NEET-UG EXAMINATION PAPER-2024

(Solved)

Time allowed : 3 hours | Maximum Marks : 800

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **200 questions.** All questions are **compulsory.**

ii. This question paper is divided into **1 sections.**

iii. **Section A** – questions number **1 to 200** are multiple choice questions

iv. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

v. Use of calculator is NOT allowed.

Section A

Question 1.

Match List I with List II. Choose the correct answer from the options given below

[4 Marks]

List I (Molecule)	List II (Number and types of bonds 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-bonds
D. ethyne	IV. one σ-bond and one π-bond

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

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

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

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

Question 2.

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

[4 Marks]

(A) A > B > C

(B) B > C > A

(C) A > C > B

(D) B > A > C

Question 3.

Statement I: The boiling points of hydrides of Group 16 elements follow the order $H_2O > H_2Te > H_2Se > H_2S$

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

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

[4 Marks]

(A) Statement I is true but Statement II is false

(B) Statement I is false but Statement II is true

(C) Both Statement I and Statement II are false

(D) Both Statement I and Statement II are true

Question 4.

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:

[4 Marks]

(A) Statement I is false but Statement II is true

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are false

(D) Both Statement I and Statement II are true

Question 5. 1 gram of sodium hydroxide was treated with 25 mL of 0.75 M HCl solution. The mass of sodium hydroxide left unreacted is equal to:

[4 Marks]

(A) 750 mg

(B) 250 mg

(C) Zero mg

(D) 200 mg

Question 6. 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:

[4 Marks]

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

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

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

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

Question 7. Activation energy of any chemical reaction can be calculated if one knows the value of

[4 Marks]

(A) probability of collision

(B) rate constant at standard temperature

(C) rate constant at two different temperatures

(D) orientation of reactant molecules during collision

Question 8.

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

Statement II: Aniline cannot be prepared through Gabriel synthesis.

In the light of the above statements,

choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is correct but Statement II is false

(B) Statement I is incorrect but Statement II is true

(C) Both statement I and Statement II are false

(D) Both statement I and Statement II are true

Question 9. Arrange the following elements in increasing order of electronegativity: N, O, F, C, Si
Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

Question 10.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I (Conversion required)	**List II (Number of Faraday**
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_2O_3	IV. 5F

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

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

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

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

Question 11. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List I (Complex)		List II (Type of isomerism)	
A.	$[Co(NH_3)_5(NO_2)]Cl_2$	I.	Solvate isomerism
B.	$[Co(NH_3)_5(SO_4)]Br$	II.	Linkage isomerism
C.	$[Co(NH_3)_6][Cr(CN)_6]$	III.	Ionization isomerism
D.	$[Co(H_2O)_6]Cl_3$	IV.	Coordination isomerism

(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

Question 12.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 13. 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

[4 Marks]

(A) - x

(B) - x/9

(C) - 4/9 x

(D) - 4x

Question 14.

In which of the following processes entropy increases?

A. A liquid evaporates to vapour.

B. Temperature of a crystalline solid lowered from 130 K to 0 K.

C. $2\ NaHCO_3(s) \rightarrow Na_2CO_3(s) + CO_2(g) + H_2O(g)$

D. $Cl_2(g) \rightarrow 2Cl(g)$

Choose the correct answer from the options given below:

[4 Marks]

(A) C and D

(B) A, C and D

(C) A and C

(D) A, B and D

Question 15.

Which reaction is NOT a redox reaction?

[4 Marks]

(A) $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$

(B) $H_2 + Cl_2 \rightarrow 2HCl$

(C) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

(D) $2KClO_3 + I_2 \rightarrow 2KIO_3 + Cl_2$

Question 16.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 17.

'Spin only' magnetic moment is same for which of the following ions?

A. Ti^{3+}

B. Cr^{2+}

C. Mn^{2+}

D. Fe^{2+}

E. Sc^{3+}

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) A and D only

(B) A and E only

(C) B and D only

(D) B and C only

Question 18.

The highest number of helium atoms is in

[4 Marks]

(A) 2.271098 L of helium at STP

(B) 4 g of helium

(C) 4 u of helium

(D) 4 mol of helium

Question 19. Among Group 16 elements, which one does NOT show −2 oxidation state?

[4 Marks]

(A) Te

(B) Se

(C) Po

(D) O

Question 20. The E° value for the Mn^{3+}/Mn^{2+} couple is more positive than that of Cr^{3+}/Cr^{2+} or Fe^{3+}/Fe^{2+} due to change of

[4 Marks]

(A) d^5 to d^2 configuration

(B) d^3 to d^5 configuration

(C) d^4 to d^5 configuration

(D) d^5 to d^4 configuration

Question 21.

The reagents with which glucose does NOT react to give the corresponding test/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:

[4 Marks]

(A) B and E

(B) E and D

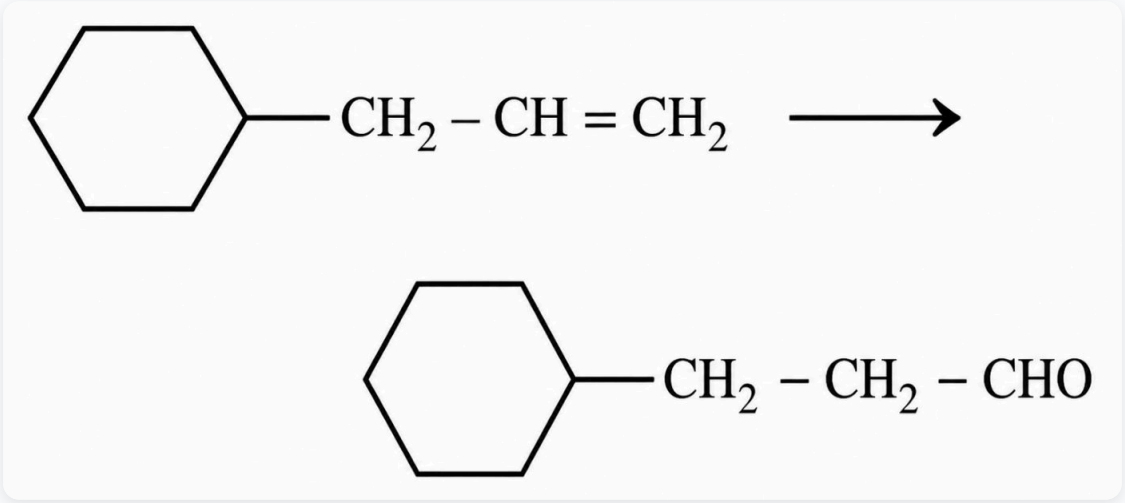
(C) A and D

(D) B and C

Question 22.

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

[4 Marks]



(A)

(i) H_2O/H^+
(ii) CrO_3
(iii) PCC

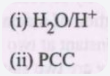
(B)

(i) BH_3
(ii) $H_2O_2/\overset{\ominus}{O}H$

(C)

(i) BH_3
(ii) $H_2O_2/\overset{\ominus}{O}H$
(iii) alk.$KMnO_4$
(iv) $H_3O^{\oplus}$

(D)



Question 23. In which of the following equilibria, K_p and K_C are NOT equal?

[4 Marks]

(A) $PCl_5(g) \rightleftharpoons PCl_3(g) + Cl_2(g)$

(B) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$

(C) $CO(g) + H_2O(g) \rightleftharpoons CO_2(g) + H_2(g)$

(D) $2BrCl(g) \rightleftharpoons Br_2(g) + Cl_2(g)$

Question 24.

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

[4 Marks]

(A) 2,2-dimethylbutane

(B) 2-methylpentane

(C) 2,3-dimethylbutane

(D) n-hexane

Question 25. Fehling's solution 'A' is

[4 Marks]

(A) aqueous copper sulphate

(B) alkaline copper sulphate

(C) aqueous sodium citrate

(D) alkaline solution of sodium potassium tartrate (Rochelle's salt)

Question 26.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 27. Statement I: Both $[Co(NH_3)_6]^{3+}$ and $[CoF_6]^{3-}$ complexes are octahedral but differ in their magnetic behaviour. Statement II: $[Co(NH_3)_6]^{3+}$ is diamagnetic whereas $[CoF_6]^{3-}$ is paramagnetic. In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

(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

Question 28. 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

[4 Marks]

(A) Crystallization

(B) Distillation

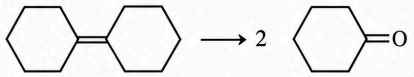
(C) Chromatography

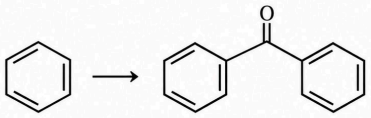
(D) Sublimation

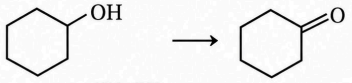
Question 29. Match List I with List II. Choose the correct answer from the options given below:

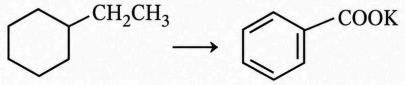
[4 Marks]

List I
(Reaction)

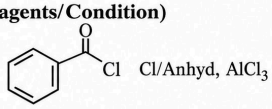
A. 

B. 

C. 

D. 

List II
(Reagents/Condition)

I. 

II. CrO_3

III. $KMnO_4/KOH, \Delta$

IV. (i) O_3
(ii) $Zn\text{-}H_2O$

(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

Question 30. For the reaction $2A \rightleftharpoons B + C$, $K_c = 4\times10^{-3}$. 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?

[4 Marks]

(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.

Question 31.

The pair of lanthanoid ions which are diamagnetic is

[4 Marks]

(A) Ce^{3+} and Eu^{2+}

(B) Ce^{4+} and Yb^{2+}

(C) Gd^{3+} and Eu^{3+}

(D) Pm^{3+} and Sm^{3+}

Question 32.

Statement I: $[Co(NH_3)_6]^{3+}$ is a homoleptic complex whereas $[Co(NH_3)_4Cl_2]^{+}$ is a heteroleptic complex. Statement II: Complex $[Co(NH_3)_6]^{3+}$ has only one kind of ligands but $[Co(NH_3)_4Cl_2]^{+}$ has more than one kind of ligands. In the light of the above statements, choose the correct answer from the options given below.

[4 Marks]

(A) Statement I is false but Statement II is true

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are false

(D) Both Statement I and Statement II are true

Question 33.

Mass in grams of copper deposited by passing 9.6487 A current through a voltameter containing copper sulphate solution for 100 seconds is (Given : Molar mass of Cu : 63 g mol^{-1}, 1 F = 96487 C)

[4 Marks]

(A) 31.5 g

(B) 3.15 g

(C) 0.0315 g

(D) 0.315 g

Question 34.

The products A and B obtained in the following reactions, respectively, are $3ROH + PCl_3 \rightarrow RCl + A$ $ROH + PCl_5 \rightarrow RCl + HCl + B$

[4 Marks]

(A) H_3PO_3 and $POCl_3$

(B) H_3PO_4 and $POCl_3$

(C) $POCl_3$ and H_3PO_4

(D) $POCl_3$ and H_3PO_3

Question 35.

The rate of a reaction quadruples when temperature changes from 27°C to 57°C. Calculate the energy of activation. Given: R=8.314 J K^{-1} mol^{-1}, log4=0.6021

[4 Marks]

(A) 3804 kJ/mol

(B) 3.80 kJ/mol

(C) 380.4 kJ/mol

(D) 38.04 kJ/mol

Question 36.

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?

[4 Marks]

(A) dilute sulphuric acid

(B) dilute nitric acid

(C) concentrated sulphuric acid

(D) dilute hydrochloric acid

Question 37. The plot of osmotic pressure (π) vs concentration (mol L^{-1}) for a solution gives a straight line with slope 25.73 L bar mol^{-1}. The temperature at which the osmotic pressure measurement is done is: (Use R = 0.083 L bar mol^{-1} K^{-1})

[4 Marks]

(A) 37°C

(B) 25.73°C

(C) 12.05°C

(D) 310°C

Question 38.

Identify the correct answer.

[4 Marks]

(A) Three canonical forms can be drawn for CO_3^{2-} ion.

(B) Dipole moment of NF_3 is greater than that of NH_3.

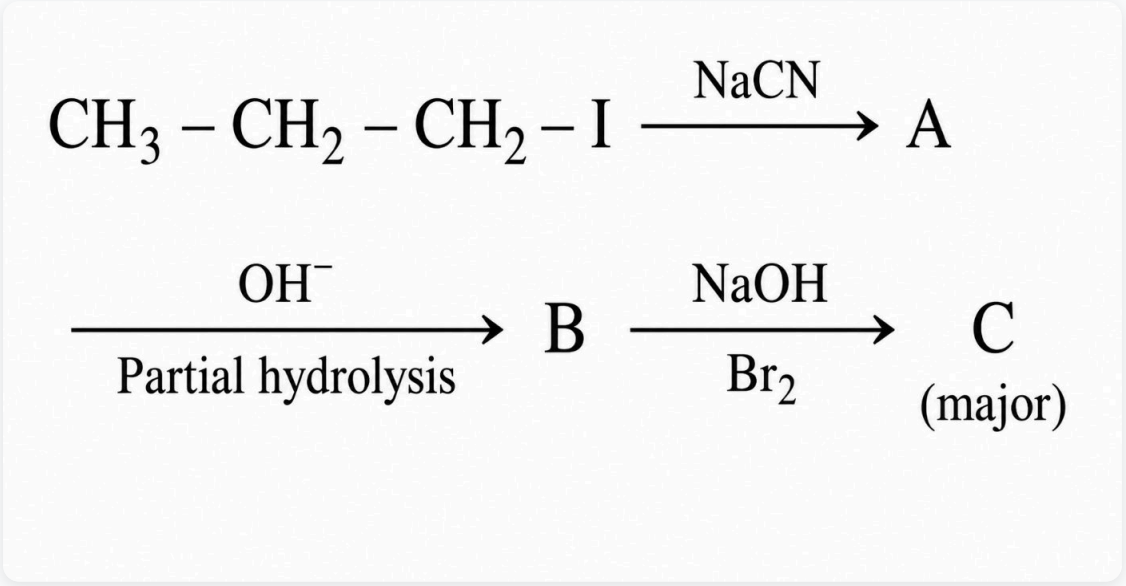
(C) Three resonance structures can be drawn for ozone.

(D) BF_3 has non-zero dipole moment.

Question 39.

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

[4 Marks]



(A) propylamine

(B) butanamide

(C) butylamine

(D) α-bromobutanoic acid

Question 40.

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.

[4 Marks]

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

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

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

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

Question 41. The work done during reversible isothermal expansion of one mole of hydrogen gas at 25°C from pressure of 20 atmosphere to 10 atmosphere is: (Given R = 2.0 cal K^{-1} mol^{-1})

[4 Marks]

(A) 0 calorie

(B) –413.14 calories

(C) 413.14 calories

(D) 100 calories

Question 42.

Consider the following reaction in a sealed vessel at equilibrium with concentrations of $N_2 = 3.0 \times 10^{-3}$ M, $O_2 = 4.2 \times 10^{-3}$ M and NO = 2.8×10^{-3} M. $2NO(g) \rightleftharpoons N_2(g) + O_2(g)$ If 0.1 mol L^{-1} of NO(g) is taken in a closed vessel, what will be the degree of dissociation (α) of NO(g) at equilibrium?

[4 Marks]

(A) 0.0889

(B) 0.00889

(C) 0.8889

(D) 0.717

Question 43.

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 = 32 u)

[4 Marks]

(A) ABC_3

(B) AB_2C_2

(C) ABC_4

(D) A_2BC_2

Question 44.

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 (cm) is:

[4 Marks]

(A) 10 (N+1)

(B) 1/100(N+1)

(C) 100 N

(D) 1/10 N

Question 45. If the monochromatic source in Young's double slit experiment is replaced by white light, then

[4 Marks]

(A) There will be a central dark fringe surrounded by a few coloured fringes.

(B) Interference pattern will disappear.

(C) There will be a central bright white fringe surrounded by a few coloured fringes.

(D) All bright fringes will be of equal width.

Question 46.

A logic circuit provides the output Y as per the following truth table:

The expression for the output Y is :

[4 Marks]

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

(A) B

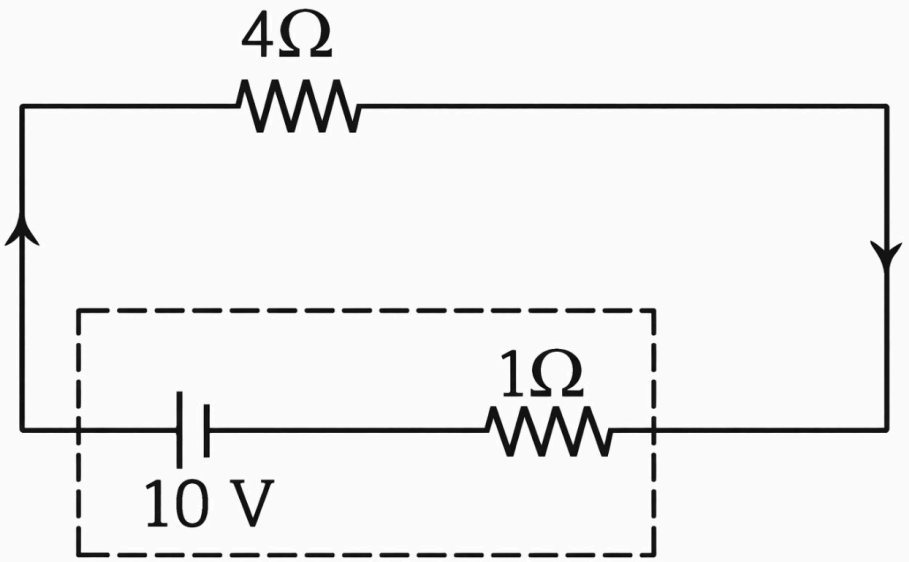
(B) $\overline{B}$

(C) A.B+$\overline{A}$

(D) A.$\overline{B}$+$\overline{A}$

Question 47. The terminal voltage of the battery, whose emf is 10 V and internal resistance 1 Ω, when connected through an external resistance of 4 Ω as shown in the figure, is:

[4 Marks]



(A) 4V

(B) 6V

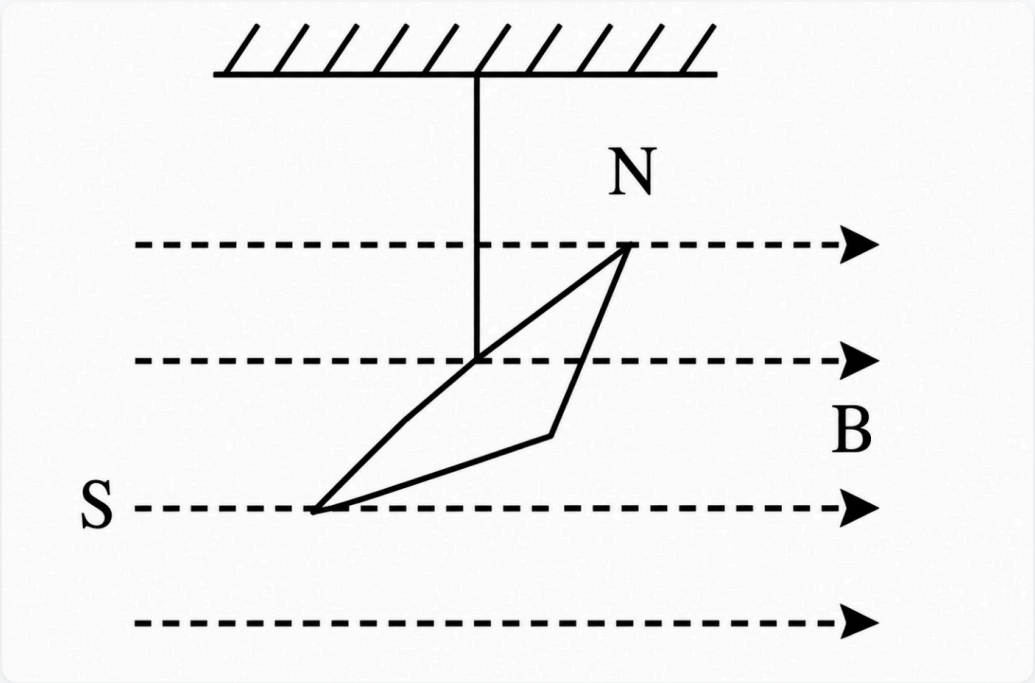
(C) 8V

(D) 10V

Question 48.

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 9.8×10^{-6} kg m². If the magnitude of magnetic moment of the needle is 1×10^{-5} A m², then the value of ' x' is:

[4 Marks]



(A) 5 π^2

(B) 1280 π^2

(C) 128 π^2

(D) 50 π^2

Question 49.

A wire of length 'l' and resistance 100 Ω 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:

[4 Marks]

(A) 52 Ω

(B) 60 Ω

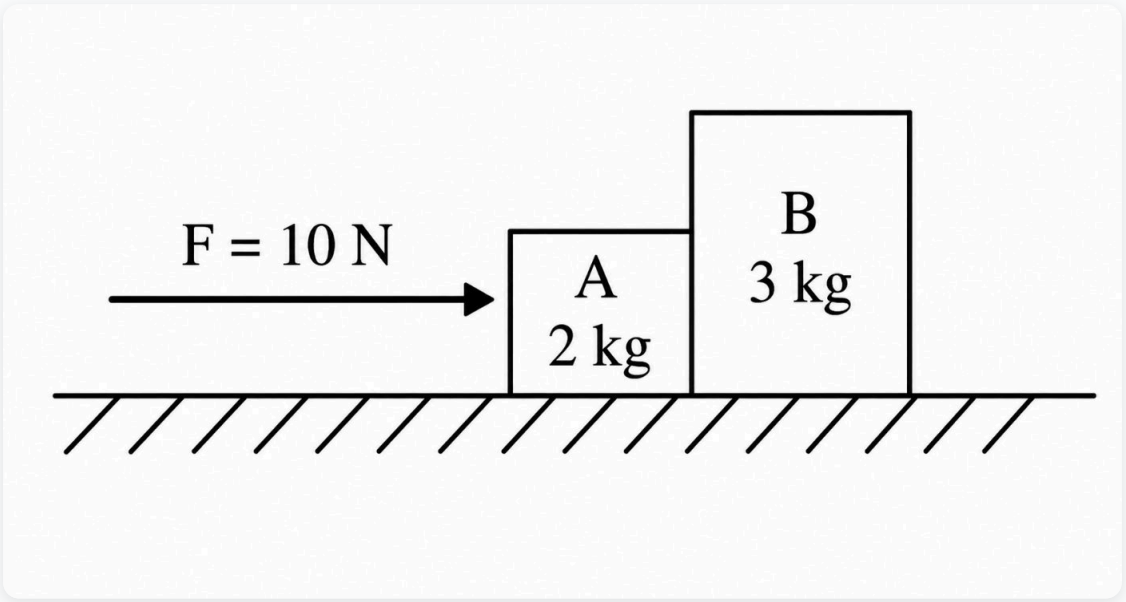
(C) 26 Ω

(D) 55 Ω

Question 50.

A horizontal force 10 N is applied to a block A as shown in the 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:

[4 Marks]



(A) 10N

(B) 6N

(C) Zero

(D) 4N

Question 51. 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 as $4\pi \times 10^{-7}$ SI units):

[4 Marks]

(A) 44 mT

(B) 4.4 T

(C) 4.4 mT

(D) 44 T

Question 52. In an ideal transformer, the turns ratio is $N_P/N_S = 1/2$ The ratio $V_S : V_P$ is equal to (the symbols carry their usual meaning):

[4 Marks]

(A) 1:2

(B) 2:1

(C) 1:1

(D) 1:4

Question 53.

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 emit their characteristic spectrum.

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

[4 Marks]

(A) Statement I is correct but Statement II is incorrect

(B) Statement I is incorrect but Statement II is correct

(C) Both Statement I and Statement IT are incorrect

(D) Both Statement I and Statement II are correct

Question 54.

A bob is whirled in a horizontal plane by means of a string with an initial speed of ω rpm. If the tension in the string is T. If speed becomes 2ω while keeping the same radius, the tension in the string becomes:

[4 Marks]

(A) T

(B) T/4

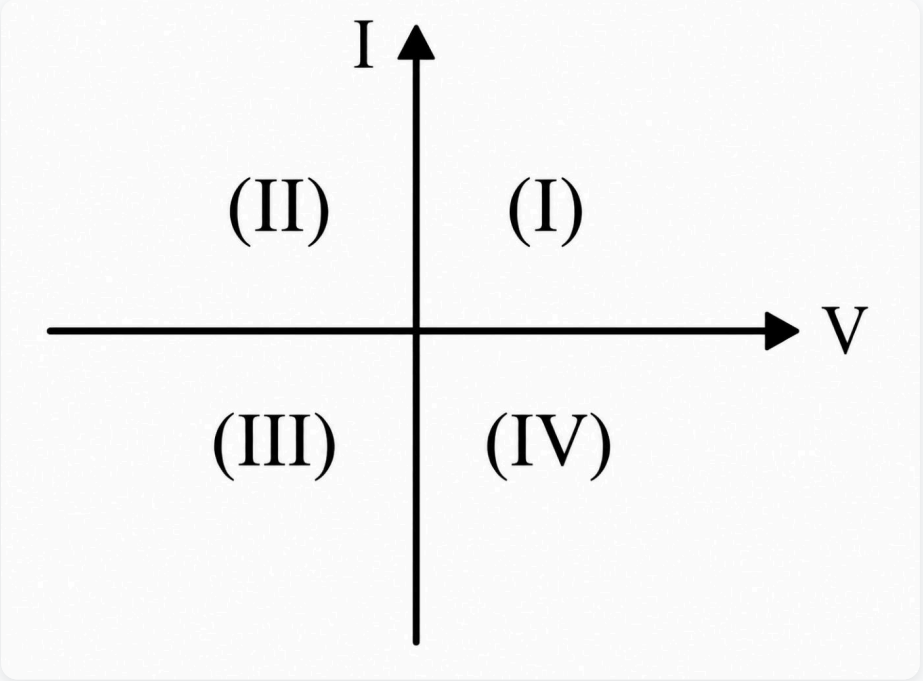
(C) √ 2T

(D) 4T

Question 55.

Consider the following statements A and B and identify the correct answer: A. For a solar cell, the I–V characteristics lies in the IV quadrant of the given graph. B. In a reverse biased pn junction diode, the current measured in μA is due to majority charge carriers.

[4 Marks]



(A) Both A and B are incorrect

(B) A is correct but B is incorrect

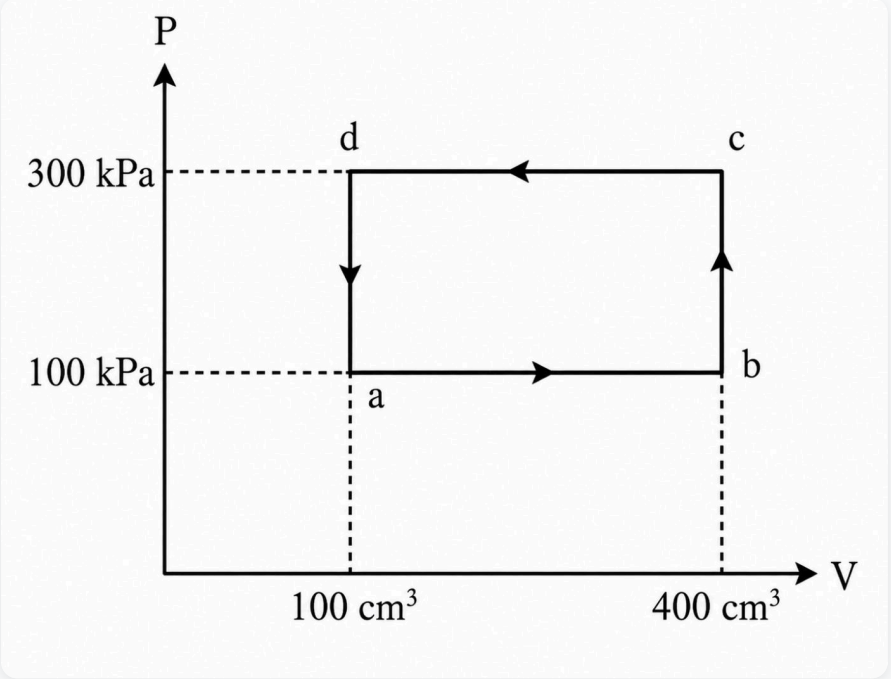
(C) Both A and B are correct

(D) A is incorrect but B is correct

Question 56.

A thermodynamic system is taken through the cycle abcda. The work done by the gas along the path be is:

[4 Marks]



(A) - 60 J

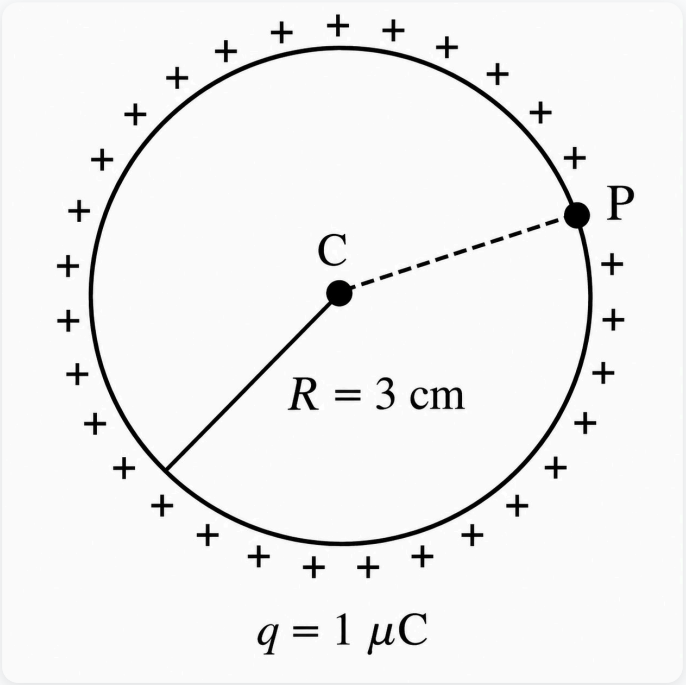
(B) -90 J

(C) Zero

(D) 30 J

Question 57. 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: (Take $1/4\pi\varepsilon_0 = 9 \times 10^9$ SI units)

[4 Marks]



(A) 3×10^5

(B) 1×10^5

(C) 0.5×10^5

(D) zero

Question 58. 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:

[4 Marks]

(A) 8.5 cm

(B) 20.7 cm

(C) 72.0 cm

(D) 17.5 cm

Question 59. A particle moving with uniform speed in a circular path maintains:

[4 Marks]

(A) Constant velocity

(B) Constant acceleration

(C) Constant velocity but varying acceleration

(D) Varying velocity and varying acceleration

Question 60.

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, $p= h\nu/c$

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:

[4 Marks]

(A) A, C and D only

(B) A and B only

(C) A, B, C and D only

(D) A, B, D and E only

Question 61. 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):

[4 Marks]

(A) 10

(B) 5

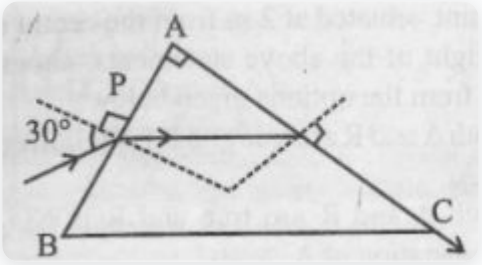
(C) 6

(D) 7

Question 62.

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

[4 Marks]



(A) √5/4

(B) √3/2

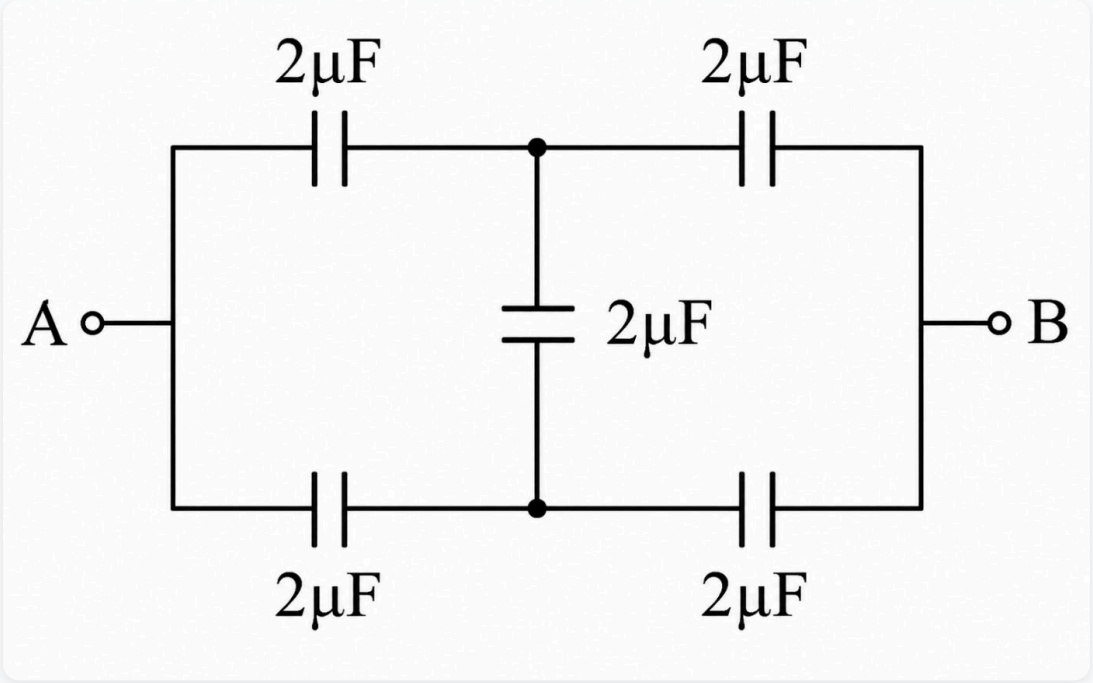
(C) √5/2

(D) √3/4

Question 63.

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

[4 Marks]



(A) 4 μF

(B) 1 μF

(C) 0.5 μF

(D) 2 μF

Question 64.

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

[4 Marks]

(A) Strain and arc

(B) angular speed and stress

(C) Stress and angle

(D) Strain and angle

Question 65.

The maximum elongation of a steel wire of 1 m length if the elastic limit of steel and its Young's modulus, respectively, are 8×10^{8} N m^{-2} and 2×10^{11} N m^{-2}, is:

[4 Marks]

(A) 8 mm

(B) 40 mm

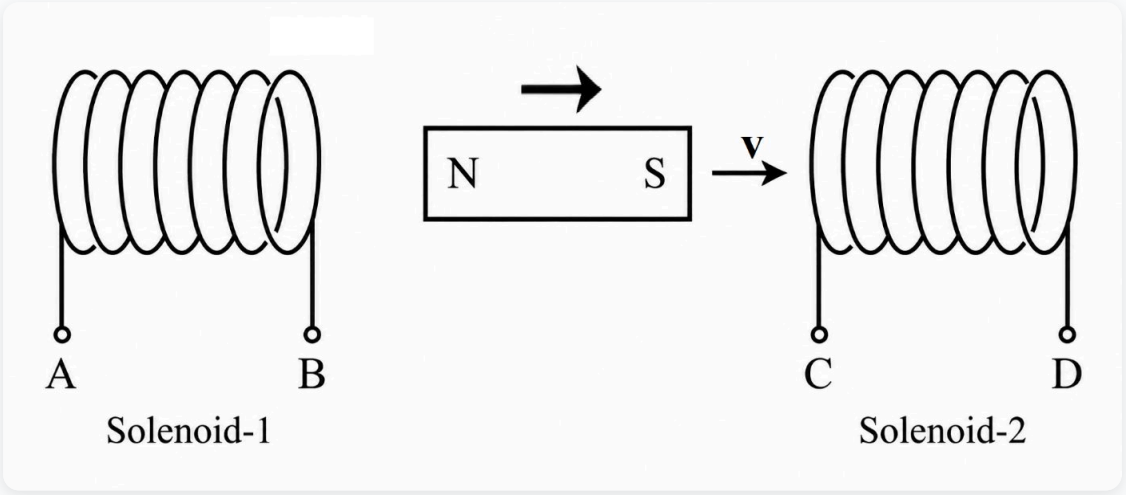
(C) 0.4 mm

(D) 4 mm

Question 66.

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:

[4 Marks]



(A) AB and CD

(B) BA and DC

(C) BA and CD

(D) AB and DC

Question 67.

The mass of a planet is 1/10that of the Earth and its diameter is half that of the Earth. The acceleration due to gravity on that planet is:

[4 Marks]

(A) 9.8 m s^{-2}

(B) 3.92 m s^{-2}

(C) 4.9 m s^{-2}

(D) 19.6 m s^{-2}

Question 68.

Match List I with List II.Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 69.

An unpolarised light beam strikes a glass surface at Brewster's angle. Then

[4 Marks]

(A) The reflected light will be completely polarised but the refracted light will be partially polarised.

(B) Both the reflected and refracted light will be completely polarised.

(C) The reflected light will be partially polarised.

(D) The refracted light will be completely polarised.

Question 70.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List-I (Material)	List-II (Susceptibility (χ))
A. Diamagnetic	I. $\chi = 0$
B. Ferromagnetic	II. $0 > \chi \geq -1$
C. Paramagnetic	III. $\chi >> 1$
D. Not-magnetic	IV. $0 < \chi < \varepsilon$ (ε small positive number)

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

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

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

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

Question 71.

Two bodies A and B of same mass undergo completely 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:

[4 Marks]

(A) 4:1

(B) 1:4

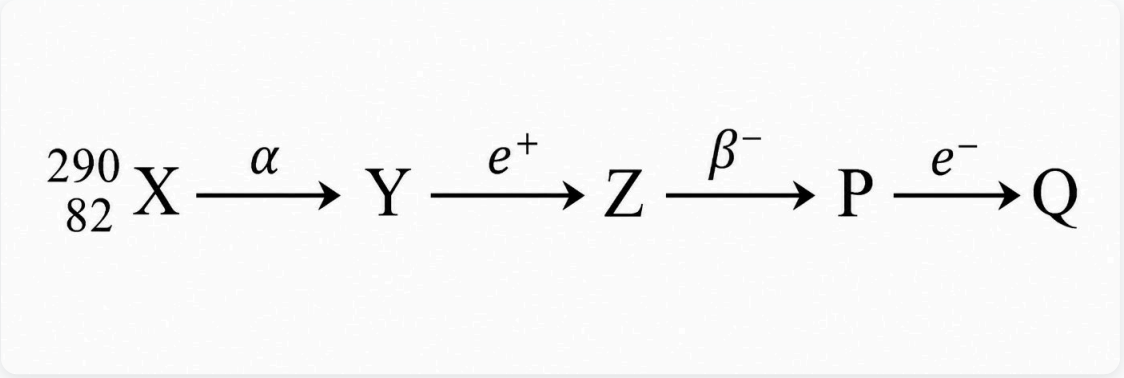
(C) 2:1

(D) 1:2

Question 72.

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

[4 Marks]



(A) 288, 82

(B) 280, 81

(C) 286, 80

(D) 286, 81

Question 73.

If x = 5sin (πt +π/3) m represents the motion of a particle executing simple harmonic motion, the amplitude and time period of motion, respectively, are

[4 Marks]

(A) 5 m, 1 s

(B) 5 m, 2 s

(C) 5 cm, 1 s

(D) 5 cm, 2 s

Question 74.

A thin flat circular disc of radius 4.5 cm is placed gently over the surface of water. If surface tension of water is 0.07 N m^{-1}, then the excess force required to take it away from the surface is:

[4 Marks]

(A) 99 N

(B) 1.98 mN

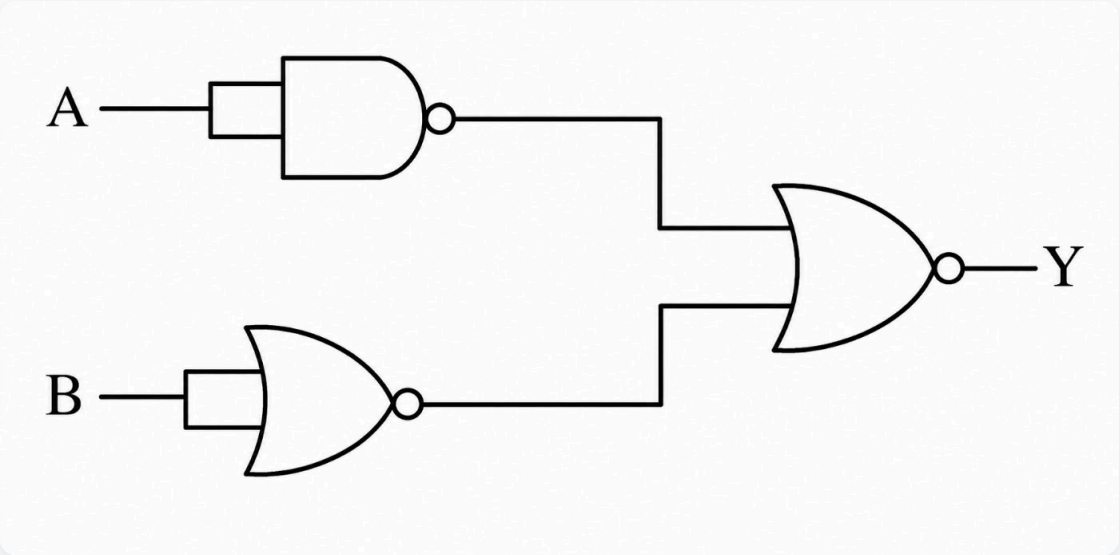
(C) 198 N

(D) 19.8 mN

Question 75.

The output (Y) of the given logic gate is similar to the output of an/a

[4 Marks]



(A) OR gate

(B) AND gate

(C) NOR gate

(D) NAND gate

Question 76.

Assertion A: The potential (V) at any axial point, at 2 m distance (r) from the centre of the dipole of dipole moment vector □□ of magnitude 4×10^{-6} Cm, is $\pm 9 \times 10^{3}$V.

(Take $1/4\pi\varepsilon_0 = 9 \times 10^{9}$ SI units)

Reason R: $V = \pm 2P/4\pi\varepsilon_0 r^2$, where r is the distance of any 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:

[4 Marks]

(A) A is false but R is true.

(B) A is true but R is false.

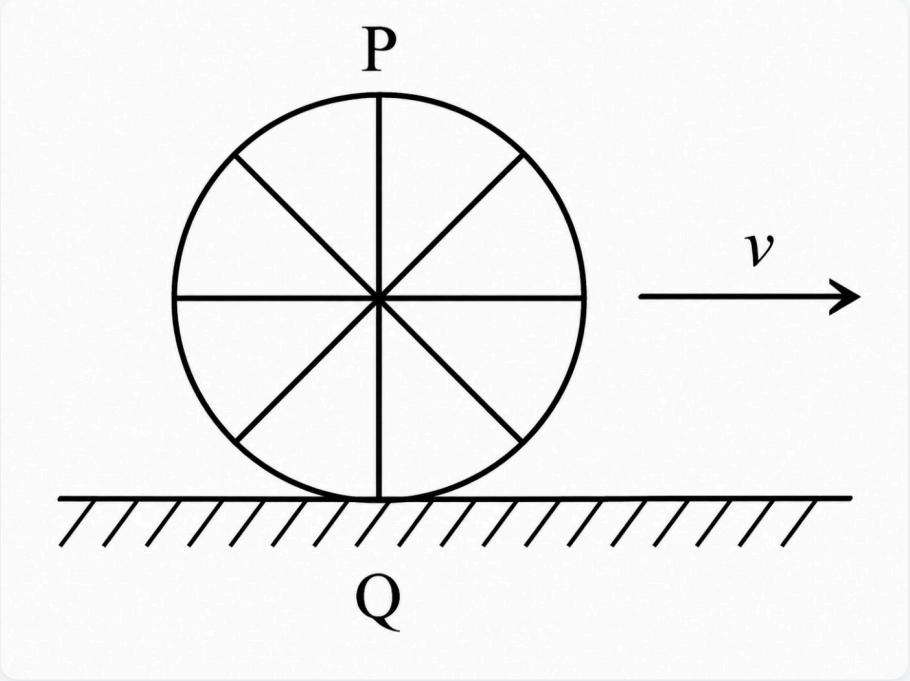
(C) Both A and R are true and R is the correct explanation of A.

(D) Both A and R are true and R is NOT the correct explanation of A.

Question 77.

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 on the wheel, respectively)?

[4 Marks]



(A) Both the points P and Q move with equal speed

(B) Point P has zero speed

(C) Point P moves faster than point Q

(D) Point P moves slower than point Q

Question 78.

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:

[4 Marks]

(A) Displacement current of magnitude equal to I flows in the same direction as I

(B) Displacement current of magnitude equal to I flows in a direction opposite to that of I

(C) Displacement current of magnitude greater than I flows but can be in any direction

(D) There is no current

Question 79. The property which is not of an electromagnetic wave travelling in free space is that:

[4 Marks]

(A) They are transverse in nature

(B) The energy density in electric field is equal to energy density magnetic field

(C) They travel with a speed equal to $1/\sqrt{\mu_0\varepsilon_0}$

(D) They originate from charges moving with uniform speed

Question 80.

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:

[4 Marks]

(A) 17

(B) 32

(C) 28

(D) 34

Question 81. Two heaters A and B have power rating of 1 kW and 2 kW, respectively. Those 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:

[4 Marks]

(A) 1:1

(B) 2:9

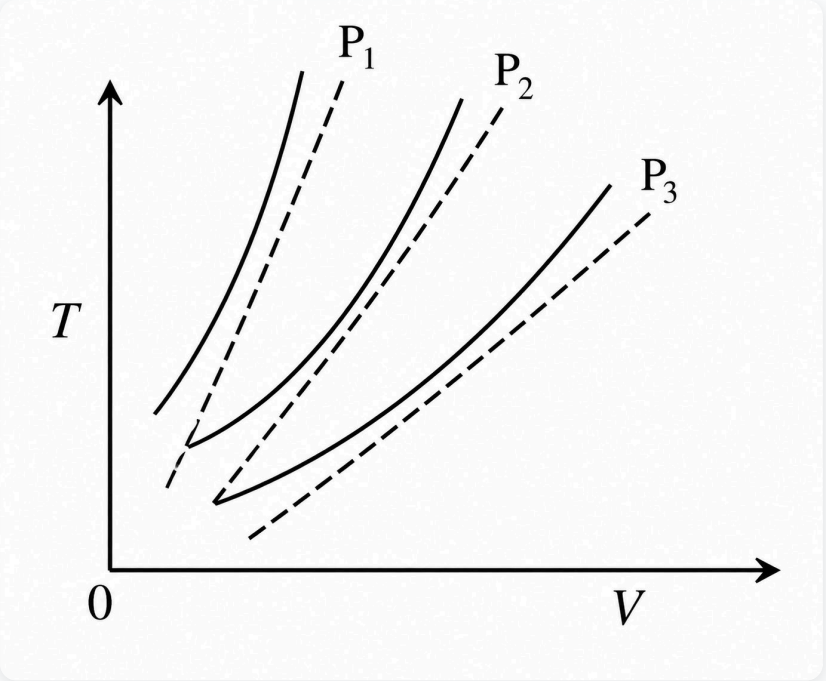
(C) 1:2

(D) 2:3

Question 82.

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' law represented as dotted lines. Then the correct relation is:

[4 Marks]



(A) $P_2 > P_1 > P_3$

(B) $P_1 > P_2 > P_3$

(C) $P_1 > P_3 > P_2$

(D) $P_3 > P_2 > P_1$

Question 83.

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 x/2 times its original time period. Then the value of x is:

[4 Marks]

(A) 2√3

(B) 4

(C) √3

(D) √2

Question 84. 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:

[4 Marks]

(A) 5GmM/6R

(B) 2GmM/3R

(C) GmM/2R

(D) GmM/3R

Question 85.

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 uniform velocity if it is conducting.

D. move the sheet away from the pole with uniform velocity if it is both, non-conducting and non-polar. Choose the correct statement(s) from the options given below:

[4 Marks]

(A) A, C and D only

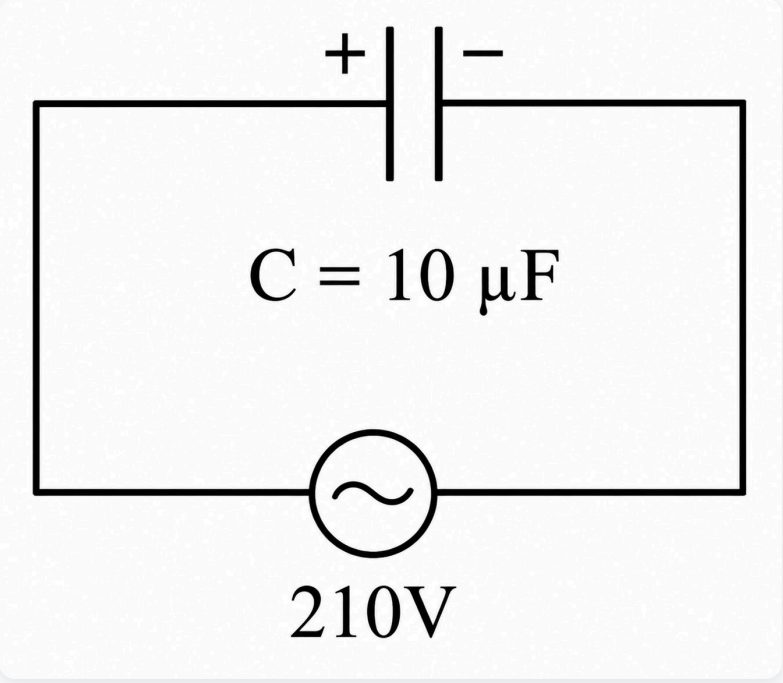
(B) C only

(C) A and C only

(D) B and D only

Question 86. A 10 μF capacitor is connected to a 210 V, 50 Hz source as shown in the figure. The peak current in the circuit is nearly (π = 3.14):

[4 Marks]



(A) 0.58 A

(B) 0.93 A

(C) 1.20 A

(D) 0.35 A

Question 87.

A metallic bar of Young's modulus 0.5×10^{11} N m^{-2} and coefficient of linear thermal expansion $10^{-5}°C^{-1}$, length 1 m and area of cross-section 10^{-3} m^2 is heated from 0°C to 100°C without expansion or bending. The compressive force developed in it is:

[4 Marks]

(A) 2×10^3 N

(B) 5×10^3 N

(C) 100×10^3 N

(D) 50×10^3 N

Question 88.

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 :

[4 Marks]

(A) 2M

(B) M/√3

(C) M

(D) M/2

Question 89.

If the plates of a parallel plate capacitor connected to a battery are moved close to each other, then

A. the charge stored in it, increases.

B. the energy stored in it, decreases.

C. its capacitance increases.

D. the ratio of charge to its potential remains the same.

E. the product of charge and voltage increases.

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) A, B and E only

(B) A, C and E only

(C) A, B and C only

(D) B, D and E only

Question 90.

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:

[4 Marks]

(A) $\alpha\beta/t$

(B) $\alpha\beta t$

(C) $\alpha t/\beta$

(D) $\beta t/\alpha$

Question 91. Lecithin, a small molecular weight organic compound found in living tissues, is an example of:

[4 Marks]

(A) Amino acids

(B) Phospholipids

(C) Glycerides

(D) Carbohydrates

Question 92. How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle?

[4 Marks]

(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

Question 93.

Hindi II always cuts DNA molecules at a particular point called recognition sequence and it consists of:

[4 Marks]

(A) 10 bp

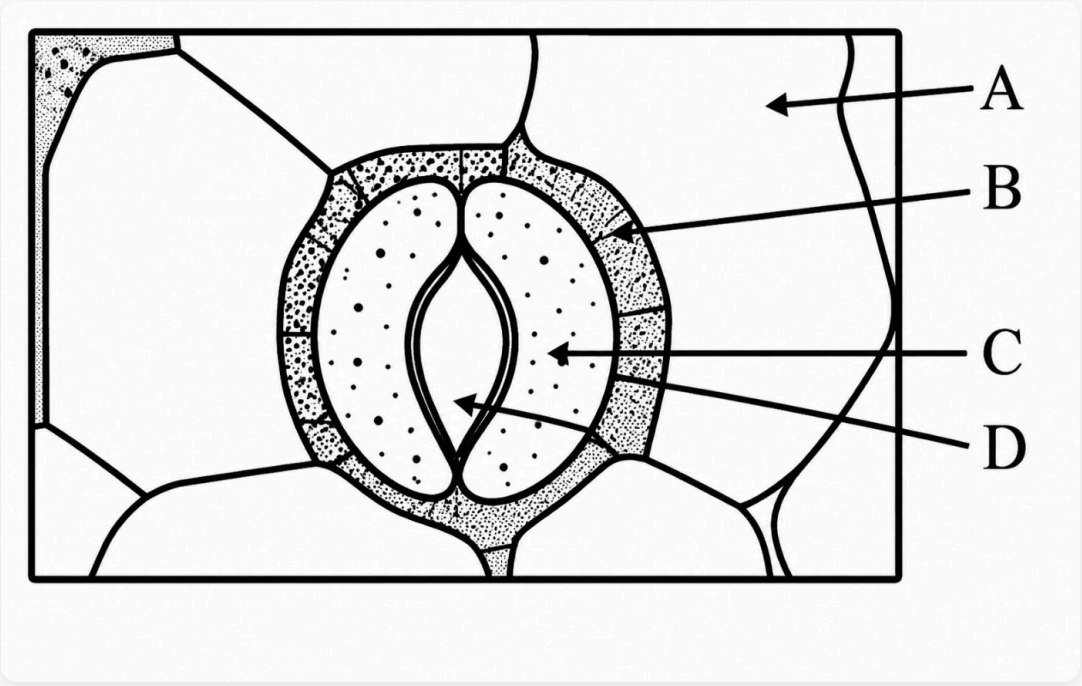
(B) 4 bp

(C) 6 bp

(D) 8 bp

Question 94. In the given figure, which component has thin outer walls and highly thickened inner walls?

[4 Marks]



(A) C

(B) D

(C) B

(D) A

Question 95. The cofactor of the enzyme carboxypeptidase is:

[4 Marks]

(A) Niacin

(B) Zinc

(C) Flavin

(D) Haem

Question 96. The capacity to generate a whole plant from any cell of the plant is called:

[4 Marks]

(A) Totipotency

(B) Micropropagation

(C) Differentiation

(D) Somatic hybridization

Question 97.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 98.

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

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

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

[4 Marks]

(A) Both Statement I and Statement II are false

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are true

(D) Statement I is false but Statement II is true

Question 99. Which of the following is an example of actinomorphic flower?

[4 Marks]

(A) Datura

(B) Cassia

(C) Pisum

(D) Sesbania

Question 100. 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;

[4 Marks]

(A) in-situ conservation

(B) Biodiversity conservation

(C) Semi-conservative method

(D) Sustainable development

Question 101.

Identify the set of correct statement: A. The flowers of Vallisneria are colourful and produce nectar.

B. The flowers of waterlily 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 ribbon like.

E. In some hydrophytes, the pollen grains are carried passively inside water.

Choose the correct answer from the options given below.

[4 Marks]

(A) B, C, D and E only

(B) A, C, D and E only

(C) C, D and E only

(D) A, B, C and D only

Question 102. The lactose present in the growth medium of bacteria is transported to the cell by the action of

[4 Marks]

(A) Beta-galactosidase

(B) Acetylase

(C) Polymerase

(D) Permease

Question 103.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 104.

The equation of Verhulst-Pearl logistic growth is dN/dt = rN[K-N/K]. From this equation, K indicates:

[4 Marks]

(A) Population density

(B) Carrying capacity

(C) Intrinsic rate of natural increase

(D) Biotic potential

Question 105. Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin

[4 Marks]

(A) promotes apical dominance.

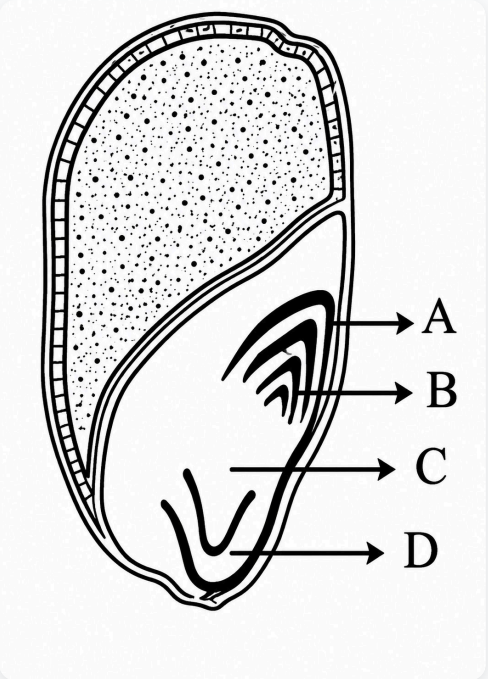
(B) promotes abscission of mature leaves only.

(C) does not affect mature monocotyledonous plants.

(D) can help in cell division in grasses, to produce growth.

Question 106. Identify the part of the seed from the given figure which is destined to form root when the seed germinates.

[4 Marks]



(A) B

(B) A

(C) C

(D) D

Question 107.

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:

[4 Marks]

(A) Statement I is false but Statement II is true

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

Question 108.

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:

[4 Marks]

(A) A, B and D only

(B) A, B and E only

(C) A, B, C and D only

(D) A, C and D only

Question 109. Which one of the following is not a criterion for classification of fungi?

[4 Marks]

(A) Morphology of mycelium

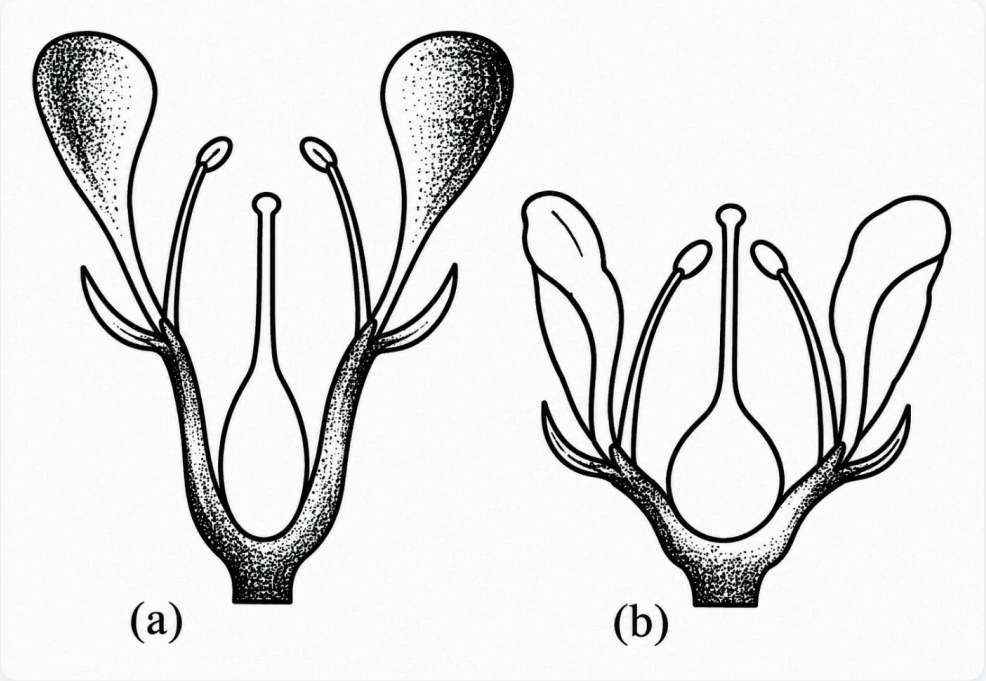
(B) Mode of nutrition

(C) Mode of spore formation

(D) Fruiting body

Question 110. Identify the type of flowers based on the position of calyx, corolla and androecium with respect to the ovary from the given figures (a) and (b)

[4 Marks]



(A) (a) Epigynous; (b) Hypogynous

(B) (a) Hypogynous; (b) Epigynous

(C) (a) Perigynous; (b) Epigynous

(D) (a) Perigynous; (b) Perigynous

Question 111. List of endangered species was released by-

[4 Marks]

(A) GEAC

(B) WWF

(C) FOAM

(D) IUCN

Question 112.

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.

Choose the correct answer from the options given below:

[4 Marks]

(A) A and E only

(B) D and E only

(C) A and B only

(D) B and C only

Question 113. Wich 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, 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:

[4 Marks]

(A) A, B and C only

(B) A, C, D and E only

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

(D) B, C and D only

Question 114. Inhibition of Succinic dehydrogenase enzyme by malonate is a classical example of:

[4 Marks]

(A) Cofactor inhibition

(B) Competitive inhibition

(C) Feedback inhibition

(D) Enzyme activation

Question 115. Formation of interfascicular cambium from. fully developed parenchyma cells is an example for

[4 Marks]

(A) Differentiation

(B) Redifferentiation

(C) Dedifferentiation

(D) Maturation

Question 116. Spindle fibers attach to kinetochores of chromosomes during

[4 Marks]

(A) Prophase

(B) Metaphase

(C) Telophase

(D) Anaphase

Question 117.

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.

[4 Marks]

(A) A, B and D only

(B) A, B and E only

(C) A, C, D and E only

(D) A and B only

Question 118.

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:

[4 Marks]

(A) Statement I is true but Statement II is false

(B) Statement I is false but Statement II is true

(C) Both Statement I and Statement II are false

(D) Both Statement I and Statement II are true

Question 119. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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 storing nutrients

(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

Question 120. Bulliform cells are responsible for

[4 Marks]

(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.

Question 121.

A pink flowered Snapdragon plant was crossed with a red flowered Snapdragon plant. What type of phenotype/s is/are expected in the progeny?

[4 Marks]

(A) Red, Pink as well as white flowered plants

(B) Only pink flowered plants

(C) Red flowered as well as pink flowered plants

(D) Only red flowered plants

Question 122. A transcription unit in DNA is defined primarily by the three regions in DNA and these are with respect to upstream and down stream end;

[4 Marks]

(A) Repressor, Operator gene, Structural gene

(B) Structural gene, Transposons, Operator gene

(C) Inducer, Repressor, Structural gene

(D) Promotor, Structural gene, Terminator

Question 123. In a plant, black seed color (BB/Bb) is dominant over white seed color (bb). In order to find out the genotype of the black seed plant, with which of the following genotype will be cross it?

[4 Marks]

(A) BB

(B) bb

(C) Bb

(D) BB/Bb

Question 124.

Which of the following are required for the dark reaction of photosynthesis?

A. Light

B. Chlorophyll

C. CO_2 D. ATP

E. NADPH

Choose the correct answer from the options given below:

[4 Marks]

(A) D and E only

(B) C, D and E only

(C) B, C and D only

(D) A, B and C only

Question 125.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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

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

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

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

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

Question 126. The DNA present in chloroplast is:

[4 Marks]

(A) Linear, double stranded

(B) Circular, double stranded

(C) Linear, single stranded

(D) Circular, single stranded

Question 127. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	Charles Darwin	I.	Long term ecosystem experiment using out door plots
B.	Alexander von Humboldt	II.	Global species diversity at about 7 million
C.	Paul Ehrlich	III.	Rivet popper hypothesis
D.	David Tilman	IV.	Developed the theory of natural selection

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

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

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

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

Question 128.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List I		List II	
A.	Rose	I.	Twisted aestivation
B.	Pea	II.	Pentagonous flower
C.	Cotton	III.	Drupe
D.	Mango	IV.	Marginal placentation

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

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

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

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

Question 129. Which of the following statement is correct regarding the process of replication in E. coli?

[4 Marks]

(A) The DNA dependent DNA polymerase catalyses polymerization in one direction, that is 3′ → 5′

(B) The DNA dependent RNA polymerase catalyses polymerization in one direction, that is 5′ → 3′

(C) The DNA dependent DNA polymerase catalyses polymerization in 5′ → 3′ as well as 3′ → 5′ direction

(D) The DNA dependent DNA polymerase catalyses polymerization in 5′ → 3′ direction only.

Question 130.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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

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

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

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

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

Question 131.

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 only.

C. Stored food is in the form of carbohydrates which is either mannitol or laminarin.

D. The major pigments found are chlorophyll a, c and carotenoids and xanthophyll.

E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin. Choose the correct answer from the options given below:

[4 Marks]

(A) A, B, C and E only

(B) A, C, D and E only

(C) B, C, D and E only

(D) A, B, C and D only

Question 132.

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

[4 Marks]

(A) 10x (kcal m^{-2} yr^{-1})

(B) 100x/3X (kcal m^{-2} yr^{-1})

(C) x (kcal m^{-2} yr^{-1})

(D) x/10 (kcal m^{-2} yr^{-1})

Question 133.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

(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

Question 134. Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate.

[4 Marks]

(A) Succinic acid → Malic acid

(B) Malic acid → Oxaloacetic acid

(C) Succinyl-CoA → Succinic acid

(D) Isocitrate → α-ketoglutaric acid

Question 135.

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 very little photorespiration while bundle sheath cells do not show photorespiration.

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

[4 Marks]

(A) Statement 1is false but Statement II is true

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

Question 136. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

(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

Question 137. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 138.

Which of the following are fused in somatic hybridization involving two varieties of plants?

[4 Marks]

(A) Callus

(B) Somatic embryos

(C) Pollens

(D) Protoplasts

Question 139. Spraying sugarcane crop with which of the following plant growth regulators, increases the length of stem, thus, increasing the yield?

[4 Marks]

(A) Auxin

(B) Gibberellin

(C) Cytokinin

(D) Abscisic acid

Question 140.

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

[4 Marks]

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

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

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

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

Question 141. In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on

[4 Marks]

(A) 5^{th} segment

(B) 10^{th} segment

(C) 11^{th} segment

(D) 8^{th} and 9^{th} segment

Question 142.

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

[4 Marks]

(A) Divergent evolution

(B) Convergent evolution

(C) Natural selection

(D) Adaptive radiation

Question 143. Which of the following is not a component of Fallopian tube?

[4 Marks]

(A) Isthmus

(B) Uterine fundus

(C) Ampulla

(D) Infundibulum

Question 144.

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:

[4 Marks]

(A) A-D-C-B

(B) C-B-D-A

(C) B-A-D-C

(D) D-A-C-B

Question 145. Which of the following is not a steroid hormone?

[4 Marks]

(A) Cortisol

(B) Testosterone

(C) Progesterone

(D) Glucagon

Question 146. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

Question 147.

Following are the stages of cell division :

A. Gap 2 phase

B. Cytokinesis

C. Synthesisphase

D. Karyokinesis

E. Gap I phase

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

[4 Marks]

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

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

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

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

Question 148. Which one of the following factors will not affect the Hardy-Weinberg equilibrium?

[4 Marks]

(A) Genetic recombination

(B) Genetic drift

(C) Gene migration

(D) Constant gene pool

Question 149.

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:

[4 Marks]

(A) C, D & E only

(B) B, C & E only

(C) A, B & D only

(D) B & E only

Question 150. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 151. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Expiratory capacity	I.	Expiratory reserve volume + Tidal volume + Inspiratory reserve 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

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

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

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

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

Question 152. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 153.

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 :

[4 Marks]

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

(B) A is false but R is true

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

(D) A is true but R is false

Question 154. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Pleurorhrachia	I.	Mollusca
B.	Radula	II.	Ctenophora
C.	Stomochord	III.	Osteichthyes
D.	Air bladder	IV.	Hemichordata

(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

Question 155. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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

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

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

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

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

Question 156. The “Ti plasmid” of Agrobacterium tumefaciens stands for

[4 Marks]

(A) Tumor independent plasmid

(B) Tumor inducing plasmid

(C) Tumour inhibiting plasmid

(D) Temperature independent plasmid

Question 157.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	List I		List II
A.	Cocaine	I.	Effective sedative in surgery
B.	Heroine	II.	Erythroxylum
C.	Morphine	III.	Erythroxylum
D.	Marijuana	IV.	*Papaver somniferum*

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

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

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

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

Question 158. Which one is the correct product of DNA dependent RNA polymerase to the given template: 3′ TACATGGCAAATATCCATTCA 5′

[4 Marks]

(A) 5′ AUGUACCGUUUAUAGGUAAGU 3′

(B) 5′ AUGUAAAGUUUAUAGGUAAGU 3′

(C) 5′ AUGUACCGUUUAUAGGGAAGU 3′

(D) 5′ ATGTACCGTTTATAGGTAAGT 3′

Question 159. Which of the following is not a natural/traditional contraceptive method?

[4 Marks]

(A) Coitus interruptus

(B) Lactational amenorrhea

(C) Periodic abstinence

(D) Vaults

Question 160. Which of the following statements is incorrect?

[4 Marks]

(A) A bio-reactor provides optimal growth conditions for achieving the desired product

(B) Bio-reactors are used to produce small scale bacterial cultures

(C) Most commonly used bio-reactors are of stirring type

(D) Bio-reactors have an agitator system, an oxygen delivery system foam control system

Question 161.

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 bringing 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:

[4 Marks]

(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 but R is NOT the correct explanation of A

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

Question 162. Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli?

[4 Marks]

(A) High pO_2 and High pCO_2

(B) High pO_2 and Lesser H^+ concentration

(C) Low pCO_2 and High H^+ concentration

(D) Low pCO_2 and High temperature

Question 163. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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.	Neurosecretory cells

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

Question 164.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List-I		List-II	
A.	Lipase	I.	Peptide bond
B.	Nuclease	II.	Ester bond
C.	Proteases	III.	Glycosidic bond
D.	Amylase	IV.	Phosphodiester bond

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

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

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

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

Question 165.

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 given below:

[4 Marks]

(A) D only

(B) C only

(C) B only

(D) A only

Question 166. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	LIST I		LIST - II
A.	Non-medicated IUD	I.	Multiload 375
B.	Copper releasing IUD	II.	Progestogens
C.	Hormone releasing IUD	III.	Lipper loop
D.	Implants	IV.	LNG-20

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

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

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

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

Question 167. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 168.

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

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

In the light of the above statements,

choose the correct answer from the options given below:

[4 Marks]

(A) Statement I is false but Statement II is true

(B) Statement I is true but Statement II is false

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

Question 169. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 170.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 171. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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

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

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

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

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

Question 172.

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 the light of the above above statements,

choose the correct answer from the options given below :

[4 Marks]

(A) Statement I is true but Statement II is false

(B) Statement I is false but Statement II is true

(C) Both Statement I and Statement II are false

(D) Both Statement I and Statement II are true

Question 173.

Statement I: Gause's competitive exclusion principle states that two closely related species competing for different resources cannot 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 :

[4 Marks]

(A) Statement I is false but Statement II is true.

(B) Statement I is true but Statement II is false.

(C) Both Statement I and Statement II are true.

(D) Both Statement I and Statement II are true.

Question 174. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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 Caeca
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

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

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

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

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

Question 175.

The following are the statements about non-chordates:

A. Pharynx is perforated by gill slits.

B. Notochord is absent.

C. Central nervous system is dorsal.

D. Heart is dorsal if present.

E. Postanal tail is absent.

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) B, C & D only

(B) A & C only

(C) B, D & E only

(D) A, B & D only

Question 176. Choose the correct statement given below regarding juxta medullary nephron.

[4 Marks]

(A) Juxtamedullary nephrons are located in the columns of Bertini.

(B) Renal corpuscle of juxta medullary nephron lies in the outer portion of the renal medulla.

(C) Loop of Henle of juxta medullary nephron runs deep into medulla.

(D) Juxta medullary nephrons outnumber the cortical nephrons.

Question 177.

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:

[4 Marks]

(A) Statement I is incorrect but Statement II is correct.

(B) Statement I is correct but Statement II is incorrect.

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

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

Question 178.

Statement I : Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced. Statement II : Both bone marrow and thymus provide micro environments for the development and maturation of T-lymphocytes. In the light of above statements,

choose the most appropriate answer from the options given below :

[4 Marks]

(A) Statement I s incorrect but Statement II is correct.

(B) Statement I is correct but Statement II is incorrect.

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

(D) Both statement I and II are correct.

Question 179.

Rgarding 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:

[4 Marks]

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

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

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

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

Question 180. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

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

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

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

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

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

Question 181.

Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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

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

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

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

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

Question 182. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

	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

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

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

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

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

Question 183. Match List I with List II. Choose the correct answer from the options given below:

[4 Marks]

List - I		List - II	
A.	Exophthalmic goiter	I.	Excess secretion of cortisol, moon face & hyperglycemia.
B.	Acromegaly	II.	Hypo-secretion of thyroid hormone and stunted growth.
C.	Cushing's syndrome	III.	Hyper secretion of thyroid hormone & protruding eye balls.
D.	Cretinism	IV.	Excessive secretion of growth hormone.

(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

Question 184. 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^Bi / I^Ai / ii B. I^BI^B / I^AI^A / ii C. I^AI^B / iI^A / I^Bi D. I^Ai / I^Bi / I^Ai E. iI^B / ii / I^AI^B Choose the most appropriate answer from the options given below:

[4 Marks]

(A) A only

(B) B only

(C) D & E only

(D) C & B only

Question 185.

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

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

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

[4 Marks]

(A) Statement I is incorrect but Statement II is correct.

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

(C) Statement I is correct but Statement II is incorrect.

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

Question 186.

The graph which shows the variation of $(1/\lambda^2)$ and its A kinetic energy, E is (where λ is de Broglie wavelength of a free particle):

[4 Marks]

(A)



(B)



(C)



(D)

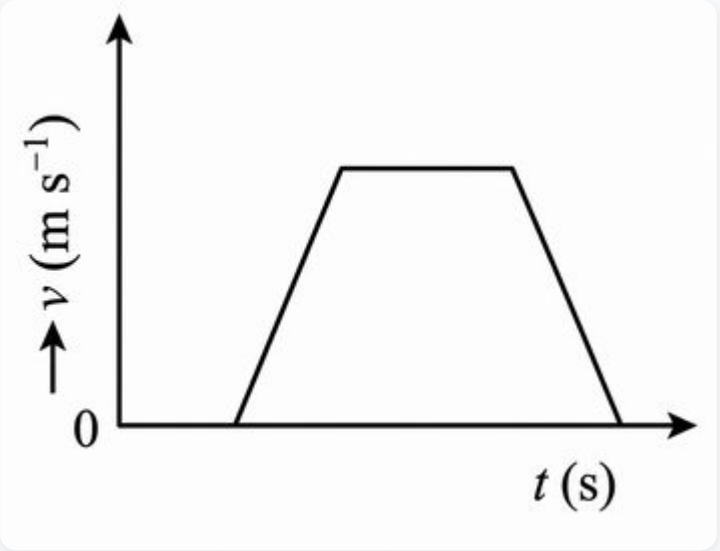


Question 187.

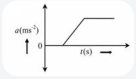
The velocity (v) — time (t) plot of the motion of a body is shown below:

The acceleration (a) — time (t) graph that best suits this motion is :

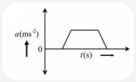
[4 Marks]



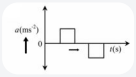
(A)



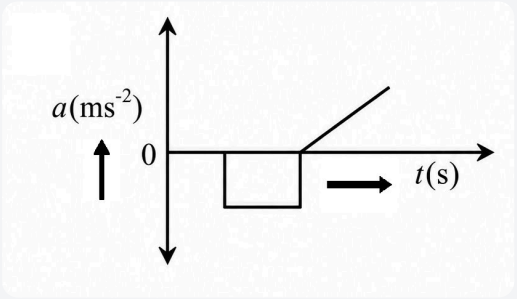
(B)



(C)



(D)



Question 188.

Choose the correct circuit which can achieve the bridge balance.

[4 Marks]

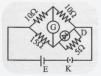
(A)



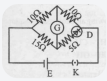
(B)



(C)



(D)

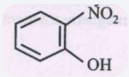


Question 189.

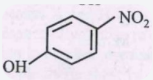
Intramolecular hydrogen bonding is present in

[4 Marks]

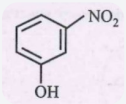
(A)



(B)



(C)



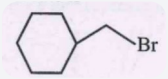
(D) HF

Question 190.

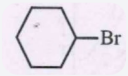
The compound that will undergo S_N1 reaction with the fastest rate is

[4 Marks]

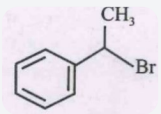
(A)



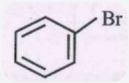
(B)



(C)



(D)



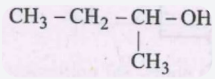
Question 191.

Which one of the following alcoholreacts instantaneously with Lucas reagent?

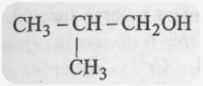
[4 Marks]

(A) $CH_3 – CH_2 – CH_2 – CH_2OH$

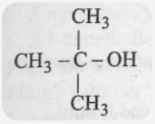
(B)



(C)



(D)

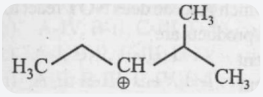


Question 192.

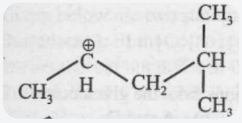
The most stable carbocation among the following is :

[4 Marks]

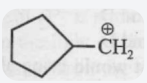
(A)



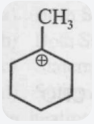
(B)



(C)



(D)

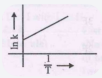


Question 193.

Which plot of In k vs 1/T is consistent with Arrhenius equation?

[4 Marks]

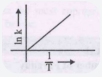
(A)



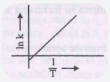
(B)



(C)



(D)

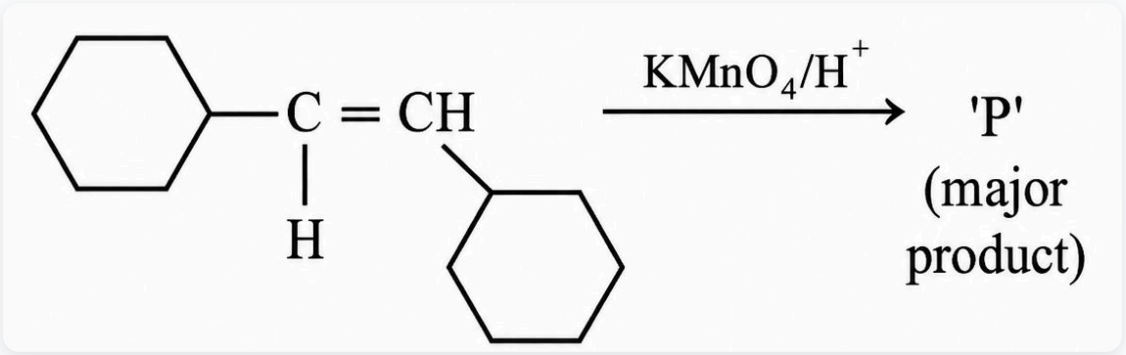


Question 194.

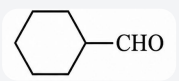
For the given reaction:

'P' is

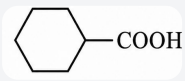
[4 Marks]



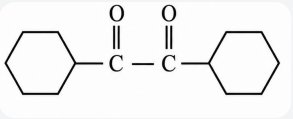
(A)



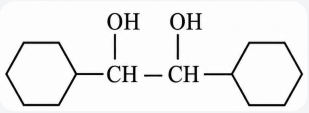
(B)



(C)



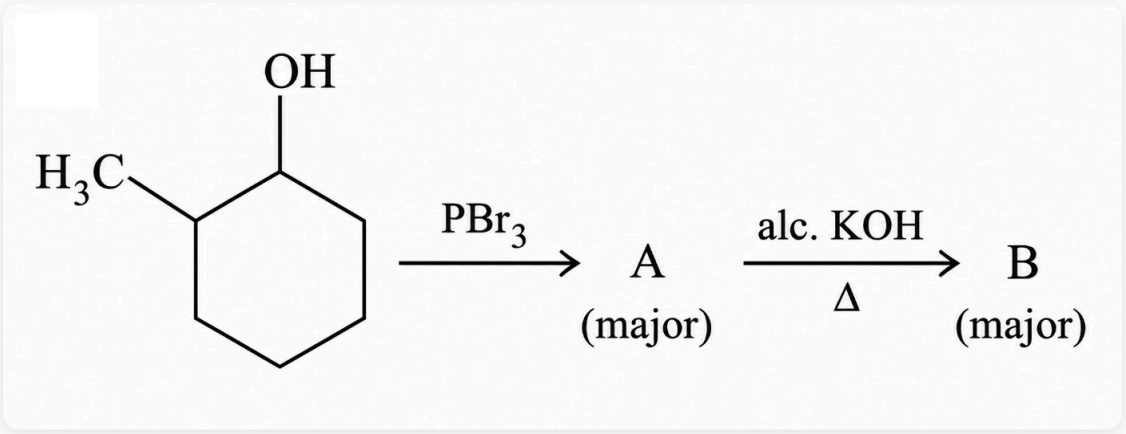
(D)



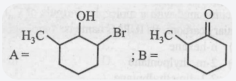
Question 195.

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

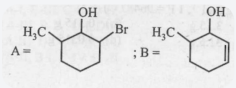
[4 Marks]



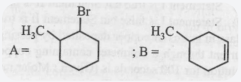
(A)



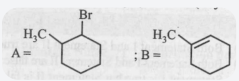
(B)



(C)



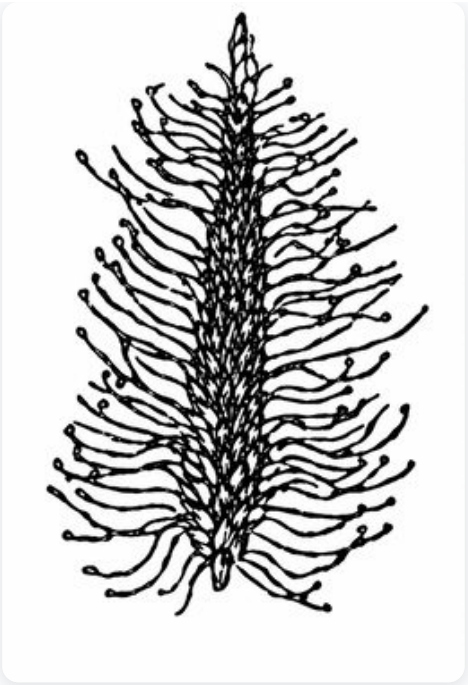
(D)



Question 196.

Identify the correct description about the given figure:

[4 Marks]



(A) Wind pollinated plant inflorescence showing flowers with well exposed stamens.

(B) Water pollinated flowers showing stamens with mucilaginous covering.

(C) Compact inflorescence showing complete autogamy

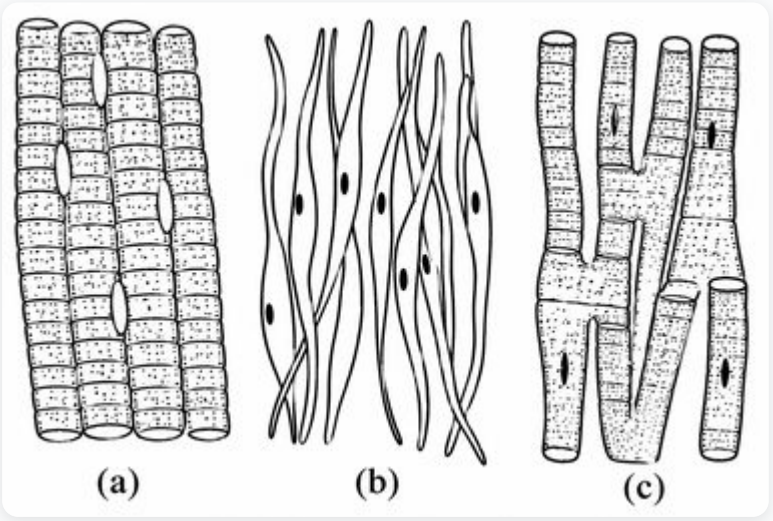
(D) Cleistogamous flowers showing autogamy.

Question 197.

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

Name of muscle/location

[4 Marks]



(A) (a) Smooth – Toes (b) Skeletal – Legs (c) Cardiac – Heart

(B) (a) Skeletal – Biceps (b) Involuntary – Intestine (c) Smooth – Heart

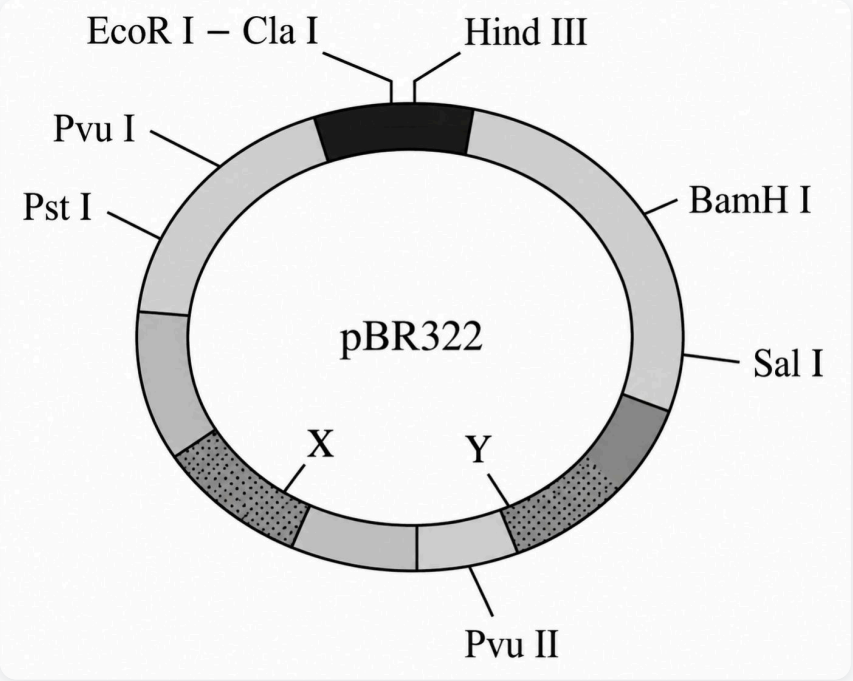
(C) (a) Skeletal – Triceps (b) Smooth – Stomach (c) Cardiac – Heart

(D) (a) Involuntary — Nose tip (b) Skeletal — Bone (c) Cardiac — Heart

Question 198.

The following diagram shows restriction sites in *E. coli* cloning vector pBR322. Find the role of 'X' and 'Y' genes:

[4 Marks]



(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.

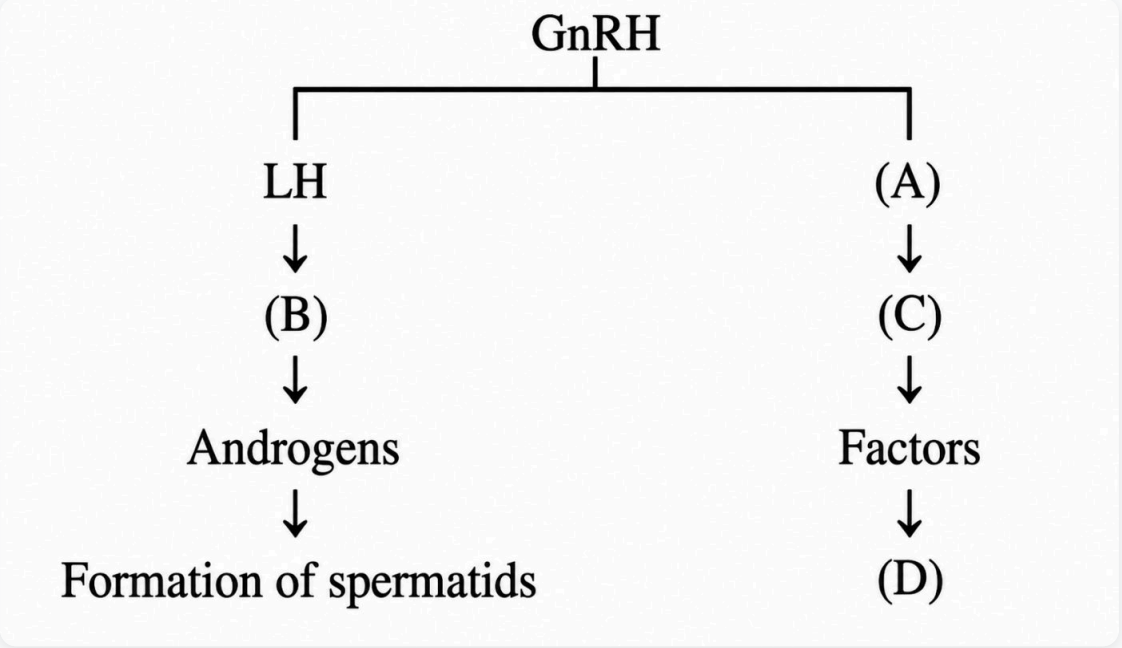
(C) The gene 'X' is responsible for recognition sites and 'Y' is responsible for antibiotic resistance.

(D) The gene 'X' is for protein involved in the replication of plasmid and 'Y' for resistance to antibiotics.

Question 199.

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

[4 Marks]



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

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

(C) ICSH, Leydig cells, Sertoli cells, Spermatogenesis.

(D) FSH, Sertoli cells, Leydig cells, Spermatogenesis.

Question 200.

which one of the following factors will not affect the hardy - weinberg equilibrium?

[4 Marks]

(A) genetic drift

(B) genetic recombination

(C) gene migeation

(D) constant gene pool