 3.804 \times 10^4 \text{ J/mol}$$

$$= 38.04 \text{ kJ/mol}$$

62. Activation energy of any chemical reaction can be calculated if one knows the value of

- (A) rate constant at standard temperature
- (B) probability of collision
- (C) orientation of reactant molecules during collision
- (D) rate constant at two different temperatures

NEET 2024

Correct Option: D

Solution:

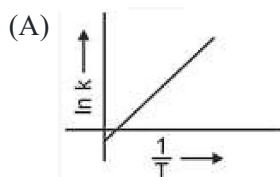
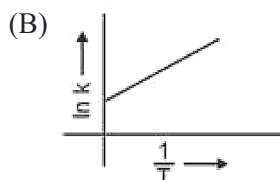
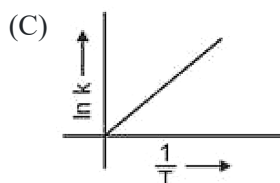
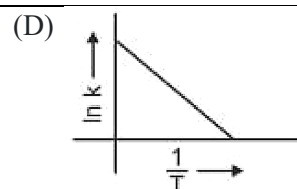
To calculate value of E_a

Equation used is

$$\log\left(\frac{k_2}{k_1}\right) = \frac{E_a}{2.303R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$$

Hence E_a can be calculated if value of rate constant k is known at two different temperatures T_1 and T_2 .

63. Which plot of $\ln k$ vs $\frac{1}{T}$ is consistent with Arrhenius equation?



NEET 2

Correct Option: D

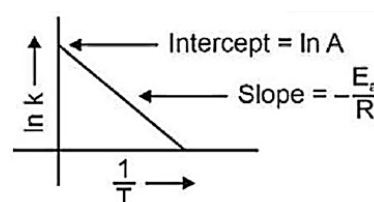
Solution:

The Arrhenius equation is given as

$$k = Ae^{-\frac{E_a}{RT}}$$

$$\therefore \ln k = \ln A - \frac{E_a}{RT}$$

$\ln k$ v/s $\left(\frac{1}{T}\right)$ gives a straight line graph with slope = - and intercept = $\ln A$



64. The pair of lanthanoid ions which are diamagnetic is:

- (A) Ce^{4+} and Yb^{2+}
- (B) Ce^{3+} and Eu^{2+}
- (C) Gd^{3+} and Eu^{3+}
- (D) Pm^{3+} and Sm^{3+}

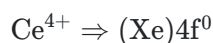
NEET 2

Correct Option: A

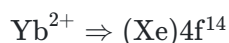
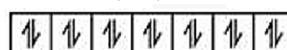
Solution:

$$\text{Magnetic moment } \mu = \sqrt{n(n+2)}$$

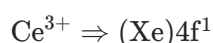
$n \rightarrow$ number of unpaired electron

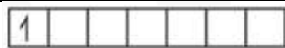


$\mu = 0$ Diamagnetic

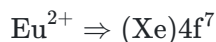
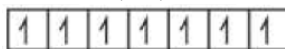


$\mu = 0$ Diamagnetic

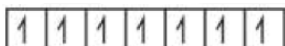




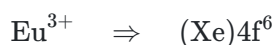
$$\mu = \sqrt{3} \quad \text{Paramagnetic}$$



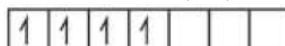
$$\mu = \sqrt{63} \quad \text{Paramagnetic}$$



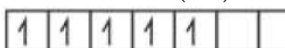
$$\mu = \sqrt{63} \quad \text{Paramagnetic}$$



$$\mu = \sqrt{48} \quad \text{Paramagnetic}$$



$$\mu = \sqrt{24} \quad \text{Paramagnetic}$$



$$\mu = \sqrt{35} \quad \text{Paramagnetic}$$

Hence Ce^{4+} and Yb^{2+} are only diamagnetic.

65. The E° value for the $\text{Mn}^{3+}/\text{Mn}^{2+}$ couple is more positive than that of $\text{Cr}^{3+}/\text{Cr}^{2+}$ or $\text{Fe}^{3+}/\text{Fe}^{2+}$ due to change of

- (A) d^5 to d^4 configuration
 (B) d^5 to d^2 configuration
 (C) d^4 to d^5 configuration
 (D) d^3 to d^5 configuration

NEET 2024

Correct Option: C

Solution:

$$E_{\text{Mn}^{3+}/\text{Mn}^{2+}}^0 > E_{\text{Cr}^{3+}/\text{Cr}^{2+}}^0 \text{ or } E_{\text{Fe}^{3+}/\text{Fe}^{2+}}^0$$



As Mn^{3+} from d^4 configuration goes to more stable d^5 configuration (half filled), due to more exchange energy d^5 configuration.

66. Given below are two statements : [NEET(UG) 2024]

Statement I:

$[\text{Co}(\text{NH}_3)_6]^{3+}$ is a homoleptic complex whereas

$[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is a heteroleptic complex.

Statement II : Complex

$[\text{Co}(\text{NH}_3)_6]^{3+}$ has only one kind of ligands but

$[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ has more than one kind of ligands

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

- (A) Both Statement I and Statement II are true
 (B) Both Statement I and Statement II are false
 (C) Statement I is true but Statement II is false
 (D) Statement I is false but Statement II is true

NEET 2

Correct Option: A

Solution:

$[\text{Co}(\text{NH}_3)_6]^{3+}$ is a homoleptic complex as only one type of ligands

(NH_3) is coordinated with Co^{3+} ion. While

$[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$ is a heteroleptic complex in which

Co^{3+} ion is ligated with more than one type of ligands i.e., NH_3 and Cl^- .

67. Given below are two statements :

Statement I:

Both $[\text{Co}(\text{NH}_3)_6]^{3+}$ and $[\text{CoF}_6]^{3-}$ complexes are octahedral but differ in their magnetic behaviour. Statement

$[\text{Co}(\text{NH}_3)_6]^{3+}$ is diamagnetic whereas $[\text{CoF}_6]^{3-}$ is paramagnetic. In the light of the above statements, choose the correct answer from the options given below:

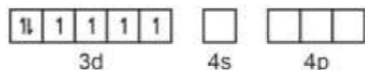
(A) Both Statement I and Statement II are true
 (B) Both Statement I and Statement II are false
 (C) Statement I is true but Statement II is false
 (D) Statement I is false but Statement II is true

NEET 2024

Correct Option: A**Solution:**

In $[\text{Co}(\text{NH}_3)_6]^{3+}$, Co^{3+} ion is having 3 d^6 configuration.

Electronic configuration of Co^{3+}

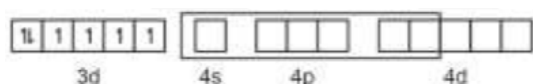


In presence of NH_3 ligand, pairing of electrons takes place and it becomes diamagnetic complex ion

In presence of NH_3 ligand :



$\therefore [\text{Co}(\text{NH}_3)_6]^{3+}$ is octahedral with d^2sp^3 hybridisation and it is diamagnetic in nature. In case of $[\text{CoF}_6]^{3-}$, Co is in +3 oxidation state and it is having 3 d^6 configuration. In presence of weak field F^- ligand, pairing does not take place. In presence of F^- ligands : □



$\therefore$ In $[\text{CoF}_6]^{3-}$, Co^{3+} is $sp^3 d^2$ hybridised with four unpaired electrons, so it is paramagnetic in nature.

68. The reagents with which glucose does not react to give the corresponding tests/products are:

- A. Tollen's reagent
- B. Schiff's reagent
- C. HCN
- D. NH_2OH
- E. NaHSO_3

Choose the correct options from the given below:

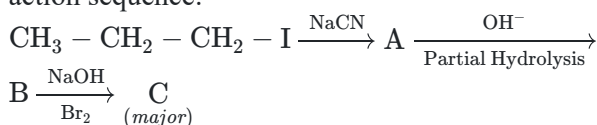
- (A) B and C (B) A and D (C) B and E (D) E and D

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Correct Option: C**Solution:**

Despite having the aldehyde group glucose does not give Schiff test and it does not form the hydrogen sulphate addition product with NaHSO_3 .

69. Identify the major product C formed in the following reaction sequence:



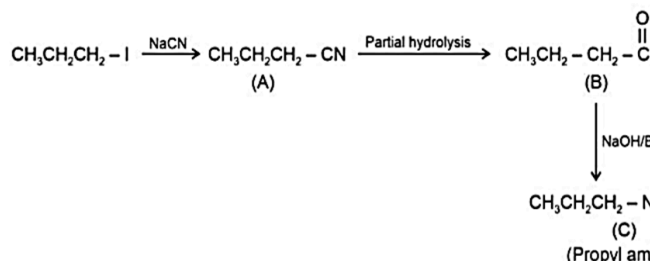
(A) propylamine

(B) butylamine

(C) butanamide

(D) α -bromobutanoic acid

NEET 2

Correct Option: A**Solution:**

- Step-I is S_N reaction with CN nucleophile.

- Step-II will give amide.

- Step-III is Hoffmann bromamide degradation reaction

70. Given below are two statements:

Statement I : Aniline does not undergo Friedel-Crafts alkylation reaction.

Statement II : Aniline cannot be prepared by Gabriel synthesis.

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

- (A) Both statement I and Statement II are true
- (B) Both Statement I and Statement II are false
- (C) Statement I is correct but Statement II is false
- (D) Statement I is incorrect but Statement II is true

NEET 2

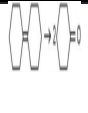
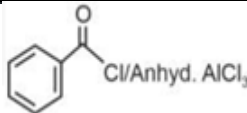
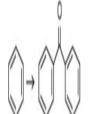
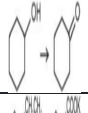
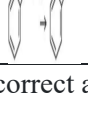
Correct Option: A**Solution:**

- Aniline does not undergo Friedel-Crafts alkylation reaction due to salt formation with aluminium chloride Lewis acid, which is used as a catalyst.

- Aniline (aromatic primary amine) cannot be prepared by Gabriel phthalimide synthesis because aryl halides do not undergo nucleophilic substitution with anion formed by phthalimide.

71. Match List I with List II.

List I (Reaction)	List II (Reagents/Condition)

(A)		(I)	
(B)		(II)	CrO_3
(C)		(III)	$\text{KMnO}_4/\text{KOH}, \Delta$
(D)		(IV)	(i) O_3 (ii) $\text{Zn} - \text{H}_2\text{O}$

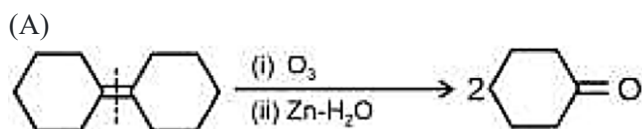
Choose the correct answer from the options given below:

- (A) A-IV, B-I, C-III, D-II (B) A-III, B-I, C-II, D-IV
(C) A-IV, B-I, C-II, D-III (D) A-I, B-IV, C-II, D-III

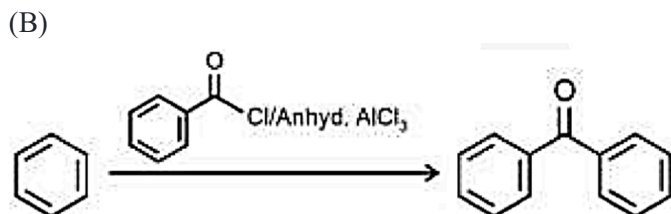
NEET 2024

Correct Option: C

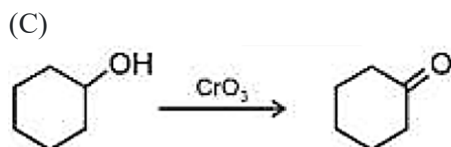
Solution:



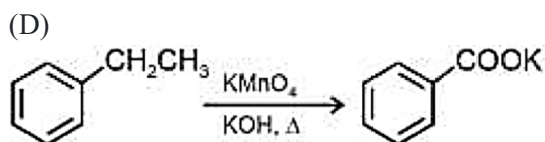
It is reductive ozonolysis



It is Friedel-Crafts acylation reaction.



Secondary alcohols are oxidised to ketones by CrO_3



72. Fehling's solution 'A' is

- (A) aqueous copper sulphate
(B) alkaline copper sulphate
(C) alkaline solution of sodium potassium tartrate (Rochelle's salt)
(D) aqueous sodium citrate

NEET 2

Correct Option: A

Solution:

Fehling solution 'A' = Aqueous copper sulphate

Fehling solution 'B' = Alkaline sodium potassium tartrate (Rochelle salt)

73. Which one of the following alcohols reacts instantaneously with Lucas reagent?

- (A) $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{CH}_2\text{OH}$
(B) $\text{CH}_3 - \text{CH}_2 - \underset{\text{CH}_3}{\text{CH}} - \text{OH}$

- (C) $\text{CH}_3 - \underset{\text{CH}_3}{\text{CH}} - \text{CH}_2\text{OH}$

- (D) $\text{CH}_3 - \underset{\text{CH}_3}{\overset{\text{CH}_3}{\text{C}}} - \text{OH}$

NEET 2

Correct Option: D

Solution:

Tertiary alcohols react instantaneously with Lucas reagent and gives immediate turbidity. In case of tertiary alcohols they form halides easily with Lucas reagent (conc. HCl / ZnCl_2)

74. Given below are two statements:

Statement I: The boiling point of hydrides of Group 16 elements follow the order $\text{H}_2\text{O} > \text{H}_2\text{Te} > \text{H}_2\text{Se} > \text{H}_2\text{S}$

Statement II: On the basis of molecular mass, H_2O is expected to have lower boiling point than the other members of the group but due to the presence of extensive hydrogen bonding in H_2O , it has higher boiling point.

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

- (A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

NEET 2024

Correct Option: A**Solution:**

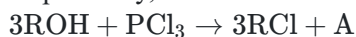
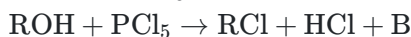
Statement I is correct, because boiling point of hydrides of group 16 follows the order $\text{H}_2\text{O} > \text{H}_2\text{Te} > \text{H}_2\text{Se} > \text{H}_2\text{S}$

Statement II due to intermolecular H-bonding H_2O shows higher boiling point than respective hydrides of group 16.

(Both Statement are true)

Order from H_2Te to H_2S is due to decreasing molar mass.

75. The products A and B obtained in the following reactions, respectively, are:



(A) POCl_3 and H_3PO_3

(B) POCl_3 and H_3PO_4

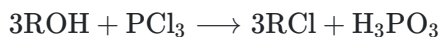
(C) H_3PO_4 and POCl_3

(D) H_3PO_3 and POCl_3

NEET 2024

Correct Option: D**Solution:**

These reactions are preparation of haloalkanes from alcohols.



A and B are H_3PO_3 and POCl_3 respectively.

76. Among Group 16 elements, which one does NOT show -2 oxidation state?

(A) O (B) Se (C) Te (D) Po

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Correct Option: D**Solution:**

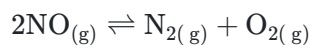
Oxygen shows -2, -1, +1, and +2 oxidation states.

Selenium shows -2, +2, +4, and +6 oxidation states.

Tellurium shows -2, +2, +4, and +6 oxidation states.

Polonium shows +2 and +4 oxidation states only.

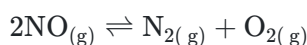
77. Consider the following reaction in a sealed vessel at equilibrium with concentrations of $\text{N}_2 = 3.0 \times 10^{-3}\text{M}$, $4.2 \times 10^{-3}\text{M}$ and $\text{NO} = 2.8 \times 10^{-3}\text{M}$.



If 0.1 mol L^{-1} of $\text{NO}_{(g)}$ is taken in a closed vessel will be degree of dissociation (α) of NO equilibrium?

(A) 0.00889 (B) 0.0889 (C) 0.8889 (D) 0.71

NEET 2

Correct Option: D**Solution:**

$$\begin{aligned} K_c &= \frac{[\text{N}_2][\text{O}_2]}{[\text{NO}]^2} \\ &= \frac{3 \times 10^{-3} \times 4.2 \times 10^{-3}}{2.8 \times 10^{-3} \times 2.8 \times 10^{-3}} \\ &= 1.607 \end{aligned}$$



$$t = 0 \quad 0.1 \quad 0 \quad 0$$

$$0.1 - 0.1\alpha \quad 0.05\alpha \quad 0.05\alpha$$

$$K_c = \frac{0.05\alpha \times 0.05\alpha}{(0.1 - 0.1\alpha)^2}$$

$$K_c = \frac{0.05\alpha \times 0.05\alpha}{0.01(1 - \alpha)^2}$$

$$1.607 = \frac{(0.05)^2 \alpha^2}{0.01(1 - \alpha)^2}$$

$$\frac{\alpha^2}{(1 - \alpha)^2} = \frac{1.607 \times (0.1)^2}{(0.05)^2}$$

$$\frac{\alpha}{1 - \alpha} = \frac{1.27 \times 0.1}{0.05}$$

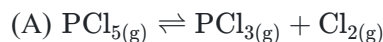
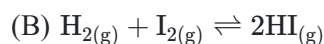
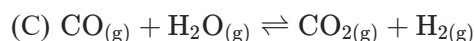
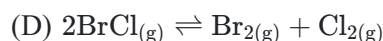
$$\frac{\alpha}{1 - \alpha} = 2.54$$

$$\alpha = 2.54 - 2.54\alpha$$

$$3.54\alpha = 2.54$$

$$\alpha = \frac{2.54}{3.54} = 0.717$$

78. In which of the following equilibria, K_p and K_c are equal?



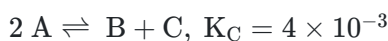
NEET 2024

Correct Option: A**Solution:**

79. For the reaction, $2A \rightleftharpoons B + C$, $K_C = 4 \times 10^{-3}$. At a given time, the composition of reaction mixture is: $[A] = [B] = [C] = 2 \times 10^{-3}M$. Then, which of the following is correct?

- (A) Reaction is at equilibrium.
 (B) Reaction has a tendency to go in forward direction.
 (C) Reaction has a tendency to go in backward direction.
 (D) Reaction has gone to completion in forward direction.

NEET 2024

Correct Option: C**Solution:**

At a given time t , Q_c is to be calculated and been compared with K_c .

$$Q_C = \frac{[B][C]}{[A]^2} = \frac{(2 \times 10^{-3})(2 \times 10^{-3})}{(2 \times 10^{-3})^2}$$

$$Q_C = 1$$

As $Q_c > K_c$, so reaction has a tendency to move backward.

80. The work done during reversible isothermal expansion of one mole of hydrogen gas at $25^\circ C$ from pressure of 20 atmosphere to 10 atmosphere is
 (Given $R = 2.0 \text{ cal K}^{-1} \text{ mol}^{-1}$)

- (A) 0 calorie (B) -413.14 calories
 (C) 413.14 calories (D) 100 calories

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Correct Option: B**Solution:**

$$W_{rev,iso} = -2.303nRT \log \frac{P_i}{P_f}$$

$$= -2.303 \times 1 \times 2 \times 298 \times \log 2$$

$$= -2.303 \times 1 \times 2 \times 298 \times 0.3$$

$$= -413.14 \text{ calories}$$

81. Match List I with List II.

List-I (Process)		List-II (Conditions)	
(A)	Isothermal process	(I)	No heat exchange
(B)	Isochoric process	(II)	Carried out at constant temperature
(C)	Isobaric process	(III)	Carried out at constant volume
(D)	Adiabatic process	(IV)	Carried out at constant pressure

Choose the correct answer from the options given below

- (A) A-IV, B-III, C-II, D-I (B) A-IV, B-II, C-III, D-I
 (C) A-I, B-II, C-III, D-IV (D) A-II, B-III, C-IV, D-I

NEET 2

Correct Option: D**Solution:**

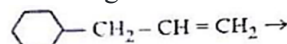
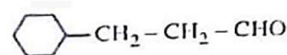
(A) Isothermal process $\Rightarrow$ Temperature is constant throughout the process

(B) Isochoric process $\Rightarrow$ Volume is constant throughout process

(C) Isobaric process $\Rightarrow$ Pressure is constant throughout process

(D) Adiabatic process $\Rightarrow$ No exchange of heat (q) between system and surrounding

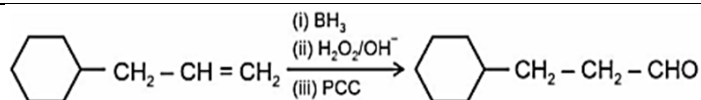
82. Identify the correct reagents that would bring about the following transformation.



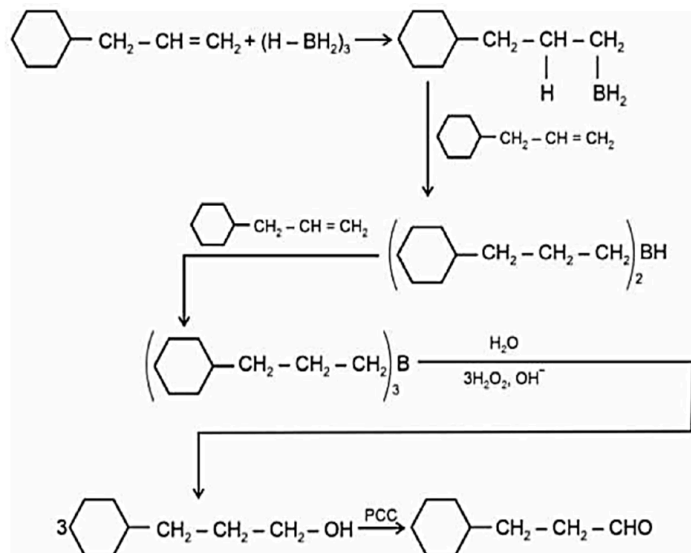
- (A) (i) H_2O/H^+ (ii) CrO_3
 (B) (i) BH_3 (ii) $H_2O_2/\overset{\ominus}{O}H$
 (iii) PCC
 (C) (i) BH_3 (ii) $H_2O_2/\overset{\ominus}{O}H$
 (iii) alk. $KMnO_4$ (iv) H_3O^+
 (D) (i) H_2O/H^+ (ii) PCC

NEET 2

Correct Option: B**Solution:**



Mechanism :



83. A compound X contains 32% of A, 20% of B and remaining percentage of C. Then, the empirical formula of X is :

(Given atomic masses of A = 64; B = 40; C = 32u)

- (A) A₂BC₂ (B) ABC₃
(C) AB₂C₂ (D) ABC₄

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Correct Option: B

Solution:

Element	Mass percentage %	No. of moles	No. of moles/Smallest number	Simplest whole Number
A	32%	$\frac{32}{64} = \frac{1}{2}$	$\frac{1}{2} \times 2$	= 1
B	20%	$\frac{20}{40} = \frac{1}{2}$	$\frac{1}{2} \times 2$	= 1
C	48%	$\frac{48}{32} = \frac{3}{2}$	$\frac{3}{2} \times 2$	= 3

So, empirical formula of X = A : B : C
1 : 1 : 3

∴ The correct empirical formula of compound X is ABC,

84. 1 gram of sodium hydroxide was treated with 25 ml of 0.75 M HCl solution, the mass of sodium hydroxide unreacted is equal to

- (A) 750 mg (B) 250 mg (C) Zero mg (D) 200 mg

NEET 2

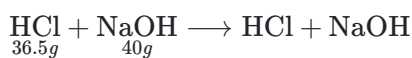
Correct Option: B

Solution:

$$M = \frac{W \times 1000}{M_2 \times V(\text{in mL})}$$

$$W = \frac{M \times M_2 \times V(\text{in mL})}{1000} = \frac{0.75 \times 36.5 \times 25}{1000}$$

$$= 0.684 \text{ g (Mass of HCl)}$$



$$36.5 \text{ g HCl reacts with NaOH} = 40 \text{ g}$$

$$0.684 \text{ g HCl reacts with NaOH} = \frac{40}{36.5} \times 0.684 = 0.750 \text{ g}$$

$$\text{Amount of NaOH left} = 1 \text{ g} - 0.750 \text{ g} = 0.250 \text{ g} = 250 \text{ mg}$$

85. The highest number of helium atoms is in

- (A) 4 mol of helium (B) 4u of helium
(C) 4 g of helium (D) 2.271098 L of helium at STP

NEET 2

Correct Option: A

Solution:

$$(1) 4 \text{ mol of He} = 4 N_A \text{ He atoms}$$

$$(2) 4u \text{ of He} = \frac{4u}{4u} = 1 \text{ He}$$

$$(3) 4 \text{ g of Helium} = \frac{4 \text{ g}}{4 \text{ g}} \text{ mole} = 1 \text{ mole} = N_A \text{ He atoms}$$

$$(4) 2.271098 \text{ L of He at STP} = \frac{2.271}{22.710982} \text{ mole}$$

$$= 0.1 \text{ mole}$$

$$= 0.1 N_A \text{ He atoms}$$

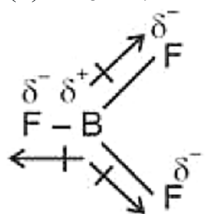
86. Identify the correct answer.

- (A) Three resonance structures can be drawn for ozone
(B) BF₃ has non-zero dipole moment
(C) Dipole moment of NF₃ is greater than that of N₂
(D) Three canonical forms can be drawn for CO₃²⁻

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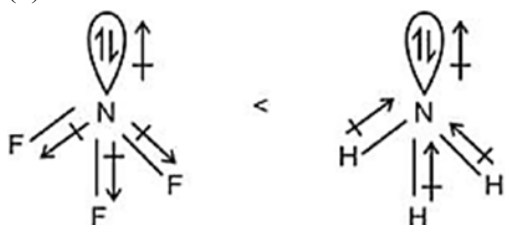
Correct Option: D**Solution:**

(1) In ozone, there are two resonating structures.

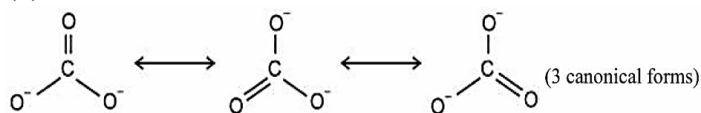
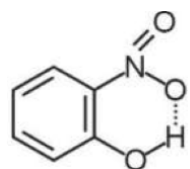
(2) BF_3 i.e.,

; Dipole moment = 0

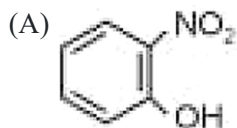
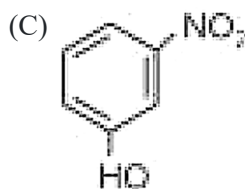
(3)

(0.80 × 10⁻³⁰ Cm) (4.90 × 10⁻³⁰ Cm)

(4)



← H-bonding

87. Intramolecular hydrogen bonding is present in

(D) HF

NEET 2

Correct Option: A**Solution:**

In o-nitrophenol intramolecular H-bonding is present.

88. Match List I with List II.

List I (Compound):		List II (Shape/Geometry):	
(A)	NH_3	(I)	Trigonal Pyramidal
(B)	BrF_5	(II)	Square Planar
(C)	XeF_4	(III)	Octahedral
(D)	SF_6	(IV)	Square Pyramidal

Choose the correct answer from the options given below

(A) A-I, B-IV, C-II, D-III (B) A-II, B-IV, C-III, D-I

(C) A-III, B-IV, C-I, D-II (D) A-II, B-III, C-IV, D-I

NEET 2

Correct Option: A**Solution:** $\text{NH}_3 \rightarrow sp^3$ hybridised with 1 lone pair. Structure will be Trigonal Pyramidal. $\text{BrF}_5 \rightarrow sp^3 d^2$ hybridised with 1 lone pair. Structure will be Square Pyramidal. $\text{XeF}_4 \rightarrow sp^3 d^2$ with two lone pairs. Structure will be Square Planar. $\text{SF}_6 \rightarrow sp^3 d^2$ with no lone pair. Structure will be Octahedral.

A – I, B – IV, C – II, D – III

89. Match List I with List II.

List I (Molecule)		List II (Number and types of bond/s between two carbon atoms)	
(A)	ethane	(I)	one σ -bond and two π bonds
(B)	Ethene	(II)	two π bonds
(C)	carbon molecule, C_2	(III)	one σ -bond

(D)	ethyne	(IV)	one σ -bond and one π -bond
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Choose the correct answer from the options given below:

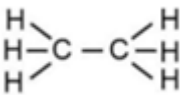
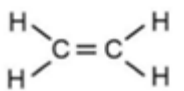
(A) A – I, B – IV, C – II, D – III (B) A – IV, B – III, C – II, D – I (A) Si < C < N < O < F

(C) A – III, B – IV, C – II, D – I (D) A – III, B – IV, C – I, D – II (B) Si < C < O < N < F

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Correct Option: C

Solution:

(A)	ethane 	one (C – C) σ bond
(B)	Ethene 	one (C – C) σ and one (C – C) π bond
(C)	C ₂	two (C – C) π bonds
(D)	Ethyne H – C $\equiv$ C – C	two (C – C) π bonds and one (C – C) σ bond

90. Arrange the following elements in increasing order of first ionization enthalpy: Li, Be, B, C, N.

Choose the correct answer from the options given below:

(A) Li < Be < B < C < N

(B) Li < B < Be < C < N

(C) Li < Be < C < B < N

(D) Li > Be < C > B < N

NEET 2024

Correct Option: B

Solution:

Increasing order of first ionization enthalpy is Li < B < Be < C < N

Element	First ionization enthalpy ($\Delta_i H / \text{kJ mol}^{-1}$)
Li	520
Be	899
B	801
C	1086
N	1402

91. Arrange the following elements in increasing order of electronegativity:

N, O, F, C, Si

Choose the correct answer from the options given below:

(A) Si < C < N < O < F

(B) Si < C < O < N < F

(C) O < F < N < C < Si

(D) F < O < N < C < Si

NEET 2

Correct Option: A

Solution:

Electronegativity increases across the period on moving left to right. It decreases on moving down the group.

The correct option is Si < C < N < O < F

92. Match List I with List II

List I (Quantum Number)		List II (Information provided)	
A.	m_ℓ	I.	Shape of orbital
B.	m_s	II.	Size of orbital
C.	ℓ	III.	Orientation of orbital
D.	n	IV.	Orientation of spin of electron

Choose the correct answer from the options given below:

(A) A – III, B – IV, C – I, D – II (B) A – I, B – III, C – II, D – IV

(C) A – III, B – IV, C – II, D – I (D) A – II, B – I, C – III, D – IV

NEET 2

Correct Option: A

Solution:

- Magnetic quantum number m_ℓ informs about orientation of orbital.

- Spin quantum number m_s informs about orientation of spin of electron.

- Azimuthal quantum number (ℓ) informs about shape of orbital

- Principal quantum number (n) informs about size of orbital

93. The energy of an electron in the ground state ($n = 1$) for He^+ ion is $-x$ J, then that for an electron in $n = 2$ state for Be^{3+} ion in J is

- (A) $-x$ (B) $-\frac{x}{9}$
(C) $-4x$ (D) $-\frac{4}{9}x$

NEET 2024

Correct Option: A**Solution:**

$$E_n = -R_H \left(\frac{Z^2}{n^2} \right) J$$

For He^+ ($n = 1$),

$$E_n = -x = -R_H \left(\frac{2^2}{1^2} \right) = -4R_H$$

$$\therefore R_H = \frac{x}{4}$$

For Be^{3+} ($n = 2$),

$$E_n = -R_H \left(\frac{Z^2}{n^2} \right) J$$

$$= -\frac{x}{4} \times \left(\frac{4 \times 4}{2 \times 2} \right) = -x \text{ J}$$

94. Given below are two statements :

Statement I: The boiling point of three isomeric pentanes follows the order n -pentane $>$ isopentane $>$ neopentane.

Statement II: When branching increases, the molecule attains a shape of sphere. This results in smaller surface area for contact, due to which the intermolecular forces between the spherical molecules are weak, thereby lowering the boiling point.

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

- (A) Both Statement I and Statement II are correct
(B) Both Statement I and Statement II are incorrect
(C) Statement I is correct but Statement II is incorrect
(D) Statement I is incorrect but Statement II is correct

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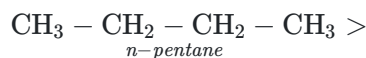
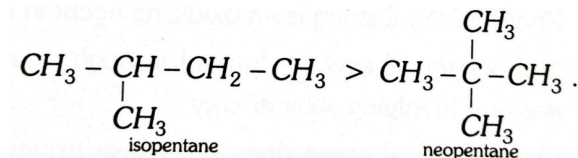
Correct Option: A**Solution:**

For alkanes

Boiling point $\propto$ molecular mass

$$\propto \frac{1}{\text{Branching}} (\text{if molecular mass is same})$$

Boiling point



95. Given below are certain cations. Using inorganic qualitative analysis, arrange them in increasing group number from 0 to VI.

- A. Al^{3+}
B. Cu^{2+}
C. Ba^{2+}
D. Co^{2+}
E. Mg^{2+}

Choose the correct answer from the options given below

- (A) B, A, D, C, E
(B) B, C, A, D, E
(C) E, C, D, B, A
(D) E, A, B, C, D

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Correct Option: A**Solution:**

	Basic Radicals	Group Number
B.	Cu^{+2}	II
A.	Al^{+3}	III
D.	Co^{+2}	IV
C.	Ba^{+2}	V
E.	Mg^{+2}	VI

B, A, D, C, E.

96. Match List I with List II

	List I (Conversion)		List II (Number of Faraday required)
(A)	1 mol of H_2O to O_2	(I)	3F
(B)	1 mol of MnO_4^- to Mn^{2+}	(II)	2F
(C)	1.5 mol of Ca from molten CaCl_2	(III)	1F

(D)	1 mol of FeO to Fe ₂ O ₃	(IV)	5F
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Choose the correct answer from the options given below

(A) A-II, B-IV, C-I, D-III (B) A-III, B-IV, C-I, D-II

(C) A-II, B-III, C-I, D-IV (D) A-III, B-IV, C-II, D-I

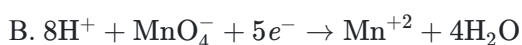
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Correct Option: A

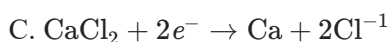
Solution:



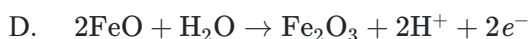
1 mol H₂O will req. 2 F charge



1 mole MnO₄⁻ will req. 5F charge

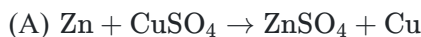
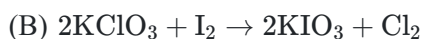


1.5 mole Ca will req. 3F charge



1 mole FeO will req. 1F charge

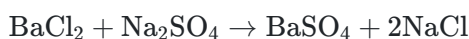
97. Which reaction is not a redox reaction?



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Correct Option: D

Solution:



98. During the preparation of Mohr's salt solution (Ferrous ammonium sulphate), which of the following acid is added to prevent hydrolysis of Fe⁺² ion?

(A) dilute nitric acid (B) dilute sulphuric acid

(C) dilute hydrochloric acid (D) concentrated sulphuric acid

NEET 2024

Correct Option: B

Solution:

Addition of H₂SO₄ prevent hydrolysis of Fe⁺² but, dil solution is used. If concentrated H₂SO₄ be used it can oxidise Fe⁺² into Fe⁺³.

99. The Henry's law constant (k_H) values of three gases B, C) in water are 145, 2×10^{-5} and 35 kbar, respectively. The solubility of these gases in water follow order:

(A) B > A > C

(B) B > C > A

(C) A > C > B

(D) A > B > C

NEET 2

Correct Option: B

Solution:

According to Henry's law: $P = K_H x$ Thus, a lower val of K_H indicates higher value of x (mole fraction/ concentration) for a given pressure and therefore high solubility. Since, K_H : B < C < A; Solubility; B > C > A.

100. 'Spin only' magnetic moment is same for which following ions?

A. Ti³⁺ B. Cr²⁺

C. Mn²⁺ D. Fe²⁺

E. Sc³⁺

Choose the most appropriate answer from the o given below.

(A) B and D only

(B) A and E only

(C) B and C only

(D) A and D only

NEET 2

Correct Option: A

Solution:

Ions No. of unpaired electrons Configuration

Ti³⁺ 1 3 d¹

Cr²⁺ 4 3 d⁴

Mn²⁺ 5 3 d⁵

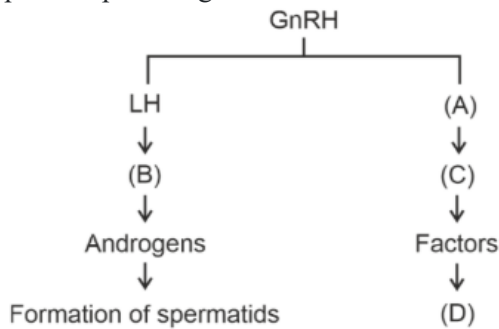
Fe²⁺ 4 3 d⁶

Sc³⁺ 0 3 d⁰

Spin only magnetic moment is given by $\sqrt{n(n+2)}\text{BM}$

∴ Cr²⁺ and Fe²⁺ will have same spin only magnetic moment.

101. Identify the correct option (A), (B), (C), (D) with respect to spermatogenesis.



(A) FSH, Leydig cells, Sertoli cells, spermiogenesis.

(B) ICSH, Interstitial cells, Leydig cells, spermiogenesis.

(C) FSH, Sertoli cells, Leydig cells, spermatogenesis.

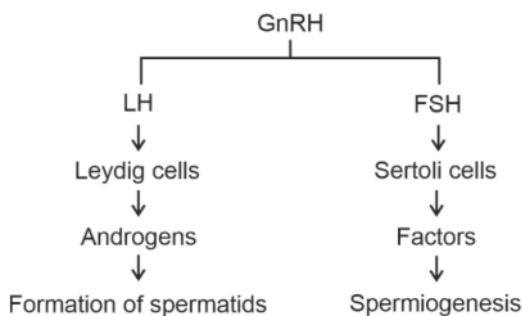
(D) ICSH, Leydig cells, Sertoli cells, spermatogenesis.

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Correct Option: A

Solution:

The correct answer is option no. (1) as



(A) is *FSH* which is a pituitary hormone.

(B) is Leydig cells which are found in the interstitial space outside of the seminiferous tubules.

(C) is Sertoli cells are found inside the seminiferous tubules.

(D) is Spermiogenesis which is a process that helps in transformation of spermatids into spermatozoa.

102. Match List I with List II related to digestive system of cockroach.

	List I		List II
A.	The structures used for storing of food	I.	Gizzard

B.	Ring of 6-8 blind tubules at junction of foregut and midgut.	II.	Gastric Caec
C.	Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut.	III.	Malpighian tubules
D.	The structures used for grinding the food.	IV.	Crop

Choose the correct answer from the options below:

(A) A-IV, B-II, C-III, D-I (B) A-I, B-II, C-III, D-IV

(C) A-IV, B-III, C-II, D-I (D) A-III, B-II, C-IV

NEET 2

Correct Option: A

Solution:

The correct answer is option no. (1) as

The structure used for grinding the food particles	-	Gizzard
The structure used for storing of food	-	Crop
Ring of 6-8 blind tubules at junction of foregut and midgut which assists in secretion of digestive juices	-	Gastric Caeca
Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut which assists in elimination of nitrogenous wastes	-	Malpighian tubules

103. In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on

(A) 5th segment

(B) 10th segment

(C) 8th and 9th segment

(D) 11th segment

NEET 2

Correct Option: B

Solution:

Correct answer is option (2), because in both sexes of cockroach, 10th segment bears a pair of jointed filamentous structures called anal cerci.

Options (1), (3) and (4) are incorrect because 5th, 8th and 9th segments do not bear such structures. In adult cockroaches only 10th segments are present in abdomen. 11th abdominal segment is absent.

104. Which of the following are Autoimmune disorders?
A. Myasthenia gravis B. Rheumatoid arthritis C. Gout D. Muscular dystrophy E. Systemic Lupus Erythematosus (SLE)

Choose the most appropriate answer from the options given below:

- (A) A, B & D only (B) A, B & E only
(C) B, C & E only (D) C, D & E only

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Correct Option: B

Solution:

The correct answer is option (2) as Myasthenia gravis, Rheumatoid arthritis and Systemic Lupus

Erythematosus (SLE) are autoimmune disorders.

Muscular dystrophy is a genetic disorder which progressively affects the skeletal muscles.

Gout is the inflammation of joints due to deposition of uric acid crystals.

Option (1), (3) and (4) are not the correct answer because all of them are not autoimmune disorders.

105. Match List I with List II :

List I	List II
A. Pterophyllum	I. Hag fish
B. Myxine	II. Saw fish
C. Pristis	III. Angel fish
D. Exocoetus	IV. Flying fish

Choose the correct answer from the options given below :

- (A) A-II, B-I, C-III, D-IV (B) A-III, B-I, C-II, D-IV
(C) A-IV, B-I, C-II, D-III (D) A-III, B-II, C-I, D-IV

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Correct Option: B

Solution:

The correct option is option no. (2) as

Pterophyllum is the scientific name for Angel fish.

Myxine is the scientific name for Hag fish.

Pristis is the scientific name for Saw fish.

Exocoetus is the scientific name for Flying fish.

106. Match List I with List II

	List I		List II
A.	Non-mediated IUD	I.	Multiload 375
B.	Copper releasing IUD	II.	Progestogens
C.	Hormone releasing IUD	III.	Lippes loop
D.	Implants	IV.	LNG-20

Choose the correct answer from the option given b

- (A) A-III, B-I, C-II, D-IV (B) A-I, B-III, C-IV, I
(C) A-IV, B-I, C-II, D-III (D) A-III, B-I, C-IV, I

NEET 2

Correct Option: D

Solution:

Correct answer is option (4) because

- Lippes loop is a non-medicated IUD.

- Multiload 375 is a copper releasing IUD.

- LNG-20 is a hormone releasing IUD.

- Progestogens are used as implants.

107. Match List I with List II :

	List I		List II
A.	Typhoid	I.	Fungus
B.	Leishmaniasis	II.	Nematode
C.	Ringworm	III.	Protozoa
D.	Filariasis	IV.	Bacteria

Choose the correct answer from the options below:

- (A) A-I, B-III, C-II, D-IV (B) A-IV, B-III, C-I, I
(C) A-III, B-I, C-IV, D-II (D) A-II, B-IV, C-III,

NEET 2

Correct Option: B

Solution:

The correct answer is option (2) as

Typhoid - Caused by *Salmonella typhimurium* (Bacteria)

Leishmaniasis - Caused by protozoan i.e., *Leishmania donovani*

Ringworm - Caused by fungi belonging to the genera *Microsporum*, *Trichophyton* and *Epidermophyton*

Filariasis - Caused by *Wuchereria bancrofti* and *Wuchereria malayi* (Nematode)

- 108.** Given below are two statements : one is labelled as Assertion *A* and the other is labelled as Reason *R* :
 Assertion *A* : FSH acts upon ovarian follicles in female and Leydig cells in male.
 Reason *R* : Growing ovarian follicles secrete estrogen in female while interstitial cells secrete androgen in male human being.
 In the light of the above statements, choose the correct answer from the options given below:

- (A) Both *A* and *R* are true and *R* is the correct explanation of *A*
 (B) Both *A* and *R* are true but *R* is NOT the correct explanation of *A*
 (C) *A* is true but *R* is false
 (D) *A* is false but *R* is true

NEET 2024

Correct Option: D

Solution:

The correct answer is option (4) as FSH is a gonadotropin affects ovarian follicles in females and causes their growth but in males LH affects Leydig cells leading to secretion of androgens.

Growing ovarian follicles secrete estrogen in females while interstitial cells secrete androgen in male human being.

Hence, Assertion is false and Reason is true.

- 109.** Which of the following statements is incorrect?

- (A) A bio-reactor provides optimal growth conditions for achieving the desired product
 (B) Most commonly used bio-reactors are of stirred type
 (C) Bio-reactors are used to produce small scale bacterial cultures
 (D) Bio-reactors have an agitator system, an oxygen delivery system and foam control system

NEET 2

Correct Option: C

Solution:

Correct answer is option (3)

The statement (3) is incorrect because bioreactors are used for processing of large volumes (1001000 litres) of cultures.

Small volume cultures cannot yield appreciable quantities of products. To produce in large quantities the development of bioreactors is required.

- 110.** Match List I with List II

	List-I (Types of Stamens)		List-II (Examples)
A.	Monoadelphous	I.	Citrus
B.	Diadelphous	II.	Pea
C.	Polyadelphous	III.	Lily
D.	Epiphyllous	IV.	China-rose

Choose the correct answer from the options given below:

- (A) A-IV, B-II, C-I, D-III (B) A-IV, B-I, C-II, D-III
 (C) A-I, B-II, C-IV, D-III (D) A-III, B-I, C-IV, D-II

NEET 2

Correct Option: A

Solution:

In China rose monoadelphous androecium is present.

Diadelphous androecium is found in pea plant.

Polyadelphous androecium is found in citrus.

Epiphyllous androecium is found in lily.

- 111.** Which one of the following can be explained on the basis of Mendel's Law of Dominance?

A. Out of one pair of factors one is dominant and the other is recessive.
 B. Alleles do not show any expression and both the characters appear as such in F_2 generation.
 C. Factors occur in pairs in normal diploid plants.
 D. The discrete unit controlling a particular character is called factor.
 E. The expression of only one of the parental characters is found in a monohybrid cross.
 Choose the correct answer from the options given below:

- (A) A, B and C only
 (B) A, C, D and E only
 (C) B, C and D only
 (D) A, B, C, D and E

NEET 2024**Correct Option: B****Solution:**

According to Law of Dominance

- (1) Characters are controlled by discrete units called factors
 (2) Factors occur in pairs
 (3) In a dissimilar pair of factors one member of the pair dominates (dominant) the other recessive

The law of dominance is used to explain the expression of only one of the parental characters in a monohybrid cross.

Law of segregation is based on the fact that the alleles do not show any expression and both the characters are recovered as such in F_2 generation

- 112.** Tropical regions show greatest level of species richness because
 A. Tropical latitudes have remained relatively undisturbed for millions of years, hence more time was available for species diversification.
 B. Tropical environments are more seasonal.
 C. More solar energy is available in tropics.
 D. Constant environments promote niche specialization.
 E. Tropical environments are constant and predictable.
 Choose the correct answer from the options given below.
 (A) A,C,D and E only (B) A and B only
 (C) A,B, and E only (D) A,B, and D only

NEET 2**Correct Option: A****Solution:**

Only statement B is incorrect because tropical environments unlike temperate ones, are less seasonal, relatively more constant and predictable.

Thus statements A, C, D and E are correct.

- 113.** Hind II always cuts DNA molecules at a particular called recognition sequence and it consists of:
 (A) 8 bp (B) 6 bp (C) 4 bp (D) 10 bp

NEET 2**Correct Option: B****Solution:**

The correct answer is option (2).

The first restriction endonuclease - Hind II, whose functioning depends on a specific DNA nucleotide sequence was isolated. It was found that Hind II always cuts DNA molecules at a particular point by recognising sequence of six base pairs.

Option (1), (3) and (4) are incorrect because they have either more than 6 or less than 6 bp .

- 114.** The capacity to generate a whole plant from any cell of the plant is called:
 (A) Totipotency (B) Micropropagation
 (C) Differentiation (D) Somatic hybridization

NEET 2**Correct Option: A****Solution:**

Totipotency is defined as the capacity to generate a whole plant from any cell of the plant.

- 115.** Which one of the following factors will not affect Hardy-Weinberg equilibrium?
 (A) Genetic recombination (B) Genetic drift
 (C) Gene migration (D) Constant gene pool

NEET 2**Correct Option: D**

**Solution:****Answer: (D) Constant gene pool**

Hardy-Weinberg equilibrium is disturbed by factors like:

- Genetic drift
- Gene migration
- Genetic recombination

A **constant gene pool** helps maintain the equilibrium, so it does **not** affect it.

116. The flippers of the Penguins and Dolphins are the example of the

- (A) Adaptive radiation (B) Natural selection
(C) Convergent evolution (D) Divergent evolution

NEET 2024**Correct Option: C****Solution:****Answer: (C) Convergent evolution**

Penguins and dolphins belong to different groups but both developed flippers for swimming. This is an example of **convergent evolution** (analogous organs)

117. Which of the following is not a natural/traditional contraceptive method?

- (A) Coitus interruptus (B) Periodic abstinence
(C) Lactational amenorrhea (D) Vaults

NEET 2024**Correct Option: D****Solution:**

118. Which of the following is not a component of Fallopian tube?

- (A) Uterine fundus (B) Isthmus
(C) Infundibulum (D) Ampulla

NEET 2024**Correct Option: A****Solution:**

The **uterine fundus** is a part of the uterus, not the Fallopian tube.

119. Given below are two statements:

Statement I:

The presence or absence of hymen is not a reliable indicator of virginity.

Statement II:

The hymen is torn during the first coitus only. In light of the above statements, choose the correct answer from the options given below :

- (A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

NEET 2**Correct Option: C****Solution:**

120. Consider the following statements:

- A. Annelids are true coelomates
B. Poriferans are pseudocoelomates
C. Aschelminthes are acoelomates
D. Platyhelminthes are pseudocoelomates

Choose the correct answer from the options below:

- (A) B only (B) A only (C) C only (D) D only

NEET 2**Correct Option: B****Solution:**

A. Annelids are true coelomates (Correct): Annelids possess a true body cavity (coelom) that is completely lined by mesodermal tissue.

B. Poriferans are pseudocoelomates (Incorrect):

Poriferans (sponges) are structurally simple and completely **lack a body cavity** (they are acoelomates at cellular level of organization).

C. Aschelminthes are acoelomates (Incorrect):

Aschelminthes (roundworms) are actually **pseudocoelomates**, meaning their body cavity is present but scattered in pouches rather than completely lined by mesoderm.

D. Platyhelminthes are pseudocoelomates (Incorrect):

Platyhelminthes (flatworms) are **acoelomates**, meaning they have no body cavity between the gut and the outer body wall.

121. Match List I with List II:

List I		List II	
(A)	Pleurobrachia	(I)	Mollusca
(B)	Radula	(II)	Ctenophora
(C)	Stomochord	(III)	Osteichthyes
(D)	Air bladder	(IV)	Hemichordata

Choose the correct answer from the options given below:

- (A) A – IV, B – II, C – III, D – I
 (B) A – II, B – I, C – IV, D – III
 (C) A – II, B – IV, C – I, D – III
 (D) A – IV, B – III, C – II, D – I

NEET 2024**Correct Option: B****Solution:****(A) Pleurobrachia → (II) Ctenophora**

(Pleurobrachia, commonly known as a comb jelly, belongs to the Phylum Ctenophora).

(B) Radula → (I) Mollusca

(The radula is a file-like rasping organ used for feeding, uniquely found in the mouth of molluscs).

(C) Stomochord → (IV) Hemichordata

(Hemichordates possess a rudimentary, rod-like structure in their collar region called a stomochord).

(D) Air bladder → (III) Osteichthyes

(Bony fishes belong to Osteichthyes and possess a gas-filled air bladder that regulates their buoyancy).

122. Match List I with List II:

List I		List II	
A	Unicellular glandular epithelium	I	Salivary glands
B	Compound epithelium	II	Pancreas

C	Multicellular glandular epithelium	III	Goblet cells of alimentary canal
D	Endocrine glandular epithelium	IV	Moist surface of buccal cavity

Choose the correct answer from the options below:

- (A) A-II, B-I, C-III, D-IV (B) A-IV, B-III, C-I, D-III
 (C) A-III, B-IV, C-I, D-II (D) A-II, B-I, C-IV, D-III

NEET 2**Correct Option: C****Solution:**

The correct matching is:

- **A. Unicellular glandular epithelium → III. Goblet cells of alimentary canal**
- **B. Compound epithelium → IV. Moist surface buccal cavity**
- **C. Multicellular glandular epithelium → I. Salivary glands**
- **D. Endocrine glandular epithelium → II. Pancreas**

So, the correct answer is:

A-III, B-IV, C-I, D-II**123. Which of the following is not a steroid hormone?**

- (A) Cortisol (B) Testosterone
 (C) Progesterone (D) Glucagon

NEET 2**Correct Option: D****Solution:****124. Match List I with List II :**

List I		List II	
(A)	Cocaine	(I)	Effective sedative in surge
(B)	Heroin	(II)	Cannabis sativa
(C)	Morphine	(III)	Erythroxylum
(D)	Marijuana	(IV)	Papaver somniferum



Choose the correct answer from the options given below:

- (A) A-III, B-IV, C-I, D-II (B) A-IV, B-III, C-I, D-II
(C) A-I, B-III, C-II, D-IV (D) A-II, B-I, C-III, D-IV

NEET 2024

Correct Option: A

Solution:

125. Given below are two statements:

Statement I: The cerebral hemispheres are connected by nerve tract known as corpus callosum.

Statement II: The brain stem consists of the medulla oblongata, pons and cerebrum.

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

- (A) Both Statement I and Statement II are correct.
(B) Both Statement I and Statement II are incorrect.
(C) Statement I is correct but Statement II is incorrect.
(D) Statement I is incorrect but Statement II is correct.

NEET 2024

Correct Option: C

Solution:

126. List I	List II
A. Pons	I. Provides additional space for Neurons, regulates posture and balance.
B. Hypothalamus	II. Controls respiration and gastric secretions.
C. Medulla	III. Connects different regions of the brain.
D. Cerebellum	IV. Neuro secretory cells

Choose the correct answer from the options given below:

- (A) A-III, B-IV, C-II, D-I (B) A-II, B-III, C-I, D-IV
(C) A-I, B-III, C-II, D-IV (D) A-III, B-I, C-III, D-IV

NEET 2024

Correct Option: A

Solution:

127. Match List I with List II:

	List I		List II
A.	Expiratory capacity	I.	Expiratory reserve volume + Tidal volume
B.	Functional residual capacity	II.	Tidal volume + Expiratory reserve volume
C.	Vital capacity	III.	Tidal volume + Inspiratory reserve volume
D.	Inspiratory capacity	IV.	Expiratory reserve volume + Residual volume

Choose the correct answer from the options below:

- (A) A-II, B-IV, C-I, D-III (B) A-III, B-II, C-IV,
(C) A-II, B-I, C-IV, D-III (D) A-I, B-III, C-II, I

NEET 2

Correct Option: A

Solution:

128. List of endangered species was released by

- (A) GEAC (B) WWF (C) FOAM (D) IUCN

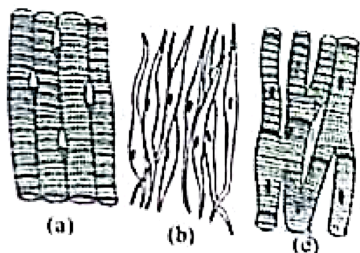
NEET 2

Correct Option: D

Solution:

List of endangered species was released by - IUCN.

129. Three types of muscles are given as *a*, *b* and *c*. Identify the correct matching pair along with their location in human body:



Name of muscle/location:

- (A) (a) Smooth - Toes (b) Skeletal - Legs (c) Cardiac - Heart
- (B) (a) Skeletal - Triceps (b) Smooth - Stomach (c) Cardiac - Heart
- (C) (a) Skeletal - Biceps (b) Involuntary - Intestine (c) Smooth - Heart
- (D) (a) Involuntary - Nose tip (b) Skeletal - Bone (c) Cardiac - Heart

NEET 2024

Correct Option: B

Solution:

130. The equation of Verhulst-Pearl logistic growth is $\frac{dN}{dt} = rN \left[\frac{K-N}{K} \right]$.

From this equation, K indicates:

- (A) Intrinsic rate of natural increase
- (B) Biotic potential
- (C) Carrying capacity
- (D) Population density

NEET 2024

Correct Option: C

Solution:

In the equation $\frac{dN}{dt} = rN \left(\frac{K-N}{K} \right)$, K represents carrying capacity.

131. In an ecosystem if the Net Primary Productivity (NPP) of first trophic level is $100 \times (\text{kcal m}^{-2}) \text{ yr}^{-1}$, what would be the GPP (Gross Primary Productivity) of the third trophic level of the same ecosystem?

- (A) $\frac{x}{10} (\text{kcal m}^{-2}) \text{ yr}^{-1}$
- (B) $x (\text{kcal m}^{-2}) \text{ yr}^{-1}$
- (C) $10x (\text{kcal m}^{-2}) \text{ yr}^{-1}$
- (D) $\frac{100x}{3x} (\text{kcal m}^{-2}) \text{ yr}^{-1}$

NEET 2

Correct Option: C

Solution:

NPP at first trophic level would be the GPP for second trophic level. NPP at second trophic level would be GPP for third trophic level. Therefore, $100x (\text{kcal/m}^2/\text{yr})$ would be GPP at second trophic level and $100x \times 10\% (\text{kcal/m}^2/\text{yr})$ i.e., $10x (\text{kcal/m}^2/\text{yr})$ energy would be GPP at third trophic level.

132. Given below are two statements :

Statement I: In the nephron, the descending limb of Henle is impermeable to water and permeable to electrolytes.

Statement II: The proximal convoluted tubule is lined by simple columnar brush border epithelium which increases the surface area for reabsorption.

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

- (A) Both Statement I and Statement II are true
- (B) Both Statement I and Statement II are false
- (C) Statement I is true but Statement II is false
- (D) Statement I is false but Statement II is true

NEET 2

Correct Option: B

Solution:

133. Match the following lists:

List I		List II	
(A)	Frederick Griffith	(I)	Genetic code
(B)	Francois Jacob & Jacques Monod	(II)	Semi-conservative mode of DNA replication
(C)	Har Gobind Khorana	(III)	Transformation
(D)	Meselson & Stahl	(IV)	Lac operon

Choose the correct answer from the options given below:

- (A) A – III, B – II, C – I, D – IV
- (B) A – IV, B – III, C – I, D – II
- (C) A – II, B – III, C – IV, D – I
- (D) A – I, B – IV, C – III, D – II

NEET 2

Correct Option: B

Solution:

Frederick Griffith series of experiment witness miraculous transformation in the bacteria.

The elucidation of Lac operon was a result of a close association between geneticist, Francois Jacob and a biochemist, Jacques Monod.

Meselson and Stahl gave semi-conservative mode of DNA replication.

Har Gobind Khorana developed chemical method to define combination of bases in genetic code.

134. As per ABO blood grouping system, the blood group of father is B^+ , mother is A^+ and child is O^+ . Their respective genotype can be

- A. $I^B i / I^A i / ii$
- B. $I^B I^B / I^A I^A / ii$
- C. $I^A I^B / II^A / I^B i$
- D. $I^A i / I^B i / I^A i$
- E. $ii^B / ii^A / I^A I^B$

Choose the most appropriate answer from the options given below:

- (A) A only
- (B) B only
- (C) C & B only
- (D) D & E only

NEET 2024

Correct Option: A

Solution:

Genotype of father with blood group $B^+ = I^B i / II^B$

Genotype of mother with blood group $A^+ = I^A i / ii^A$

Genotype of child with blood group $O^+ = ii$

Hence only 'A' is correct.

135. Match List I with List II:

List I		List II	
A.	Two or more alternative forms of a gene	I.	Back cross

B.	Cross of F_1 progeny with homozygous recessive parent	II.	Ploidy
C.	Cross of F_1 progeny with any of the parents	III.	Allele
D.	Number of chromosome sets in plant	IV.	Test cross

Choose the correct answer from the options below:

- (A) A – I, B – II, C – III, D – IV
- (B) A – II, B – I, C – III, D – IV
- (C) A – III, B – IV, C – I, D – II
- (D) A – IV, B – III, C – II, D – I

NEET 2

Correct Option: C

Solution:

- A. Two or more alternative forms of gene are called alleles.
- B. Cross of F_1 progeny with homozygous recessive parent is a test cross.
- C. Cross of F_1 progeny with any of the parents is a back cross.
- D. Number of chromosome sets in plant is called ploidy.

136. Identify the set of correct statements:

- A. The flowers of Vallisneria are colourful and produce nectar.
- B. The flowers of water lily are not pollinated by water.
- C. In most of water-pollinated species, the pollen grains are protected from wetting.
- D. Pollen grains of some hydrophytes are long and boat-like.
- E. In some hydrophytes, the pollen grains are released passively inside water.

Choose the correct answer from the options below.

- (A) C, D and E only
- (B) A, B, C and D only
- (C) A, C, D and E only
- (D) B, C, D and E only

NEET 2

Correct Option: D

Solution:

Flowers of *Vallisneria* are not colourful and do not produce nectar. Waterlily is pollinated by insect or wind. In water-pollinated species, pollen grains are protected from wetting by a mucilaginous covering. In some hydrophytes such as *Vallisneria* pollen grains are carried passively by water current.

137. Spraying sugarcane crop with which of the following plant growth regulators increases the length of stem, thus increasing the yield?

- (A) Auxin (B) Gibberellin
(C) Cytokinin (D) Absciscic acid

NEET 2024

Correct Option: B

Solution:

Sugarcanes store carbohydrate as sugar in their stems. Spraying sugarcane crop with gibberellins increases the length of the stem, thus increasing the yield.

138. Auxin is used by gardeners to prepare weedfree lawns. But no damage is caused to grass as auxin

(A) promotes apical dominance.
(B) promotes abscission of mature leaves only.
(C) does not affect mature monocotyledonous plants.
(D) can help in cell division in grasses, to produce growth.

NEET 2024

Correct Option: C

Solution:

Auxin does not affect mature monocot plants. In monocots, especially grasses show limited translocation and cause rapid degradation of external auxin.

139. How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle?

- (A) 2 molecules of ATP and 3 molecules of NADPH
(B) 2 molecules of ATP and 2 molecules of NADPH
(C) 3 molecules of ATP and 3 molecules of NADPH
(D) 3 molecules of ATP and 2 molecules of NADPH

NEET 2

Correct Option: D

Solution:

For fixation of 1 molecule of CO_2 in Calvin cycle 3 ATP molecules and 2 NADPH molecules are required.

140. Bulliform cells are responsible for

- (A) Inward curling of leaves in monocots.
(B) Protecting the plant from salt stress.
(C) Increased photosynthesis in monocots.
(D) Providing large spaces for storage of sugars.

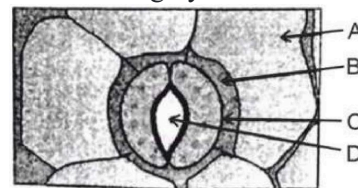
NEET 2

Correct Option: A

Solution:

In grasses, certain adaxial epidermal cells along the vein modify themselves into large, empty, colourless cells. These are called bulliform cells. When the bulliform cells in the leaves have absorbed water and are turgid, the leaf surface is exposed. When they are flaccid due to water stress, they make the leaves curl inwards to minimise water loss.

141. In the given figure, which component has thin walls and highly thickened inner walls?



- (A) C (B) D (C) A (D) B

NEET 2

Correct Option: A

Solution:

Guard cells of stomata have thin outer wall and highly thickened inner walls.

142. Formation of interfascicular cambium from fully developed parenchyma cells is an example for

- (A) Differentiation (B) Redifferentiation
(C) Dedifferentiation (D) Maturation

NEET 2

Correct Option: C

Solution:

The phenomenon of formation of interfascicular cambium from fully differentiated parenchyma cells is called dedifferentiation.

143. Given below are two statements:

Statement I : Parenchyma is living but collenchyma is dead tissue.

Statement II: Gymnosperms lack xylem vessels but presence of xylem vessels is the characteristic of angiosperms.

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

- (A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

NEET 2024

Correct Option: D

Solution:

Collenchyma is also living tissue.

Gymnosperms lack xylem vessels but presence of xylem vessels is the characteristic of angiosperm.

144. Match List I with List II.

List I		List II	
(A)	Rose	(I)	Twisted aestivation
(B)	Pea	(II)	Perigynous flower
(C)	Cotton	(III)	Drupe
(D)	Mango	(IV)	Marginal placentation

Choose the correct answer from the options given below:

- (A) A-II, B-IV, C-I, D-III (B) A-I, B-II, C-III, D-IV
(C) A-IV, B-III, C-II, D-I (D) A-II, B-III, C-IV, D-I

NEET 2024

Correct Option: A

Solution:

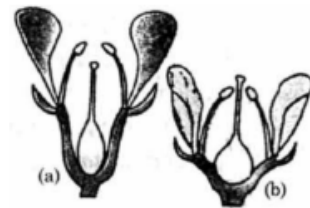
Rose has a half-inferior ovary, thus it is known as a Perigynous flower.

In Pea, the placenta forms a ridge along the ventral sut of the ovary and ovules are borne on this ridge forming two rows .

In Cotton, twisted aestivation is present.

In Mango, the fruit is a drupe.

145. Identify the type of flowers based on the position of the ovary, corolla and androecium with respect to the ovary from the given figures (a) and (b).



- (A) (a) Epigynous; (b) Hypogynous (B) (a) Hypogynous; (b) Epigynous
(C) (a) Perigynous; (b) Epigynous (D) (a) Perigynous; (b) Perigynous

NEET 2024

Correct Option: D

Solution:

If gynoecium is situated in the centre and other parts of the flower are located on the rim of the thalamus almost at the same level, it is called perigynous.

Both diagrams show the perigynous condition.

146. Which of the following is an example of actinomorphic flower?

- (A) Datura (B) Cassia (C) Pisum (D) Sesbania

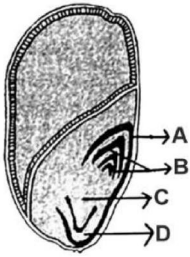
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Correct Option: A

Solution:

Datura shows actinomorphic flower. In Cassia, Pisum, and Sesbania, zygomorphic flowers are seen.

147. Identify the part of the seed from the given figure which is destined to form root when the seed germinates.



- (A) A (B) B (C) C (D) D

NEET 2024

Correct Option: C

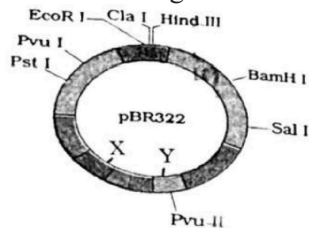
Solution:

Radicle is destined to form root.

In the given diagram 'C' represent radicle

148. The following diagram showing restriction sites in *E. coli* cloning vector pBR322.

Find the role of 'X' and 'Y' genes:



- (A) The gene 'X' is responsible for resistance to antibiotics and 'Y' for protein involved in the replication of Plasmid.
- (B) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.
- (C) The gene 'X' is for protein involved in replication of Plasmid and 'Y' for resistance to antibiotics.
- (D) Gene 'X' is responsible for recognitions sites and 'Y' is responsible for antibiotic resistance.

NEET 2024

Correct Option: B

Solution:

149. The "Ti plasmid" of *Agrobacterium tumefaciens* stands for

- (A) Tumour inhibiting plasmid
- (B) Tumor independent plasmid
- (C) Tumor inducing plasmid
- (D) Temperature independent plasmid

NEET 2

Correct Option: C

Solution:

Tumor inducing plasmid

150. Inhibition of Succinic dehydrogenase enzyme by onate is a classical example of :

- (A) Competitive inhibition (B) Enzyme activation
- (C) Cofactor inhibition (D) Feedback inhibition

NEET 2

Correct Option: A

Solution:

Inhibition of succinic dehydrogenase by malonate is an example of competitive inhibition. Malonate resembles the substrate succinate and competes with the substrate for the substrate-binding site of the enzyme. Consequently, the substrate cannot bind and as a result, the enzyme activity declines.

151. Read the following statements and choose the set of correct statements:

In the members of Phaeophyceae,

- A. Asexual reproduction occurs usually by biflagellate zoospores.
- B. Sexual reproduction is by oogamous method.
- C. Stored food is in the form of carbohydrates like mannitol or laminarin.
- D. The major pigments found are chlorophyll *a*, carotenoids and xanthophyll.
- E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin.

- (A) A, B, C and D only (B) B, C, D and E only
- (C) A, C, D and E only (D) A, B, C and E only

NEET 2

Correct Option: C

Solution:

In members of Phaeophyceae sexual reproduction is by oogamous, isogamous or anisogamous methods. The correct set of statements are A, C, D and E.

152. Match List I with List II

	List-I		List-II
A.	Rhizopus	I.	Mushroom
B.	Ustilago	II.	Smut fungus
C.	Puccinia	III.	Bread mould
D.	Agaricus	IV.	Rust fungus

Choose the correct answer from the options given below:

- (A) A-III, B-II, C-IV, D-I (B) A-I, B-III, C-II, D-IV
(C) A-III, B-II, C-I, D-IV (D) A-IV, B-III, C-II, D-I

NEET 2024

Correct Option: A

Solution:

Rhizopus is a bread mould fungus. Ustilago is a smut fungi. Puccinia is known as rust fungi. Agaricus is commonly called mushroom.

153. Match List I with List II :

List-I (Sub Phases of Prophase I)		List-II (Specific Characters)	
A.	Diakinesis	I.	Synaptonemal complex formation
B.	Pachytene	II.	Completion of terminalisation of chiasmata
C.	Zygotene	III.	Chromosomes look like thin threads
D.	Leptotene	IV.	Appearance of recombination nodules

Choose the correct answer from the options given below

- (A) A – II, B – IV, C – I, D – III (B) A – IV, B – II, C – III, D – I
(C) A – I, B – II, C – IV, D – III (D) A – IV, B – III, C – II, D – I

NEET 2024

Correct Option: A

Solution:

- (A) Diakinesis - Completion of terminalisation of chiasmata
(B) Pachytene-Appearance of recombination nodules

(C) Zygotene - Synaptonemal complex formation

(D) Leptotene-Chromosomes look like thin threads

A – II, B – IV, C – I, D – III

154. Given below are two statements:

Statement I: Chromosomes become gradually visible under light microscope during leptotene stage.

Statement II: The beginning of diplotene stage is recognized by dissolution of synaptonemal complex. In the light of the above statements, choose the correct answer from the options given below:

- (A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

NEET 2024

Correct Option: A

Solution:

- During leptotene stage the chromosomes become gradually visible under the light microscope.

- The beginning of diplotene is recognised by the dissolution of the synaptonemal complex and the tendency of the recombined homologous chromosomes of the bivalents to separate from each other except at the site of crossover.

Thus both statement I and II are correct.

155. Spindle fibers attach to kinetochores of chromosome during

- (A) Prophase (B) Metaphase (C) Anaphase (D) Telophase

NEET 2024

Correct Option: B

Solution:

Spindle fibers attach to kinetochores of chromosome in metaphase stage.

156. Given below are two statements:

Statement I: Mitochondria and chloroplasts both have double membranes bound organelles.

Statement II: Inner membrane of mitochondria is relatively less permeable, as compared to chloroplast.



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

- (A) Both Statement I and Statement II are correct.
 (B) Both Statement I and Statement II are incorrect.
 (C) Statement I is correct but Statement II is incorrect.
 (D) Statement I is incorrect but Statement II is correct.

NEET 2024

Correct Option: C

Solution:

Both mitochondria and chloroplasts are double membrane bound cell organelles.

Transport of ions occurs across the inner membrane of mitochondria. The inner membrane of chloroplast is impermeable to ions and metabolites. Therefore, it is said that inner membrane of mitochondria is relatively more permeable to that of chloroplast.

157. Match List I with List II:

List-I		List-II	
(A)	Axoneme	(I)	Centriole
(B)	Cartwheel pattern	(II)	Cilia and flagella
(C)	Crista	(III)	Chromosome
(D)	Satellite	(IV)	Mitochondria

Choose the correct answer from the options given below:

- (A) A-IV, B-III, C-II, D-I (B) A-IV, B-II, C-III, D-I
 (C) A-II, B-IV, C-I, D-III (D) A-II, B-I, C-IV, D-III

NEET 2024

Correct Option: D

Solution:

- Axoneme is seen in cilia and flagella
- Centriole shows cartwheel appearance
- Crista is found in mitochondria
- Satellite is present in chromosomes.

158. The DNA present in chloroplast is:

- (A) Linear, double stranded (B) Circular, double stranded

- (C) Linear, single stranded (D) Circular, single stranded

NEET 2

Correct Option: B

Solution:

The DNA present in chloroplast is circular double stranded.

159. Match List-I with List-II

List-I		List-II	
A.	Nucleolus	I.	Site of formation of glycolipid
B.	Centriole	II.	Organization like the cartwheel
C.	Leucoplasts	III.	Site for active ribosomal RNA synthesis
D.	Golgi apparatus	IV.	For storage of nutrients

Choose the correct answer from the options below:

- (A) A-III, B-II, C-IV, D-I (B) A-II, B-III, C-I, D-IV
 (C) A-III, B-IV, C-II, D-I (D) A-I, B-II, C-III, D-IV

NEET 2

Correct Option: A

Solution:

- Nucleolus is a site for active ribosomal RNA synthesis.
- Both the centrioles in a centrosome lie perpendicular to each other in which each has an organisation like the cartwheel.
- Leucoplasts are the colourless plastids of varied shapes and sizes with stored nutrients.
- Golgi apparatus is the important site for formation of glycoproteins and glycolipids.

**160. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R).
 Assertion (A) : Breast-feeding during initial period of infant growth is recommended by doctors for a healthy baby.**

Reason (R) : Colostrum contains several antibodies absolutely essential to develop resistance for the new born baby.

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

- (A) (A) is correct but (R) is not correct.
 (B) (A) is not correct but (R) is correct.
 (C) Both (A) and (R) are correct and (R) is the correct explanation of (A).
 (D) Both (A) and (R) are correct but (R) is NOT the correct explanation of (A).

NEET 2024

Correct Option: C

Solution:

Breast feeding during initial periods of infants growth is recommended by doctors for bringing a healthy baby because colostrum contains several antibodies absolutely essential for develop resistance for new born.

161. Match List I with List II :

	List I		List II
A.	Fibrous joints	I.	Adjacent vertebrae, limited movement
B.	Cartilaginous joints	II.	Humerus and pectoral girdle, rotational movement
C.	Hinge joints	III.	Skull, don't allow any movement
D.	Ball and socket joints	IV.	Knee, help in locomotion

Choose the correct answer from the options given below :

- (A) A-II, B-III, C-I, D-IV (B) A-III, B-I, C-IV, D-II
 (C) A-IV, B-II, C-III, D-I (D) A-I, B-III, C-II, D-IV

NEET 2024

Correct Option: B

Solution:

Fibrous joints - Seen in flat skull bones and do not allow any movement.

Cartilaginous joints - Present between adjacent vertebrae and allow limited movements.

Hinge joints - Present in knees and help in locomotion.

Ball and socket joints - Present between humerus and pectoral girdle and allow rotational movement.

162. Given below are some stages of human evolution. Arrange them in correct sequence. (Past to Recent)

- A. Homo habilis
 B. Homo sapiens
 C. Homo neanderthalensis
 D. Homo erectus

Choose the correct sequence of human evolution from the options given below :

- (A) C-B-D-A (B) A-D-C-B (C) D-A-C-B (D) B-A

NEET 2

Correct Option: B

Solution:

Homo habilis (A) → Homo erectus (D) → Homo neanderthalensis (C) → Homo sapiens (B).

163. Match List I with List II:

	List-I		List-II
A.	Mesozoic Era	(I)	Lower invertebrates
B.	Proterozoic Era	(II)	Fish and Amphibia
C.	Cenozoic Era	(III)	Birds and Reptiles
D.	Paleozoic Era	(IV)	Mammals

Choose the correct answer from the options given below :

- (A) A-I, B-II, C-IV, D-III (B) A-III, B-I, C-IV, D-II
 (C) A-II, B-I, C-III, D-IV (D) A-III, B-I, C-II, D-I

NEET 2

Correct Option: B

Solution:

Mesozoic Era - Birds and reptiles Proterozoic Era - Lower invertebrates Coenozoic Era - Mammals Paleozoic Era - Fish and amphibians

164. Match List I with List II

	List I		List II
A	Citric acid cycle	I	Cytoplasm
B	Glycolysis	II	Mitochondrial matrix
C	Electron transport system	III	Intermembrane space of mitochondria
D	Proton gradient	IV	Inner mitochondrial membrane

Choose the correct answer from the options given below:

- (A) A-III, B-IV, C-I, D-II (B) A-IV, B-III, C-II, D-I
(C) A-I, B-II, C-III, D-IV (D) A-II, B-I, C-IV, D-III

NEET 2024

Correct Option: D**Solution:**

Citric acid cycle	Mitochondrial matrix
Glycolysis	
Glycolysis	Cytoplasm
Electron transport system	Inner mitochondrial Membrane
Proton gradient	Intermembrane space of Mitochondria

165. The following are the statements about nonchordates :

- A. Pharynx is perforated by gill slits.
B. Notochord is absent
C. Central nervous system is dorsal
D. Heart is dorsal if present
E. Post anal tail is absent

Choose the most appropriate answer from the options given below

- (A) A, B & D only (B) B, D & E only
(C) B, C & D only (D) A & C only

NEET 2024

Correct Option: B**Solution:**

Non-chordates

Notochord absent.

Central nervous system is ventral, solid and double.

Gill slits are absent.

Heart is dorsal (if present).

Post-anal tail is absent.

166. In a plant, black seed colour (BB/Bb) is dominant over white seed colour (bb). In order to find out the genotype of the black seed plant, with which of the following genotype will you cross it?

- (A) bb (B) Bb (C) BB/Bb (D) BB

NEET 2

Correct Option: A**Solution:**

In a plant, black seed colour (BB/Bb) is dominant over white seed colour (bb). In order to find out the genotype of the black seed plant we cross with bb genotype.

167. Lecithin, a small molecular weight organic compound found in living tissues, is an example of:

- (A) Amino acids (B) Phospholipids
(C) Glycerides (D) Carbohydrates

NEET 2

Correct Option: B**Solution:**

Lecithin is a specific type of phospholipid (specifically phosphoglyceride) that contains a phosphate group, glycerol, two fatty acids, and a choline group. It is a vital component of cell membranes in all living organisms and is commonly found in high concentrations in tissues like egg yolks and soybeans.

168. Given below are two statements:

Statement I: Bt toxins are insect group specific and coded by a gene cry IAc.

Statement II: Bt toxin exists as inactive protoxin in *thuringiensis*. However, after ingestion by the insect, the inactive protoxin gets converted into active form due to the acidic pH of the insect gut.

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

- (A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

NEET 2024**Correct Option: C****Solution:**

169. Match List I with List II:

List I	List II
A. <i>Clostridium butylicum</i>	I. Ethanol
B. <i>Saccharomyces cerevisiae</i>	II. Streptokinase
C. <i>Trichoderma polysporum</i>	III. Butyric acid
D. <i>Streptococcus</i> sp.	IV. Cyclosporin-A

Choose the correct answer from the options given below:

- (A) A-III, B-I, C-II, D-IV (B) A-II, B-IV, C-III, D-I
(C) A-III, B-I, C-IV, D-II (D) A-IV, B-I, C-III, D-II

NEET 2024**Correct Option: C****Solution:**

Clostridium butylicum → Butyric acid (III)

Saccharomyces cerevisiae → Ethanol (I)

Trichoderma polysporum → Cyclosporin-A (IV)

Streptococcus sp. → Streptokinase (II)

170. The lactose present in the growth medium of bacteria is transported to the cell by the action of:

- (A) Beta-galactosidase (B) Acetylase
(C) Permease (D) Polymerase

NEET 2024**Correct Option: C****Solution:**

In the Lac operon of bacteria:

Permease helps in the transport of lactose into the bacterial cell.

It is encoded by the lac Y gene.

171. A transcription unit in DNA is defined primarily by three regions in DNA and these are with respect to upstream and downstream end;

- (A) Repressor, Operator gene, Structural gene
(B) Structural gene, Transposons, Operator gene
(C) Inducer, Repressor, Structural gene
(D) Promotor, Structural gene, Terminator

NEET 2**Correct Option: D****Solution:**

A transcription unit in DNA consists of three main regions:

Promoter → Located at the upstream (5') end; RNA polymerase binds here to start transcription.

Structural gene → The region that is transcribed into RNA.

Terminator → Located at the downstream (3') end; signals the end of transcription.

172. The cofactor of the enzyme carboxypeptidase is:

- (A) Zinc (B) Niacin (C) Flavin (D) Haem

NEET 2**Correct Option: A****Solution:**

Carboxypeptidase is a zinc-dependent metalloenzyme that helps digest proteins by removing amino acids one by one from the C-terminal end of a polypeptide chain.

173. Given below are two statements:

Statement I: In C_3 plants, some O_2 binds to RuBisCo, hence CO_2 fixation is decreased.

Statement II: In C_4 plants, mesophyll cells show little photorespiration while bundle sheath cells show photorespiration.

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

- (A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

NEET 2

Correct Option: C**Solution:****174.** Match List I with List II:

List I	List II
A. Common cold	I. Plasmodium
B. Haemozoin	II. Typhoid
C. Widal test	III. Rhinoviruses
D. Allergy	IV. Dust mites

Choose the correct answer from the options given below:

- (A) A-II, B-IV, C-III, D-I (B) A-I, B-III, C-II, D-IV
(C) A-III, B-I, C-II, D-IV (D) A-IV, B-II, C-III, D-I

NEET 2024**Correct Option: C****Solution:**

- A. Common cold → III. Rhinoviruses
- B. Haemozoin → I. Plasmodium
- C. Widal test → II. Typhoid
- D. Allergy → IV. Dust mites

175. Which one is the correct product of DNA dependent RNA polymerase to the given template?
3' TACATGGCAAATATCCATTCA 5'

- (A) 5' AUGUACCGUUUAUAGGUAAGUAAGU 3' (B) 5' AUGUACCGUUUAUAGGUAAGUAAGU 3'
(C) 5' AUGUACCGUUUAUAGGUAAGUAAGU 3' (D) 5' AUGUACCGUUUAUAGGUAAGUAAGU 3'

NEET 2024**Correct Option: A****Solution:****176.** Match List I with List II:

List I	List II
A. Exophthalmic goiter	I. Excess secretion of cortisol, moon face & hyperglycemia

B. Acromegaly	II. Hypo-secretion of thyroid hormone & stunted growth.
C. Cushing's syndrome	III. Hyper secretion of thyroid hormone & protruding eye balls.
D. Cretinism	IV. Excessive secretion of growth hormone.

Choose the correct answer from the options below:

- (A) A-I, B-III, C-II, D-IV (B) A-IV, B-II, C-I, D-III
(C) A-III, B-IV, C-II, D-I (D) A-III, B-IV, C-I, D-II

NEET 2**Correct Option: D****Solution:**

- Exophthalmic goiter → hyperthyroidism with protruding eyeballs
- Acromegaly → excess growth hormone
- Cushing's syndrome → excess cortisol
- Cretinism → low thyroid hormone in childhood causing stunted growth.

177. Match List I with List II

List-I	List-II
(A) RNA Polymerase III	(I) snRNPs
(B) Termination of transcription	(II) Promotor
(C) Splicing of Exons	(III) Rho factor
(D) TATA box	(IV) SnRNAs, tRNA

Choose the correct answer from the options given below:

- (A) A-III, B-II, C-IV, D-I (B) A-III, B-IV, C-I, D-II
(C) A-IV, B-III, C-I, D-II (D) A-I, B-III, C-IV, D-II

NEET 2**Correct Option: C****Solution:**

- A. RNA polymerase III - IV. SnRNAs, tRNA
- B. Termination of transcription - III. Rho factor
- C. Splicing of Exons - I. snRNPs
- D. TATA box - II. Promoter

178. What is the fate of a piece of DNA carrying only gene of interest which is transferred into an alien organism?

- A. The piece of DNA would be able to multiply itself independently in the progeny cells of the organism.
- B. It may get integrated into the genome of the recipient.
- C. It may multiply and be inherited along with the host DNA.
- D. The alien piece of DNA is not an integral part of chromosome.
- E. It shows ability to replicate

- (A) D and E only (B) B and C only
- (C) A and E only (D) A and B only

NEET 2024

Correct Option: B

Solution:

- A. The piece of DNA would be able to multiply itself independently → False
- B. It may get integrated into the genome of the recipient → True
- C. It may multiply and be inherited along with the host DNA (after integration into the host genome) → True
- D. The alien piece of DNA is not an integral part of chromosome → Not necessarily true; if integrated, it becomes part of the chromosome.
- E. It shows ability to replicate → False, because the gene alone lacks replication machinery.

179. Match List I with List II

	List-I		List-II
(A)	P-wave	(I)	Heart muscles are electrically silent
(B)	QRS complex	(II)	Depolarization of ventricles
(C)	T-wave	(III)	Depolarisation of atria
(D)	T-p gap	(IV)	Re polarization of ventricles

Choose the correct answer from the options given :

- (A) A-III, B-II, C-IV, D-I (B) A-II, B-III, C-I, D-IV
- (C) A-IV, B-II, C-I, D-III (D) A-I, B-III, C-IV, D-II

NEET 2

Correct Option: A

Solution:

- A. Pwave III. Depolarisation of atria
- B. QRS complex II. Depolarisation of ventricles
- C. Twave IV. Repolarisation of ventricles
- D. T-P gap I. Heart muscles are electrically silent

180. Match List I with List II:

List I	List II
A. Robert May	I. Species - area relationship
B. Alexander von Humboldt	II. Long term ecosystem experiment using outplots
C. Paul Ehrlich	III. Global species diversity at about 7 million
D. David Tilman	IV. Rivet popper hypothesis

Choose the correct answer from the options below:

- (A) A-III, B-I, C-IV, D-II (B) A-I, B-III, C-II, D-IV
- (C) A-III, B-IV, C-II, D-I (D) A-II, B-III, C-I, D-IV

NEET 2

Correct Option: A

Solution:

Robert May

Estimated global species diversity (about 7 million)→

B. Alexander von Humboldt

Species–area relationship→ I

C. Paul Ehrlich

Rivet popper hypothesis (loss of species affects ecosystem stability)→ IV

David Tilman

Long-term ecosystem experiments using outdoor plots→ II

181. The type of conservation in which the threatened species are taken out from their natural habitat and placed in special setting where they can be protected and given special care is called;

- (A) in-situ conservation (B) Semi-conservative method
(C) Sustainable development (D) ex-situ conservation

NEET 2024

Correct Option: D

Solution:

conservation where threatened species are removed from their natural habitat and protected in special settings is actually **ex-situ conservation**.

182. Following are the stages of cell division :

- A. Gap 2 phase
B. Cytokinesis
C. Synthesis phase
D. Karyokinesis
E. Gap 1 phase

Choose the correct sequence of stages from the options given below

- (A) $E - B - D - C$ (B) $B - D - E - C$ (C) $E - C - A - D$ (D) $C - D - E - A - B$

NEET 2024

Correct Option: C

Solution:

$E - C - A - D - B$

183. Following are the stages of pathway for conduction of an action potential through the heart:

- A. AV bundle
B. Purkinje fibres
C. AV node

D. Bundle branches

E. SA node

Choose the correct sequence of pathway from the options given below:

- (A) $A - E - C - B - D$ (B) $B - D - E - C - A$ (C) $E - A - D - C - B$ (D) $E - C - A - D - B$

NEET 2

Correct Option: D

Solution:

$E - C - A - D - B$

184. Match List I with List II:

List-I		List-II	
(A)	α -1 antitrypsin	(I)	Cotton bollworm
(B)	Cry IAb	(II)	ADA deficiency
(C)	Cry IAc	(III)	Emphysema
(D)	Enzyme replacement therapy	(IV)	Corn borer

- (A) A-III, B-I, C-II, D-IV (B) A-III, B-IV, C-I, D-II
(C) A-II, B-IV, C-I, D-III (D) A-II, B-I, C-IV, D-III

NEET 2

Correct Option: B

Solution:

List-I			
(A)	α -1 antitrypsin	(III)	E
(B)	Cry IAb	(IV)	C
(C)	Cry IAc	(I)	C
(D)	Enzyme replacement therapy	(II)	A

185. Identify the step in tricarboxylic acid cycle, which not involve oxidation of substrate.

- (A) Succinic acid → Malic acid
(B) Succinyl-CoA → Succinic acid
(C) Isocitrate → α -ketoglutaric acid
(D) Malic acid → Oxaloacetic acid

NEET 2

Correct Option: B

**Solution:**

The step in tricarboxylic acid cycle, which does not involve oxidation of substrate.

Succinyl-CoA → Succinic acid

186. Which of the following are required for the dark reaction of photosynthesis?

- A. Light
- B. Chlorophyll
- C. CO₂
- D. ATP
- E. NADPH

Choose the correct answer from the options given below:

- (A) B, C and D only
- (B) C, D and E only
- (C) D and E only
- (D) A, B and C only

NEET 2024

Correct Option: B

Solution:

The following are required for the dark reaction of photosynthesis:

- C. CO₂
- D. ATP
- E. NADPH

187. Which of the following are fused in somatic hybridization involving two varieties of plants?

- (A) Somatic embryos (B) Protoplasts
- (C) Pollens (D) Callus

NEET 2024

Correct Option: B

Solution:

Protoplasts are fused in somatic hybridization involving two varieties of plants

188. These are regarded as major causes of biodiversity loss:

- A. Over exploitation
- B. Co-extinction

- C. Mutation
- D. Habitat loss and fragmentation
- E. Migration

Choose the correct option

- (A) A, B, C and D only (B) A, B and E only
- (C) A, B and D only (D) A, C and D only

NEET 2

Correct Option: C

Solution:

The major causes of biodiversity loss:

- A. Over exploitation
- B. Co-extinction
- D. Habitat loss and fragmentation

189. Given below are two statements :

Statement-I: Gause's competitive exclusion principle states that two closely related species competing for different resources can not exist indefinitely.

Statement-II: According to Gause's principle, during competition, the inferior will be eliminated. This may be true if resources are limiting.

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

- (A) Both Statement I and Statement II are false
- (B) Statement I is true but Statement II is false
- (C) Statement I is false but Statement II is true
- (D) Both Statement I and Statement II are true

NEET 2

Correct Option: C

Solution:

Statement-I: Gause's competitive exclusion principle states that two closely related species competing for same resources can not exist indefinitely.

Statement - II : According to Gause's principle, during competition, the inferior will be eliminated. This may be true if resources are limiting.

190. Choose the correct statement given below regarding juxta medullary nephron.

- (A) Renal corpuscle of juxta medullary nephron lies in the outer portion of the medulla.

- (B) Loop of henle of juxta medullary nephron runs deep into medulla.
- (C) Juxta medullary nephrons out number the cortical nephrons.
- (D) Juxta medullary nephrons are located in the columns of Bertini.

NEET 2024**Correct Option: B****Solution:**

Loop of henle of juxta medullary nephron runs deep into medulla.

191. Match List I with List II

List-I		List-II	
(A)	GLUT-4	(I)	Hormone
(B)	Insulin	(II)	Enzyme
(C)	Trypsin	(III)	Intercellular ground substance
(D)	Collagen	(IV)	Enables glucose transport into cells

Choose the correct answer from the options given below.

- (A) A-II, B-III, C-IV, D-I (B) A-III, B-IV, C-I, D-II
- (C) A-IV, B-I, C-II, D-III (D) A-I, B-II, C-III, D-IV

NEET 2024**Correct Option: C****Solution:**

GLUT-4 enables glucose transport into cells. Insulin is a hormone secreted by pancreas. Trypsin is an example of enzyme. Collagen is the most abundant protein in animal world, which is an intercellular ground substances.

192. Regarding catalytic cycle of an enzyme action, select the correct sequential steps :

- A. Substrate enzyme complex formation.
- B. Free enzyme ready to bind with another substrate.
- C. Release of products.
- D. Chemical bonds of the substrate broken.
- E. Substrate binding to active site.

Choose the correct answer from the options given below :

- (A) B, A, C, D, E (B) E, D, C, B, A
- (C) E, A, D, C, B (D) A, E, B, D, C

NEET 2**Correct Option: C****Solution:**

The correct sequential steps in the enzyme action is as follows:

- A. Substrate binding to active site.
- B. Substrate enzyme complex formation.
- C. Chemical bonds of the substrate broken.
- D. Release of products.
- E. Free enzyme ready to bind with another substrate.

193. Match List I with List II :

List-I		List-II	
(A)	Lipase	(I)	Peptide bond
(B)	Nuclease	(II)	Ester bond
(C)	Protease	(III)	Glycosidic bond
(D)	Amylase	(IV)	Phosphodiester bond

Choose the correct answer from the options given :

- (A) A-II, B-IV, C-I, D-III (B) A-IV, B-I, C-III, I
- (C) A-IV, B-II, C-III, D-I (D) A-III, B-II, C-I, I

NEET 2**Correct Option: A****Solution:**

List-I		List-II	
(A)	Lipase	(II)	Ester bond
(B)	Nuclease	(IV)	Phosphodiester bond
(C)	Protease	(I)	Peptide bond
(D)	Amylase	(III)	Glycosidic bond

194. Which one of the following is not a criterion for classification of fungi?

- (A) Mode of spore formation (B) Type of fruiting body
(C) Morphology of mycelium (D) Mode of nutrition

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Correct Option: D**Solution:**

According to NCERT Biology, fungi are classified mainly on the basis of:

1. Morphology of mycelium — the structure and appearance of the fungal hyphae.
2. Mode of spore formation — the method by which reproductive spores are produced.
3. Type of fruiting body — the structure formed during reproduction.

195. Which of the following statement is correct regarding the process of replication in *E. coli*?

- (A) The DNA dependent DNA polymerase catalyses polymerization in $5' \rightarrow 3'$ as well as $3' \rightarrow 5'$ direction.
- (B) The DNA dependent DNA polymerase catalyses polymerization in $5' \rightarrow 3'$ direction.
- (C) The DNA dependent DNA polymerase catalyses polymerization in one direction that is $3' \rightarrow 5'$.
- (D) The DNA dependent RNA polymerase catalyses polymerization in one direction that is $5' \rightarrow 3'$.

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Correct Option: B**Solution:**

In Prokaryotes, like *E. coli* during replication, the DNA dependent DNA polymerase catalyse polymerization only in one direction, that is $5' \rightarrow 3'$.

196. Identify the correct description about the given figure:



- (A) Cleistogamous flowers showing autogamy.
- (B) Compact inflorescence showing cor autogamy.
- (C) Wind pollinated plant inflorescence showing stamens with well exposed stamens.
- (D) Water pollinated flowers showing stamens with cilaginous covering.

NEET 2

Correct Option: C**Solution:**

The given diagram shows a wind pollinated plant show compact inflorescence and well exposed stamens. Stamens are exposed so complete autogamy does not occur.

197. A pink flowered Snapdragon plant was cross with white flowered Snapdragon plant. What type of phenotypic ratio is/are expected in the progeny?

- (A) Only pink flowered plants
- (B) Red, Pink as well as white flowered plant
- (C) Only red flowered plants
- (D) Red flowered as well as pink flowered plant

NEET 2

Correct Option: D**Solution:**

Red flowered as well as pink flowered plant.

198. Match List-I with List-II :

List-I	List-II
A. Down's syndrome	I. 11 th chromosome
B. α -Thalassemia	II. 'X' chromosome
C. β -Thalassemia	III. 21 st chromosome
D. Klinefelter's syndrome	IV. 16 th chromosome

Choose the correct answer from the options given

- (A) A-IV,B-I,C-II,D-III (B) A-I,B-II,C-III,D-IV



(C) A-III,B-IV,C-I,D-II

(D) A-II,B-III,C-IV,D-I

NEET 2024**Correct Option: C****Solution:**

199. Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli?

(A) Low $p\text{CO}_2$ and High H^+ concentration(B) Low $p\text{CO}_2$ and High temperature(C) High $p\text{O}_2$ and High $p\text{CO}_2$ (D) High $p\text{O}_2$ and Lesser H^+ concentration**NEET 2024****Correct Option: D****Solution:**

In alveoli, hemoglobin binds oxygen easily when:

- Oxygen ($p\text{O}_2$) is high

- Acidity (H^+) is low

200. Given below are two statements.

Statement I: Bone marrow is the main lymphoid where all blood cells including lymphocyte produced.

Statement II: Both bone marrow and thymus provide micro environments for the development and maturation of T-lymphocytes.

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

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

(B) Both Statement I and Statement II are incorrect

(C) Statement I is correct but Statement II is incorrect

(D) Statement I is incorrect but Statement II is correct

NEET 2024**Correct Option: A****Solution:**

Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced. Both bone marrow and thymus provide micro-environments for the development and maturation of T-lymphocytes. After maturation the lymphocytes migrate to secondary lymphoid organs like spleen, lymph nodes, tonsils, Peyer's patches of small intestine and appendix.

NEET 2024 Paper - ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	A	A	D	B	B	B	B	A	B	C
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	D	B	D	C	C	D	B	D	B	B
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	B	C	B	B	C	B	A	D	C	A
Que.	31	32	33	34	35	36	37	38	39	40
Ans.	B	B	A	A	A	D	A	B	B	A
Que.	41	42	43	44	45	46	47	48	49	50
Ans.	C	B	A	A	D	D	B	B	C	D
Que.	51	52	53	54	55	56	57	58	59	60
Ans.	B	A	A	C	A	B	D	D	C	B
Que.	61	62	63	64	65	66	67	68	69	70
Ans.	A	D	D	A	C	A	A	C	A	A
Que.	71	72	73	74	75	76	77	78	79	80
Ans.	C	A	D	A	D	D	D	A	C	B
Que.	81	82	83	84	85	86	87	88	89	90
Ans.	D	B	B	B	A	D	A	A	C	B
Que.	91	92	93	94	95	96	97	98	99	100
Ans.	A	A	A	A	A	A	D	B	B	A
Que.	101	102	103	104	105	106	107	108	109	110
Ans.	A	A	B	B	B	D	B	D	C	A
Que.	111	112	113	114	115	116	117	118	119	120
Ans.	B	A	B	A	D	C	D	A	C	B
Que.	121	122	123	124	125	126	127	128	129	130

Ans.	B	C	D	A	C	A	A	D	B	C
Que.	131	132	133	134	135	136	137	138	139	140
Ans.	C	B	B	A	C	D	B	C	D	A
Que.	141	142	143	144	145	146	147	148	149	150
Ans.	A	C	D	A	D	A	C	B	C	A
Que.	151	152	153	154	155	156	157	158	159	160
Ans.	C	A	A	A	B	C	D	B	A	C
Que.	161	162	163	164	165	166	167	168	169	170
Ans.	B	B	B	D	B	A	B	C	C	C
Que.	171	172	173	174	175	176	177	178	179	180
Ans.	D	A	C	C	A	D	C	B	A	A
Que.	181	182	183	184	185	186	187	188	189	190
Ans.	D	C	D	B	B	B	B	C	C	B
Que.	191	192	193	194	195	196	197	198	199	200
Ans.	C	C	A	D	B	C	D	C	D	A