NEET-UG EXAMINATION PAPER-2022

(Solved)

Time allowed : 3 hours | Maximum Marks : 794

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.

Two hollow conducting spheres of radii R_1 and R_2 ($R_1 >> R_2$) have equal charges. The potential would be :

[4 Marks]

(A) equal on both the spheres

(B) more on smaller sphere

(C) more on bigger sphere

(D) dependent on the material property of the sphere

Question 2. The angular speed on a fly wheel moving with uniform angular acceleration changes from 1200 rpm to 3120 rpm in 16 seconds. The angular acceleration in rad/s^2? is:

[4 Marks]

(A) 4π

(B) 12π

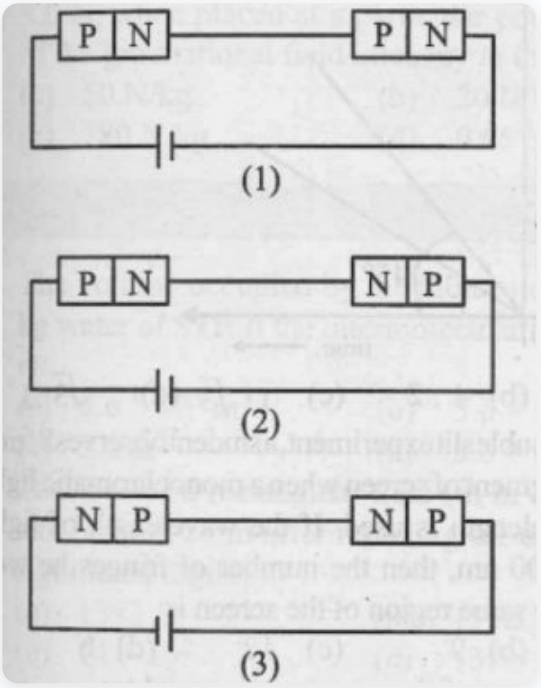
(C) 104π

(D) 2π

Question 3.

In the given circuits (1), (2) and (3), the potential drop across the two p-n junctions are equal in:

[4 Marks]



(A) Circuit (2) only

(B) Both circuits (1) and (3)

(C) Circuit (1) only

(D) Circuit (3) only

Question 4.

Two objects of mass 10 kg and 20 kg respectively are connected to the two ends of a rigid rod of length 10 m with negligible mass. The distance of the center of mass of the system from the 10 kg mass is:

[4 Marks]

(A) 5 m

(B) 20 / 3 m

(C) 10 / 3 m

(D) 10 m

Question 5.

A biconvex lens has radii of curvature, 20 cm each, if the refractive index of the material of the lens is 1.5, the power of the lens is:

[4 Marks]

(A) + 5D

(B) + 20D

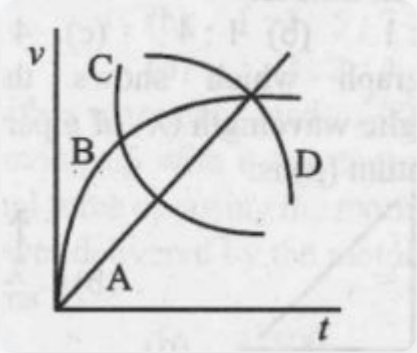
(C) + 2D

(D) infinity

Question 6.

A spherical ball is dropped in a long column of a highly viscous liquid. The curve in the graph shown, which represents the speed of the ball (v) as a function of time (t) is:

[4 Marks]



(A) C

(B) A

(C) B

(D) D

Question 7.

The ratio of the radius of gyration of a thin uniform disc about an axis passing through its centre and normal to its plane to the radius of gyration of the dis about its diameter is:

[4 Marks]

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

(B) 4 : 1

(C) 2 : 1

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

Question 8.

A shell of mass m is at rest initially. It explodes into three fragments having mass in the ratio 2:2: 1. If the fragments having equal mass fly off along mutually perpendicular directions with speed v, the speed of the third (lighter) fragment is

[4 Marks]

(A) $2\sqrt{2}$ v

(B) $3\sqrt{2}$ v

(C) v

(D) $\sqrt{2}$ v

Question 9.

A long solenoid of radius 1 mm has 100 turns per mm. If 1A current flows in the solenoid, the magnetic field strength at the centre of the solenoid is

[4 Marks]

(A) 12.56×10^{-2} T

(B) 6.28×10^{-4} T

(C) 6.28×10^{-2} T

(D) 12.56×10^{-4} T

Question 10.

Let T_1 and T_2 be the energy of an electron in the first and second excited states of hydrogen atom, respectively. According to the Bohr's model of an atom, the ratio T_1: T_2 is:

[4 Marks]

(A) 1 : 4

(B) 9 : 4

(C) 4 : 1

(D) 4 : 9

Question 11.

A light ray falls on a glass surface of refractive index √3 at an angle 60°. The angle between the refracted and reflected rays would be:

[4 Marks]

(A) 30°

(B) 60°

(C) 90°

(D) 120°

Question 12. If a soap bubble expands, the pressure inside the bubble:

[4 Marks]

(A) increases

(B) remains the same

(C) is equal to the atmospheric pressure

(D) decreases

Question 13.

Plane angle and solid angle have:

[4 Marks]

(A) Units but no dimensions

(B) Dimensions but no units

(C) No units and no dimensions

(D) Both units and dimensions

Question 14.

When light propagates through a material medium of relative permittivity ε_r and relative permeability μ_r, the velocity of light, v is given by: (c-velocity of light in vacuum)

[4 Marks]

(A) $v = c$

(B) $v = \sqrt{(\mu_r/\varepsilon_r)}$

(C) $v = c/\sqrt{(\varepsilon_r\ \mu_r)}$

(D) $v = \sqrt{(\varepsilon_r/\mu_r)}$

Question 15.

Two resistors of resistance, 100 Ω and 200 Ω are connected in parallel in an electrical circuit. The ratio of the thermal energy developed in 100 Ω to that in 200 Ω in a given time is:

[4 Marks]

(A) 2 : 1

(B) 1 : 2

(C) 4 : 1

(D) 1 : 4

Question 16.

The graph which shows the variation of the de Broglie wavelength (λ) of a particle and its associated momentum (p) is:

[4 Marks]

(A) a



(B) d



(C) b



(D) c



Question 17.

A square loop of side 1 m and resistance 1 Ω is placed in a magnetic field of 0.5 T. If the plane of loop is perpendicular to the direction of magnetic field, the magnetic flux through the loop is:

[4 Marks]

(A) Zero weber

(B) 0.5 weber

(C) 2 weber

(D) 1 weber

Question 18. The dimensions $[MLT^{-2} A^{-2}]$ belong to the:

[4 Marks]

(A) magnetic permeability

(B) self inductance

(C) electric permittivity

(D) magnetic flux

Question 19.

When two monochromatic lights of frequency, υ and υ/2 are incident on a photoelectric metal, their stopping potential becomes $V_s/2$ and V_s respectively. The threshold frequency for this metal is:

[4 Marks]

(A) 2 υ

(B) (2/3) υ

(C) (3/2) υ

(D) 3 υ

Question 20.

In half wave rectification, if the input frequency is 60 Hz, then the output frequency is would be:

[4 Marks]

(A) 30Hz

(B) 60Hz

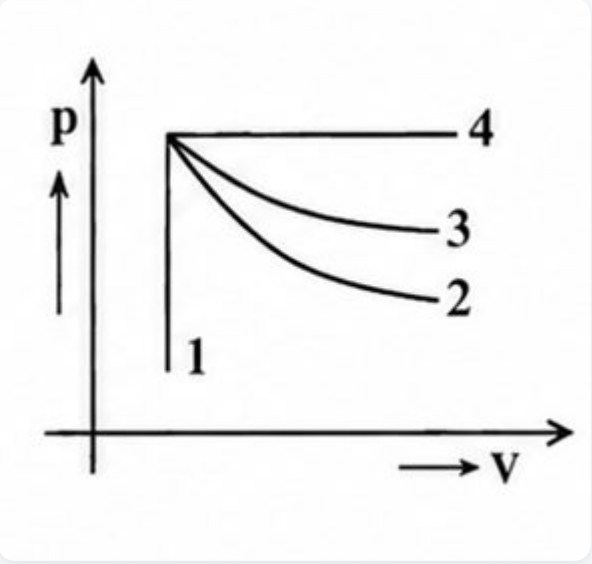
(C) 120Hz

(D) Zero

Question 21.

An ideal gas undergoes four different processes from the same initial state as shown in the figure below. Those processes are adiabatic, isothermal, isobaric and isochoric. The curve which represents the adiabatic process among 1, 2, 3 and 4 is:

[4 Marks]



(A) 1

(B) 3

(C) 4

(D) 2

Question 22.

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

[4 Marks]

List-I (Electromagnetic waves)		List-II (Wavelength)	
(A)	AM radio waves	(i)	10^{-10}
(B)	Microwaves	(ii)	10^{2} m
(C)	Infared radiations	(iii)	10^{-2} m
(D)	X-rays	(iv)	10^{-4} m

(A) A - iii: B - ii: C - i; D - iv

(B) A - iii; B - iv : C - iv: D - i

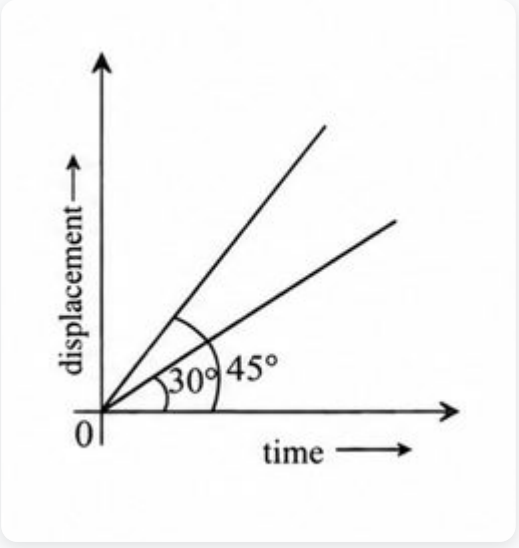
(C) A - ii; B - iii: C - iv; D - i

(D) A - iv; B - iii; C - ii; D- i

Question 23.

The displacement-time graphs of two moving particles make angles of 30° and 45° with the x-axis as shown in the figure. The ratio of their respective velocity is:

[4 Marks]



(A) 1 : 1

(B) 1 : √ 3

(C) 1 : 2

(D) √ 3 : 1

Question 24.

InaYoung's doubleslitexperiment, astudentobserves 8 fringes in a certain segment of screen when amonochromatic light of 600 nm wavelength is used. If the wavelength of light is changed to 400 nm, then the number of fringes he would observe in the same region of the screen is:

[4 Marks]

(A) 6

(B) 9

(C) 12

(D) 8

Question 25.

The peak voltage of the ac source is equal to:

[4 Marks]

(A) 1 /√2 times the rms values of the ac source

(B) the rms value of the ac source

(C) the value of voltage supplied to the circuit.

(D) √2 times the rms values of the ac source

Question 26.

If the initial tension on a stretched string is doubled, then the ratio of the initial and final speeds of a transverse wave along the string is:

[4 Marks]

(A) 1 : √2

(B) 1 : 2

(C) 1 : 1

(D) √2 : 1

Question 27.

Given below are two statements:

Statement I: Biot-Savart's law gives us the expression for the magnetic field strength of an infinitesimal current element(Idl) of a current carrying conductor only.

statement II: Biot-Savart's law is analogous to Coulomb's inverse square law of charge g, with the former being related to the field produced by a scalar source, Idl while the latter being produced by a vector source q.

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

[4 Marks]

(A) Both statement I and Statement II are correct

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

(C) Statement I is correct and Statement II is incorrect

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

Question 28.

As the temperature increase, the electrical resistance:

[4 Marks]

(A) decreases for both conductors and semiconductors

(B) increases for conductors but decreases for semiconductors

(C) decreases for .conductors but increase for semiconductors

(D) increases for both conductors and semiconductors.

Question 29.

The energy that will be ideally rediated by a 100 kW transmitter in 1 hour is:

[4 Marks]

(A) 36×10^7 J

(B) 1×10^5 J

(C) 36×10^5 J

(D) 36×10^4 J

Question 30.

A body of mass 60 g experiences a gravitational force of 3.0 N, when placed at a particular point. The magnitude of the gravitational field intensity at that point is:

[4 Marks]

(A) 0.05 N/kg

(B) 180 N/kg

(C) 50 N/kg

(D) 20 N/kg

Question 31.

In the given nuclear reaction, the element X is : $^{22}_{11}Na \rightarrow X + e^+ + \nu$

[4 Marks]

(A) $^{23}_{11}Na$

(B) $^{22}_{12}Mg$

(C) $^{22}_{10}Ne$

(D) $^{23}_{10}Ne$

Question 32.

The angle between the electric lines of force and the quintessential surface is:

[4 Marks]

(A) 0°

(B) 180°

(C) 90°

(D) 45°

Question 33.

A copper wire of length 10 m and radius $(10^{-2}/\sqrt{\pi})$ m has electrical resistance of 10 Ω. The current density in the wire for an electric field strength of 10 (V/m) is :

[4 Marks]

(A) 10^6 A/m²

(B) 10^4 A/m²

(C) 10^5 A/m²

(D) 10^{-5} A/m²

Question 34.

The ratio of the distances travelled by a freely falling body in the 1^{st}, 2^{nd}, 3^{rd} and 4^{th} second:

[4 Marks]

(A) 1 : 4 : 9 : 16

(B) 1 : 2 : 3 : 4

(C) 1 : 3 : 5 : 7

(D) 1 : 1 : 1 : 1

Question 35.

An electric lift with a maximum load of 2000 kg (lift + passengers) is moving up with a constant speed of 1.5 ms^{-1}. The frictional force opposing the motion is 3000 N. The minimum power delivered by the motor to the lift in watts is :($g = 10ms^{-2}$)

[4 Marks]

(A) 23000

(B) 23500

(C) 34500

(D) 20000

Question 36.

The volume occupied by the molecules contained in 4.5 kg water of STP, if the intermolecular forces vanish away is:

[4 Marks]

(A) 5.6×10^6 m³

(B) 5.6 m³

(C) 5.6×10^{-3} m³

(D) 5.6×10^3 m³

Question 37.

The area of a rectangular field (in m²) of length 55.3 m and breadth 25 m after rounding off the value of correct significant digits is:

[4 Marks]

(A) 14×10^2

(B) 138×10^1

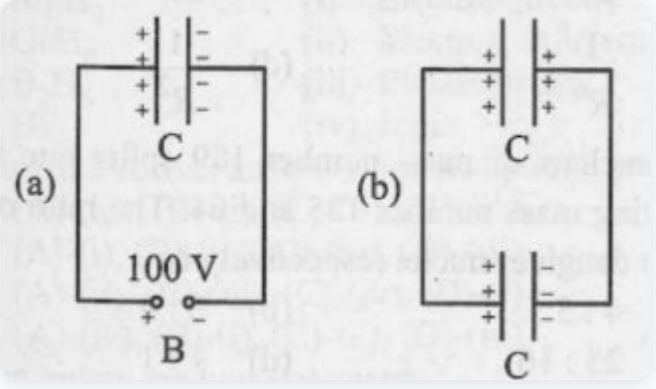
(C) 1382.5

(D) 1382

Question 38.

A capacitor of capacitance C = 900 pF is charged fully by 100 V battery B as shown in figure (a). Then it is disconnected from the battery and connected to another uncharged capacitor of capacitance C = 900 pF as shown in figure (b). The electrostatic energy stored by the system (b) is

[4 Marks]



(A) 3.25×10^{-6} J

(B) 2.25×10^{-6} J

(C) 4.5×10^{-6} J

(D) 1.5×10^{-6} J

Question 39.

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

[4 Marks]

	List-I		List-II
(A)	Gravitational constant (G)	(i)	$[L^2T^2]$
(B)	Gravitational potential energy	(ii)	$[M^{-1}L^3T^{-2}]$
(C)	Gravitational potential	(iii)	$[LT^{-2}]$
(D)	Gravitational intensity	(iv)	$[ML^2T^{-2}]$

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

(B) A - ii; B - i; C - iv; D - iii

(C) A - iv; B - ii; C - i; D - iii

(D) A - ii; B - iv; C - i; D - iii

Question 40.

Two pendulums of length 121 cm and 100 cm start vibrating in phase. At some instant, the two are at their mean position in the same phase. The minimum number of vibrations of the shorter pendulum after which the two are again in phase at the mean position is:

[4 Marks]

(A) 9

(B) 10

(C) 11

(D) 8

Question 41.

Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A): The stretching of a spring is determined by the shear modulus of the material of the

spring. Reason (R): A coil spring of copper has more tensile strength than a steel spring of same dimensions.

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

[4 Marks]

(A) Both (A) and (R).are triie and (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 42.

A ball is projected with a velocity, 10 ms^{-1}, at an angle of 60° with the vertical direction. Its speed at the highest point of its trajectory will be:

[4 Marks]

(A) 10 ms^{-1}

(B) Zero

(C) 5 ms^{-1}

(D) $5\sqrt{3}$ ms^{-1}

Question 43. Two transparent media A and B are separated by a plane boundary. The speed of light in those media are 1.5×10^8 m/s and 2.0×10^8 m/s, respectively. The critical angle for a ray of light for these two media is:

[4 Marks]

(A) $\tan^{-1}(0.500)$

(B) $\tan^{-1}(0.750)$

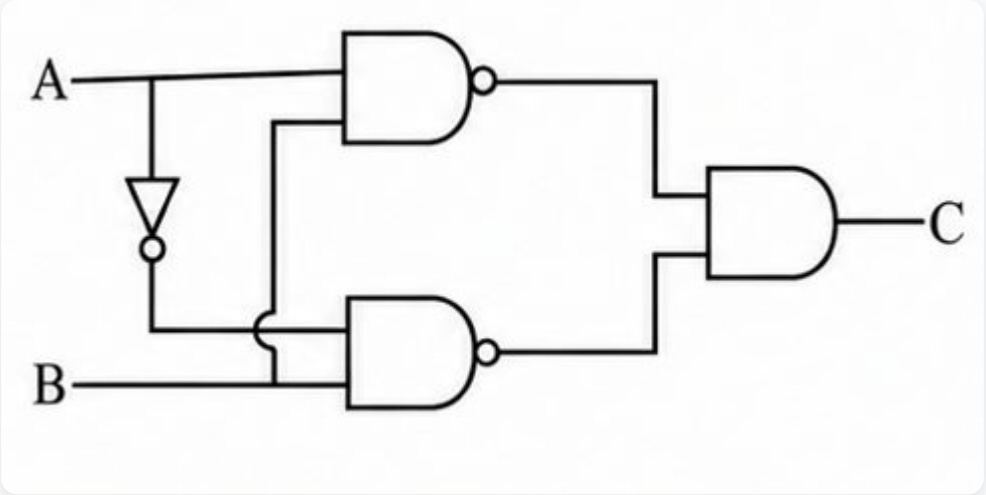
(C) $\sin^{-1}(0.500)$

(D) $\sin^{-1}(0.750)$

Question 44.

The truth table for the given logic circuit is:

[4 Marks]



(A) a

A	B	C
0	0	1
0	1	0
1	0	0
1	1	1

(B) b

A	B	C
0	0	1
0	1	0
1	0	1
1	1	0

(C) d

A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

(D) c

A	B	C
0	0	0
0	1	1
1	0	0
1	1	1

Question 45.

A series LCR circuit with inductance 10 H, capacitance 10 μF, resistance 50 Ω is connected to an ac source of voltage, V = 200 sin (100 t) volt. If the resonant frequency of the LCR circuit is ν_0 and the frequency of the ac source is ν, then

[4 Marks]

(A) ν = 100 Hz, $\nu_0 = (100/\pi)$ Hz

(B) $\nu_0 = (50/\pi)$ Hz, ν = 50 Hz

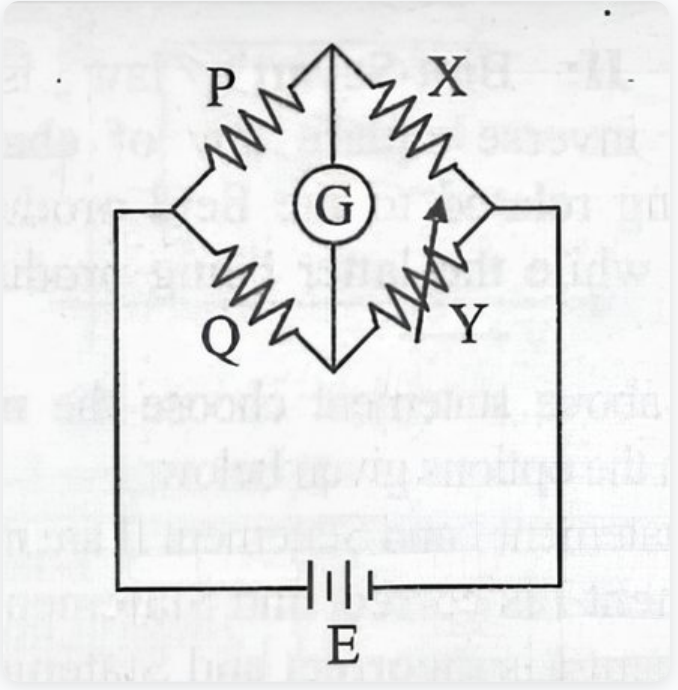
(C) $\nu_0 = \nu = 50$ Hz

(D) $\nu_0 = \nu = (50/\pi)$ Hz

Question 46.

A wheatstone bridge is used to determine the value of unknown resistance X by adjusting the variable resistance Y as shown in the figure. For the most precise measurement of X, the resistances P and Q:

[4 Marks]



(A) do not play any significant role

(B) should be approximately equal to 2X

(C) should be very large and unequal

(D) should be approximately equal and are small

Question 47.

From Ampere's circuital law for a long straight wire of circular cross-section carrying a steady current, the variation of magnetic field in the inside and outside region of the wire is:

[4 Marks]

(A) a linearly increasing function of distance upto the boundary of the wire and then linearly decreasing for the outside region.

(B) uniform and remains constant for both the regions.

(C) a linearly decreasing function of distance upto the boundary of the wire and then a linearly increasing one for the outside region.

(D) a linearly increasing function of distance r upto the 'boundary of the wire and then decreasing one with 1/r dependence for the outside region.

Question 48. A big circular coil of 1000 turns and average radius 10 m is rotating about its horizontal diameter at 2 rad s^{-1}. If the vertical component of earth's magnetic field at that place is 2 x 10^{-5} T and electrical resistance of the coil is 12.56 Ω , then the maximum induced current in the coil will be:

[4 Marks]

(A) 1.5 A

(B) 2 A

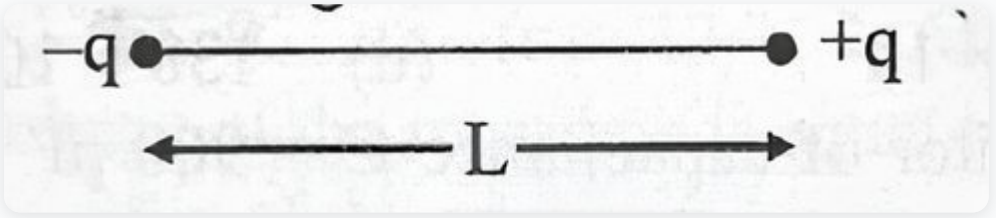
(C) 0.25 A

(D) 1 A

Question 49.

Two point charges —q and +q are placed at a distance of L, as shown in the figure. The magnitude of electric field intensity at a distance R(R>>L) varies as:

[4 Marks]



(A) $1/R^3$

(B) $1/R^4$

(C) $1/R^6$

(D) $1/R^2$

Question 50.

Given below are two statements:

Statement I: In the coagulation of a negative sol, the flocculating power of the three given ions is in the order: $Al^{3+} > Ba^{2+} > Na^+$

Statement II: In the coagulation of a positive sol, the flocculating power of the three given salts is in the order: $NaCl > Na_2SO_4 > Na_3PO_4$

In the light of 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) Both statement I and statement II are correct.

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

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

Question 51. Which statement regarding polymers is not correct?

[4 Marks]

(A) Fibers possess high tensile strength.

(B) Thermoplastic polymers are capable of repeatedly softening and hardening on heating and cooling respectively.

(C) Thermosetting polymers are reusable.

(D) Elastomers have polymer chains held together by weak intermolecular forces.

Question 52.

The incorrect statement regarding chirality is:

[4 Marks]

(A) S_N1 reaction yields 1 : 1 mixture of both enantiomers.

(B) A racemic mixture shows zero optical rotation.

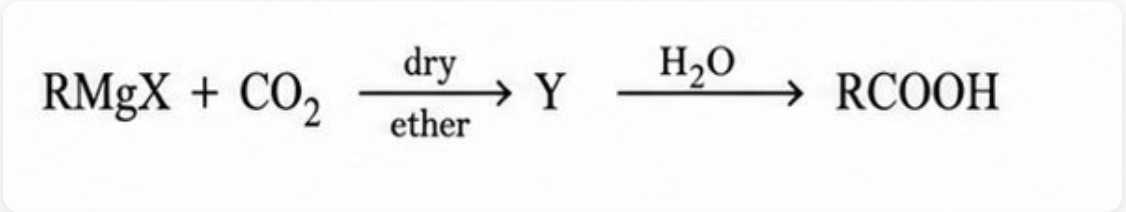
(C) Enantiomers are superimposable mirror images of each other.

(D) The product obtained by S_N2 reaction of haloalkane having chirality at the reactive site shows inversion of configuration.

Question 53.

What is Y in the above reaction:

[4 Marks]



(A) $(RCOO)_2Mg$

(B) $RCOO^-Mg^+X$

(C) $RCOO^-X^+$

(D) $R_3CO^-Mg^+X$

Question 54. In one molal solution that contains 0.5 mole of a solute, there is

[4 Marks]

(A) 500 g of solvent

(B) 100 mL of solvent

(C) 500 mL of solvent

(D) 1000 g of solvent

Question 55.

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

[4 Marks]

List-I (Hydrides)	List-II (Nature)
(A) MgH_2	(i) Electron precise
(B) GeH_4	(ii) Electron deficient
(C) B_2H_6	(iii) Electron rich
(D) HF	(iv) Ionic

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

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

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

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

Question 56.

Given below are two statements : -

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

Statements II : The boiling points aldehydes and ketones are lower than the alcohols of similar molecular masses due to the absence of H-bonding. In the light of the statements, choose the most appropriate answer from the options given below:

[4 Marks]

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

(B) Both statements I and statement II are incorrect.

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

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

Question 57.

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

[4 Marks]

List-I (Products formed)	List-II (Reaction of carbonyl compound with)
(A) Cyanohydrin	(i) NH_2OH
(B) Acetal	(ii) RNH_2
(C) Schiff's base	(iii) alcohol
(D) Oxime	(iv) HCN

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

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

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

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

Question 58.

Which one is not correct mathematical equation for Dalton's Law of partial pressure? Here p = total pressure of gaseous mixture

[4 Marks]

(A) $p_i = x_i p$, where p_i = (partial pressure of i^{th} gas) x_i = mole fraction of i^{th} gas in gaseous mixture

(B) $p = p_1 + p_2 + p_3$

(C) $p_i = x_i p_i°$, where (x_i = mole fraction of i^{th} gas in gaseous mixture) ($p_i°$ = pressure of i^{th} gas in pure state)

(D) $P = n_1(RT / V) + n_2(RT / V) + n_3(RT / V)$

Question 59.

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

[4 Marks]

List-I (Drug class)	List-II (Drug molecule)
(A) Antacids	(i) Salvarsan
(B) Antihistamines	(ii) Morphine
(C) Analgesics	(iii) Cimetidine
(D) Antimicrobials	(iv) Seldane

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

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

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

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

Question 60.

Given below are two statements:

Statement I: The boiling points of the following hydrides of group 16 elements increases in the order —$H_2O < H_2S < H_2Se < H_2Te$

Statement II: The boiling points of these hydrides increase with increase in molar mass.

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

[4 Marks]

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

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

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

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

Question 61.

The IUPAC name of the complex $[Ag(H_2O)][Ag(CN)_2]$ is :

[4 Marks]

(A) dicyanidosilver(I) diaquaargentate(I)

(B) diaquasilver (II) dicyanidoargentate (II)

(C) dicyanidosilver (Il) diaquaargentate (II)

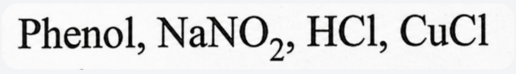
(D) diaquasilver (I) dicyanidoargentate (I)

Question 62.

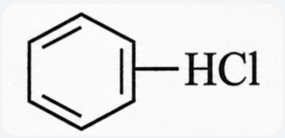
Which of the following is suitable to synthesize chlorobenzene ?

[4 Marks]

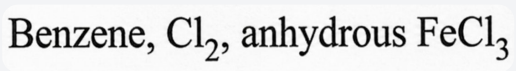
(A) a



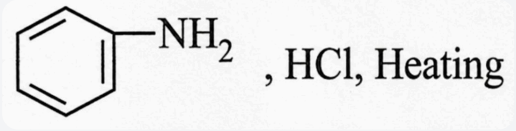
(B) b



(C) d



(D) c



Question 63.

Given below are two statements; one is labelled as Assertion (A) and the other is labelled as Reason (R). Assertion (A) : ICl is more reactive than I_2.

Reason (R) : I-Cl bond is weaker than I-I bond.

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

[4 Marks]

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

(B) (A) is correct but (R) is not correct.

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

(D) (A) isnot correct but (R) is correct.

Question 64.

The IUPAC name of an element with atomic number 119 is

[4 Marks]

(A) ununennium

(B) ununoctium

(C) unnilennium

(D) unununnium

Question 65. At 298 K, the standard electrode potentials of Cu^{2+}/Cu, Zn^{2+}/Zn, Fe^{2+}/Fe and Ag^{+}/Ag are 0.34 V, –0.76 V, –0.44 V and 0.80 V, respectively. On the basis of standard electrode potential, predict which of the following reaction can not occur?

[4 Marks]

(A) $CuSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Cu(s)$

(B) $FeSO_4(aq) + Zn(s) \rightarrow ZnSO_4(aq) + Fe(s)$

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

(D) $2CuSO_4(aq) + 2Ag(s) \rightarrow 2Cu(s) + Ag_2SO_4(aq)$

Question 66.

Which compound amongst the following is not an aromatic compound?

[4 Marks]

(A) A



(B) C



(C) B



(D) D



Question 67.

Choose the correct statement:

[4 Marks]

(A) Diamond is sp^3 hybridised and graphite is sp^2 hybridized.

(B) Diamond and graphite have two dimensional network.

(C) Both diamond and graphite are used as dry lubricants.

(D) Diamond is covalent and graphite is ionic.

Question 68.

Given below are two statements:

Statement I: Primary aliphatic amines react with HNO_2 to give unstable diazonium salts. Statement II: Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K.

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) Both statement I and statement II are correct.

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

(D) Statement I is incorrect but statement II is correct,

Question 69.

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

Assertion (A): In a particular point defect, an ionic solid is electrically neutral, even if few of its cations are missing from its unit cells.

Reason (R): In an ionic solid, Frenkel defect arises due to dislocation of cation from its lattice site to interstitial site, maintaining overall electrical neutrality.

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

[4 Marks]

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

(B) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

(C) (A) is not correct but (R) is correct.

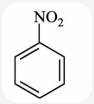
(D) (A) is correct but (R) is not correct.

Question 70.

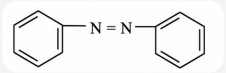
The Kjeldahl's method for the estimation of nitrogen can be used to estimate the amount of nitrogen in which one of the following compounds?

[4 Marks]

(A) D



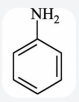
(B) C



(C) A



(D) B



Question 71.

Which of the following p-V curve represents maximum work done?

[4 Marks]

(A) d



(B) c



(C) a



(D) b



Question 72.

Which of the following statement is not correct about diborane ?

[4 Marks]

(A) There are two 3-centre-2-electron bonds.

(B) Both the Boron atoms are sp^2 hybridised.

(C) The four terminal Hydrogen atoms and the two Boron atoms lie in one plane.

(D) The four terminal B-H bonds are two centre two electron bonds.

Question 73.

The pH of the solution containing 50 mL each of 0.10 M sodium acetate and 0.01 M acetic acid is [Given pK_a of CH_3COOH = 4.57]

[4 Marks]

(A) 4.57

(B) 3.57

(C) 2.57

(D) 5.57

Question 74. Which amongst following is incorrect statement?

[4 Marks]

(A) H_2^+ ion has one electron.

(B) C_2 molecule has four electrons in its two degenerate π molecular orbitals.

(C) O_2^+ ion has diamagnetic.

(D) The bond orders of O_2^+, O_2, O_2^- and O_2^{2-} are 2.5, 2, 1.5 and 1, respectively.

Question 75.

Amongst the following which one will have maximum 'lone pair-lone pair" electron repulsions?

[4 Marks]

(A) IF_5

(B) XeF_2

(C) ClF_3

(D) SF_4

Question 76.

What mass of 95% pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction? $CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + CO_2(g) + H_2O(l)$ [Calculate upto second place of decimal point]

[1 Marks]

(A) 9.50 g

(B) 1.32 g

(C) 3.65 g

(D) 1.25 g

Question 77. Identify the incorrect statement from the following :

[4 Marks]

(A) The oxidation number of K in KO_2 is + 4.

(B) Ionisation enthalpy of alkali metals decreases from top to bottom in the group.

(C) Alkali metals react with water to form their hydroxides.

(D) Lithium is the strongest reducing agent among the alkali metals.

Question 78.

Gadolinium has a low value of third ionisation enthalpy because of

[4 Marks]

(A) small size

(B) high basic character

(C) high exchange enthalpy

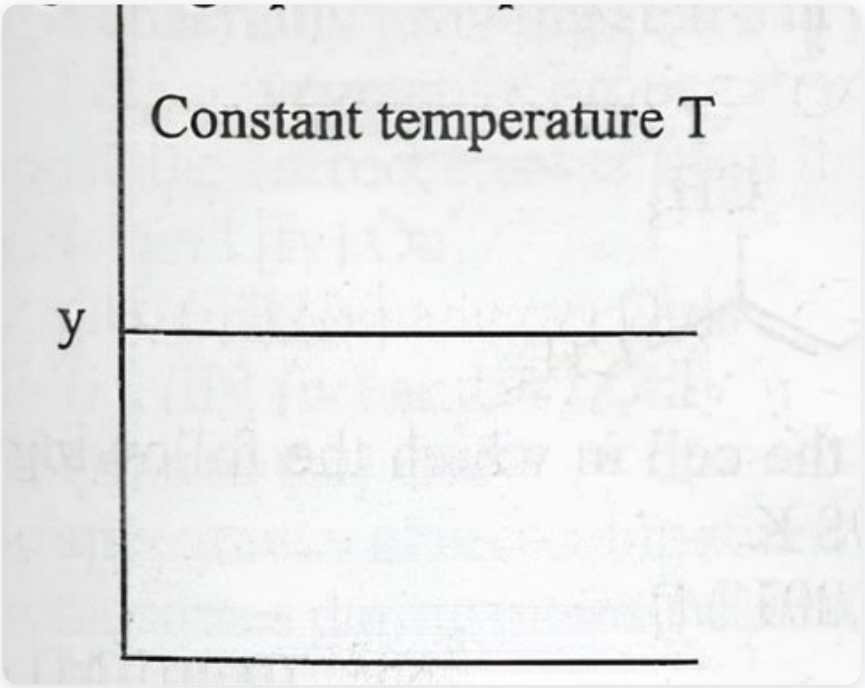
(D) high electronegativity

Question 79.

The given graph is a representation of kinetics of a reaction.

The y and x axes for zero and first order reactions, respectively are

[4 Marks]



(A) zero order (y = concentration and x = time), first order (y =t_1/2 and x = concentration)

(B) zero order (y = rate and x = concentration), first order (y = t_1/2, and x = concentration)

(C) zero order (y = concentration and x = time), first order (y = rate constant and x = concentration)

(D) zero order (y = rate and x = concentration), first order (y =rate and x =t_1/2)

Question 80. The incorrect statement regarding enzymes is:

[4 Marks]

(A) Like chemical catalysts enzymes reduce the activation energy of bio processes

(B) Enzymes are polysaccharides.

(C) Enzymes are biocatalysts.

(D) Enzymes are very specific for a particular reaction and substrate.

Question 81. Identify the incorrect statement from the following.

[4 Marks]

(A) In an atom,all the five 3d orbitals are equal in energy in free state.

(B) All the five 4d orbitals have shapes similar to the respective 3d orbitals.

(C) The shapes of d_xy, d_yz, and d_zx orbitals are similar to each other; and and $d_{x^2 - y^2}$ and d_{z^2} are similar to each other.

(D) All the five 5d orbitals are different in size when compared to the respective 4d orbitals.

Question 82.

Given below are half cell reactions:

$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{2+} + 4H_2O$, $E°_{Mn^{2+} / mno_4^-} = -1.510V$ $(1/2)O_2 + 2H^+ + 2e^- \rightarrow H_2O$

$E°_{o_2 / H_2O} = +1.223V$

Will the permanganate ion, MnO_4^- liberate O_2 from water in the presence of an acid ?

[4 Marks]

(A) Yes, because E°_cell = +2.733V

(B) No, because E°_cell = -0.287 V

(C) Yes, because E°_cell = +0.287V

(D) No, because E°_cell = -2.733V

Question 83.

Match List-I with List-II.

[4 Marks]

	List-I		List-II
(A)	Li	(i)	absorbent for carbon dioxide
(B)	Na	(ii)	electrochemical cells
(C)	KOH	(iii)	coolant in fast breeder reactors
(D)	Cs	(iv)	photoelectric cell

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

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

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

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

Question 84.

Given below are two statements:

Statement I: The acidic strength of monosubstituted nitrophenol is higher than phenol because of electron withdrawing nitro group.

Statement II: o-nitrophenol, m-nitrophenol and p-nitophenol will have same acidic strength as they have one nitro group attached to the phenolic ring.

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) Both Statement I and Statement II are incorrect.

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

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

Question 85.

The pollution due to oxides of sulphur gets enhanced due to the presence of:

(A) particulate matter

(B) ozone

(C) hydrocarbons

(D) hydrogen peroxide Choose the most appropriate answer from the options given below:

[4 Marks]

(A) (a), (d) only

(B) (a), (c), (d) only

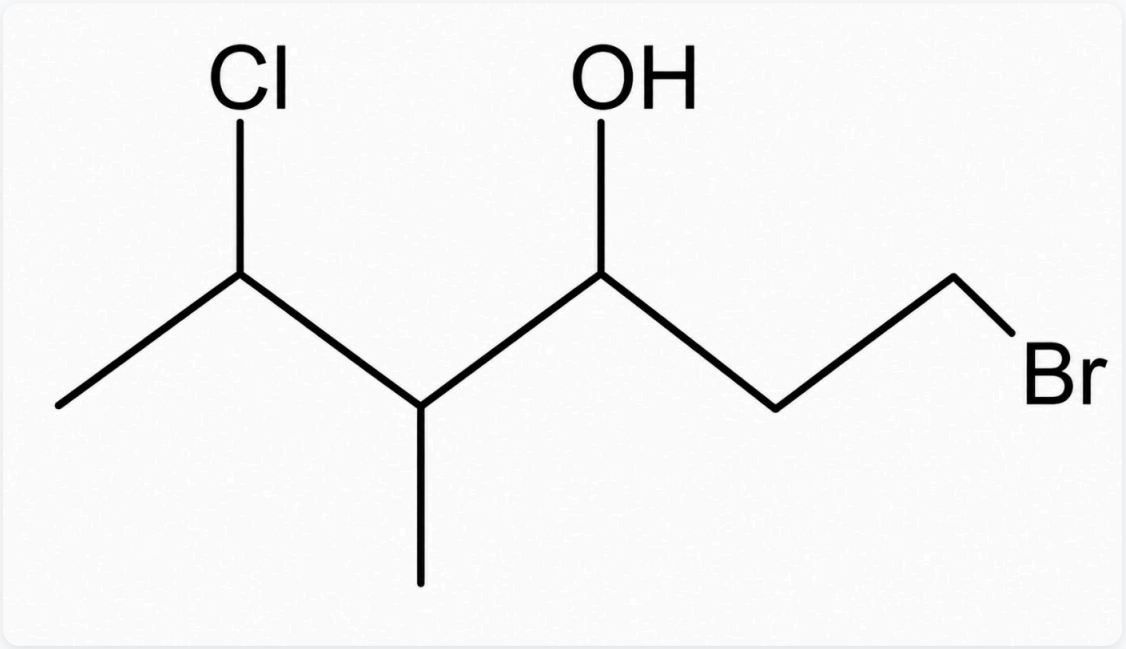
(C) (a),(b),(d) only

(D) (b), (c), (d) only

Question 86.

The correct IUPAC name of the following compound is:

[4 Marks]



(A) 1-bromo-4-methyl-5-chlorohexan-3-ol

(B) 6 bromo-2-chloro-4 methylhexan-4-ol

(C) 6-bromo-4-methyl-2-chlorohexan-4-ol

(D) 1-bromo-5-chloro-4-methylhexan-3-ol

Question 87.

$3O_2(g) \rightleftharpoons 2O_3(g)$ for the above reaction at 298 K, K_C is found to be 3.0×10^{-59}. If the concentration of O_2 at equilibrium is 0.040 M then concentration of O_3 in M is

[4 Marks]

(A) 1.2×10^{21}

(B) 4.38×10^{-32}

(C) 1.9×10^{-63}

(D) 2.4×10^{31}

Question 88.

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 (Ores)		List-II (Composition)
(A)	Haematite	(i)	Fe_3O_4
(B)	Magnetite	(ii)	$ZnCO_3$
(C)	Calamine	(iii)	Fe_2O_3
(D)	Kaolinite	(iv)	$[Al_2(OH)_4Si_2O_5]$

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

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

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

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

Question 89.

Given below are two statements:

Statement I: In Lucas test, primary, secondary and tertiary alcohols are distinguished on the basis of their reactivity with cone. HCI + $ZnCl_2$, known as Lucas Reagent.

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

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

[4 Marks]

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

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

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

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

Question 90.

In the neutral or faintly alkaline medium, $KMnO_4$ oxidises iodide into iodate. The change in oxidation state of manganese in this reaction is from

[4 Marks]

(A) + 7 to + 4

(B) + 7 to + 3

(C) + 6 to + 4

(D) + 6 to + 5

Question 91.

For a first order reaction A → Products, initial concentration of A is 0.1 M, which becomes 0.001 M after 5 minutes. Rate constant for the reaction in min^{-1} is

[4 Marks]

(A) 0.4606

(B) 0.9212

(C) 0.2303

(D) 1.3818

Question 92.

Compound X on reaction with O_3 followed by Zn/H_2O gives formaldehyde and 2-methyl propanal as products. The compound X is:

[4 Marks]

(A) 3-Methylbut-1-ene

(B) Pent-2-ene

(C) 3-Methylbut-2-ene

(D) 2-Methylbut-1-ene

Question 93.

A 10.0 L flask contains 64 g of oxygen at 27°C. (Assume O_3 gas is behaving ideally). The pressure inside the flask in bar is (Given R =0.0831 L bar K^{-1} mol^{-1})

[4 Marks]

(A) 2.5

(B) 4.9

(C) 49.8

(D) 498.6

Question 94.

The order of energy absorbed which is responsible for the colour of complexes

(A) $[Ni(H_2O)_2(en)_2]^{2+}$

(B) $[Ni(H_2O)_4(en)]^{2+}$

(C) $[Ni(en)_3]^{2+}$

[4 Marks]

(A) (C)>(B)>(A)

(B) (A)>(B)>)C)

(C) (B)>(A)>(C)

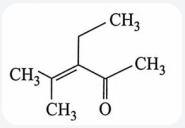
(D) (C)>(A)>(B)

Question 95.

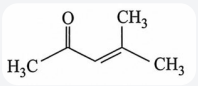
Which one of the following is not formed when acetone reacts with 2-pentanone in the presence of dilute NaOH followed by heating?

[4 Marks]

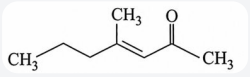
(A) c



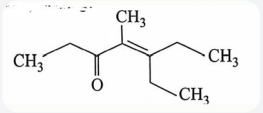
(B) d



(C) b



(D) a



Question 96.

Find the emf of the cell in which the following reaction takes place at 298 K. $Ni(s) + 2Ag^{+}(0.001M) \rightarrow Ni^{2+}(0.001\ M) + 2Ag(s)$

(Given that $E°_cell = 10.5V$, $2.303RT / F = 0.059$ at 298 K)

[4 Marks]

(A) 1.385 V

(B) 0.9615 V

(C) 1.05 V

(D) 1.0385 V

Question 97.

If radius of second Bohr orbit of the He^{+} ion is 105.8 pm, what is the radius of third Bohr orbit of Li^{2+} ion?

[4 Marks]

(A) 158.7 pm

(B) 158. 7 Å

(C) 15.87 pm

(D) 1.587 pm

Question 98.

Copper crystallises in fec unit cell with cell edge length of 3.608×10^{-8} cm. The density of copperis 8.92 g cm^{-3} Calculate the atomic mass of copper.

[4 Marks]

(A) 63.1 u

(B) 60 u

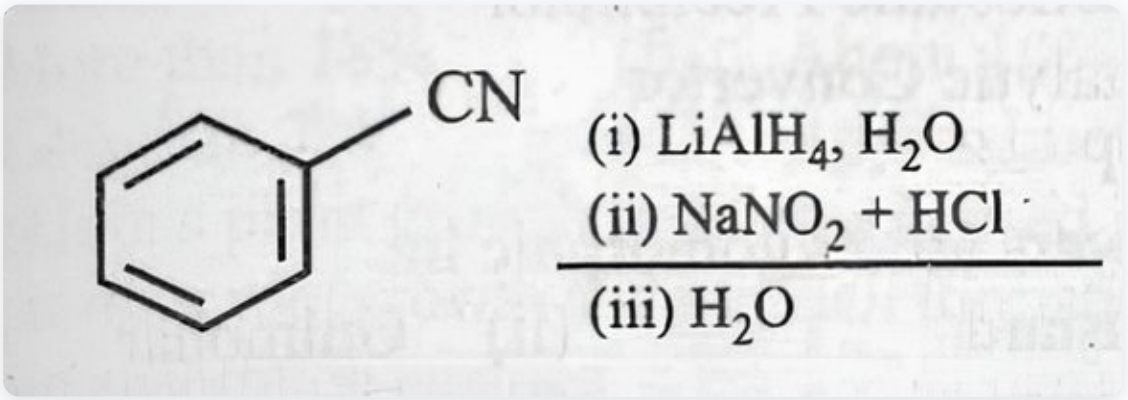
(C) 31.55 u

(D) 65 u

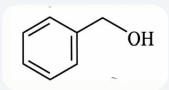
Question 99.

The product formed from the following reaction sequence is

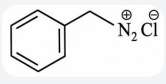
[4 Marks]



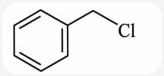
(A) c



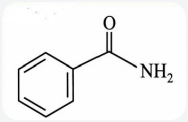
(B) a



(C) b



(D) d



Question 100.

Read the following statements about the vascular bundles:

(i) In roots, xylem and phloem in a vascular bundle are arranged in an altenate manner along the different radii.

(ii) Conjoint closed vascular bundles do not possess cambium

(iii) In open vascular bundles, cambium is present in between xylem and phloem

(iv) The vascular bundles of dicotyledonous stem possess endarch protoxylem

(v) In monocotyledonous root, usually there are more than six xylem bundles present Choose the correct answer from the options given below :

[4 Marks]

(A) (i), (ii) and (iv) only

(B) (i), (ii), (iii) and (iv) only

(C) (i), (ii), (iv) and (v) only

(D) (ii), (iii), (iv) and (v) only

Question 101.

Identify the correct set of statements:

(i) The leaflets are modified into pointed hard thorns in Citrus and Bougainvillea

(ii) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin

(iii) Stem is flattened and fleshy in Opuntia and modified to perform the function of leaves

(iv) Rhizophora shows vertically upward growing roots that help to get oxygen for respiration

(v) . Subaerially growing stems in grasses and strawberry help in vegetative propagation Choose the correct answer from the options given below:

[4 Marks]

(A) (i) and (iv) Only

(B) (ii), (iii),(iv) and (v) Only

(C) (ii) and (iii) Only

(D) (i), (ii), (iv) and (v) Only

Question 102. The appearance of recombination nodules on homologous chromosomes during meiosis characterizes:

[4 Marks]

(A) Bivalent

(B) Sites at which crossing over occurs

(C) Terminalization

(D) Synaptonemal complex

Question 103.

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

(i) Euchromatin is loosely packed chromatin

(ii) Heterochromatin is transcriptionally active

(iii) Histone octomer is wrapped by negatively charged DNA in nucleosome

(iv) Histones are rich in lysine and arginine

(v) Atypical nucleosome contains 400 by of DNA helix

Choose the correct answer from the options given below:

[4 Marks]

(A) (i), (iii), (iv) only

(B) (ii),(v) Only

(C) (i), (iii), (v) only

(D) (ii), (iv) , (v) only

Question 104.

Given below are two statements :

Statement I: The primary CO_2 acceptor in C_4 plants is phosphoenolpyruvate and is found in the mesophyll cells.

Statement II: Mesophyll cells of C_4 plants lack RuBisCo enzyme.

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

[4 Marks]

(A) Statement Iis incorrect but Statement II is correct

(B) Both Statement I and Statement II are correct

(C) Both Statement I and Statement II are incorrect

(D) Both Statement I and Statement II are incorrect

Question 105.

Identify the incorrect statement related to Pollination:

[4 Marks]

(A) Pollination by water is quite rare in flowering plants

(B) Moths and butterflies are the most dominant pollinating agents among insects

(C) Pollination by wind is more common amongst abiotic pollination

(D) Flowers produce foul odours to attract flies and beetles to get pollinated

Question 106.

Which one of the following statement is not true regarding get electrophoresis technique?

[4 Marks]

(A) Bright orange coloured bands of DNA can be observed in the gel when exposed to UV light.

(B) The process of extraction of separated DNA strands from gel is called elution.

(C) The presence of chromogenic substrate gives blue coloured DNA bands on the gel.

(D) The separated DNA fragments are stained by using ethidium bromide

Question 107.

Habitat loss and fragmentation, over exploitation, alien species invasion and co-extinction are causes for:

[4 Marks]

(A) Population explosion

(B) Natality

(C) Competition

(D) Biodiversity loss

Question 108.

Production of Cucumber has increased manifold in recent years. Application of which of the following phytohormones has resulted in this increased yield as the hormone is known to produce female flowers in the plants:

[4 Marks]

(A) Ethylene

(B) Gibberellin

(C) Cytokinin

(D) ABA

Question 109.

What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid ?

[4 Marks]

(A) Eight

(B) Six

(C) Two

(D) Four

Question 110.

Given below are two statements:

Statement I: Cleistogamous flowers are invariably autogamous

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

In the light of the above statements, choose the correct 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) Both Statement I and Statement II are correct

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

Question 111.

Hydrocolloid carrageen is obtained from

[4 Marks]

(A) Rhodophyceae only

(B) Phaeophyceae and Rhodophyceae

(C) Phaeophyceae only

(D) Chlorophyceae and Phaeophyceae

Question 112.

"Girdling Experiment" was performed by Plant Physiologists to identify the plant tissue through which:

[4 Marks]

(A) food is transported

(B) osmosis is observed

(C) water is transported

(D) for both water and food transportation

Question 113.

Which of the following is incorrectly matched?

[4 Marks]

(A) Ectocarpus - Fucoxanthin

(B) Volvox - Starch

(C) Ulothrix - Mannitol

(D) Porphyra - Floridian Starch

Question 114.

DNA polymorphism forms the basis of:

[4 Marks]

(A) Both genetic mapping and DNA finger printing

(B) Genetic mapping

(C) Translation

(D) DNA finger printing

Question 115.

Match List-I with List-II.

[4 Marks]

List-I		List-II	
(A)	Manganese	(i)	Activates the enzyme catalase
(B)	Magnesium	(ii)	Required for pollen germination
(C)	Boron	(iii)	Activates enzymes of respiration
(D)	Iron	(iv)	Functions in splitting of water during photosynthesis

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

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

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

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

Question 116.

The process of translation of mRNA to proteins begins as soon as :

[4 Marks]

(A) Both the subunits join together to bind with mRNA

(B) The larger subunit of ribosome encounters mRNA

(C) The tRNA is activated and the larger subunit of ribosome encounters mRNA

(D) The small subunit of ribosome encounters mRNA

Question 117.

The device which can remove particulate matter present in the exhaust from a thermal power plant is:

[4 Marks]

(A) Incinerator

(B) Electrostatic Precipitator

(C) Catalytic Convertor

(D) STP

Question 118.

The flowers are Zygomorphic in:
(i) Mustard (ii) Gulmohar
(iii) Cassia (iv) Datura
(v) Chilly
Choose correct answer from the options given below

[4 Marks]

(A) (iii), (iv), (v) Only

(B) (i), (ii), (iii) Only

(C) (iv), (v) Only

(D) (ii), (iii) Only

Question 119.

Given below are two statements; one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): Polymerase chain reaction is used in DNA amplification.
Reason (R): The ampicillin resistant gene is used as a selectable marker to check transformation.
In the light of the above statements, choose the correct answer from the options given below:

[4 Marks]

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

(B) (A) is not correct but (R) is correct

(C) (A) is correct but (R) is not correct

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

Question 120.

Which one of the following statements cannot be connected to Predation?

[4 Marks]

(A) It is necessitated by nature to maintain the ecological balance

(B) It might lead to extinction of a species

(C) It helps in maintaining species diversity in a community

(D) Both the interacting species are negatively impacted

Question 121.

Which one of the following never occurs during mitotic cell division?

[4 Marks]

(A) Spindle fibres attach to kinetochores of chromosomes

(B) Pairing of homologous chromosomes

(C) Coiling and condensation of the chromatids

(D) Movement of centrioles towards opposite poles

Question 122.

Which of the following is not a method of ex situ conservation?

[4 Marks]

(A) In vitro fertilization

(B) Cryopreservation

(C) Micropropagation

(D) National Parks

Question 123.

Given below are two statements:

Statement I: Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance

Statement II: Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height

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 incorrect

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

(C) Both Statement I and Statement II are incorrect

(D) Both Statement I and Statement II are correct

Question 124.

Which one of the following plants does not show plasticity?

[4 Marks]

(A) Maize

(B) Buttercup

(C) Cotton

(D) Coriander

Question 125.

What amount of energy is released from glucose during lactic acid fermentation?

[4 Marks]

(A) More than 18%

(B) Approximately 15%

(C) About 10%

(D) Less than 7%

Question 126.

The gaseous plant growth regulator is used in plants to :

[4 Marks]

(A) promote root growth and root hair formation to increase the absorption surface

(B) kill dicotyledonous weeds in the fields

(C) speed up the malting process

(D) help overcome apical dominance

Question 127.

Which of the following is not observed during apoplastic pathway?

[4 Marks]

(A) The movement does not involve crossing of cell membrane

(B) The movement is aided by cytoplasmic streaming

(C) Apoplastic is continuous and does not provide any barrier to water movement

(D) Movement of water occurs through intercellular spaces and wall of the cells.

Question 128.

Which one of the following is not true regarding the release of energy during ATP synthesis through chemiosmosis? It involves :

[4 Marks]

(A) Reduction of NADP to NADFI, on the stroma side of the membrane

(B) Breakdown of proton gradient

(C) Breakdown of electron gradient

(D) Movement of protons across the membrane to the stroma

Question 129.

Which one of the following plants shows vexillary aestivation and diadelphous stamens?

[4 Marks]

(A) Solanum nigrum

(B) Pisum sativum

(C) Allium cepa

(D) Colchicum autumnale

Question 130.

Given below are two statements:

Statement I: Decomposition is a process in which the detritus is degraded into simpler substances by microbes.

Statement II: Decomposition is faster if the detritus is rich in lignin and chitin

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 incorrect

(B) Both Statement I and Statement II are correct

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

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

Question 131.

Which one of the following produces nitrogen fixing nodules on the root of Alnus?

[4 Marks]

(A) Frankia

(B) Beijerinckia

(C) Rhodospirillum

(D) Rhizobium

Question 132.

Exoskeleton of arthropods is composed of:

[4 Marks]

(A) Cellulose

(B) Cutin

(C) Chitin

(D) Glucosamine

Question 133.

XO type of sex determination can be found in:

[4 Marks]

(A) Birds

(B) Drosophila

(C) Grasshoppers

(D) Monkeys

Question 134.

In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to:
(i) secretion of secondary metabolites and their deposition in the lumen of vessels.
(ii) deposition of organic compounds like tannins and resins in the central layers of stem.
(iii) deposition of suberin and aromatic substances in the outer layer of stem.
(iv) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.
(v) presence of parenchyma cells, functionally active xylem elements and essential oils
Choose the correct answer from the options given below:

[4 Marks]

(A) (i) and (ii) Only

(B) (ii) and (iv) only

(C) (iv) and (v) only

(D) (iii) and (iv) only

Question 135.

Match List-I with List-II

[4 Marks]

List-I		List-II	
(A)	Metacentric	(i)	Centromere situated close chromosome to the end forming one extremely short and one very long arms
(B)	Acrocentric	(ii)	Centromere at the terminal chromosome end
(C)	Sub-metacentric	(iii)	Centromere in the middle forming two equal arms of chromosomes
(D)	Telocentric	(iv)	Centromere slightly away chromosome from the middle forming one shorter arm and one longer arm

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

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

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

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

Question 136.

The entire fleet of buses in Delhi were converted to CNG from diesel. In reference to this, which one of the following statements is false?

[4 Marks]

(A) It is cheaper than diesel

(B) The same diesel engine is used in CNG buses making the cost of conversion low

(C) It can not be adulterated like diesel

(D) CNG burns more efficiently than diesel

Question 137.

Read the following statements on lipids and find out correct set of statements:
(i) Lecithin found in the plasma membrane is a glycolipid
(ii) Saturated fatty acids possess one or more C = C bonds
(iii) Gingely oil has lower melting point, hence remains as oil in winter
(iv) Lipids are generally insoluble in water but soluble in some organic solvents
(v) When fatty acid is esterified with glycerol, monoglycerides are formed

Choose the correct answer from the options given below:

[4 Marks]

(A) (i), (ii) and (iv) only

(B) (iii), (iv) and (v) only

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

(D) (i), (iv) and (v) only

Question 138.

The anatomy of springwood shows some peculiar features.
Identify the correct set of statements about springwood.
(i) It is also called as the earlywood
(ii) In spring season cambium produces xylem elements with narrow vessels
(iii) It is lighter in colour
(iv) The springwood along with autumnwood shows alternate concentric rings forming annual rings
(v) It has lower density
Choose the correct answer from the options given below:

[4 Marks]

(A) (i), (ii) and (iv) only

(B) (i), (iii), (iv) and (v) only

(C) (iii), (iv) and (v) only

(D) (i), (ii), (iv) and (v) only

Question 139.

Transposons can be used during which one of the following?

[4 Marks]

(A) Gene silencing

(B) Autoradiography

(C) Gene-sequencing

(D) Polymerase Chain Reaction

Question 140.

Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): Mendel's law of independent assortment does not hold good for the genes that are located closely on the same chromosome.
Reason (R): Closely located genes assort independently.
In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) (A) is not correct but (R) is correct

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

(C) (A) is correct but (R) is not correct

(D) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Question 141.

The following palindromic base sequences of DNA, which one can be cut easily by particular restriction enzyme?

[4 Marks]

(A) 5'GAATTC3' ; 3'CTTAAG5'

(B) 5'CTCAGT3' ; 3'GAGTCA5'

(C) 5'GATCAT3' ; 3'CTATGA5'

(D) 5'GTATTC3' ; 3'CATAAG5'

Question 142.

Which one of the following will accelerate phosphorus cycle?

[4 Marks]

(A) Volcanic activity

(B) Weathering of rocks

(C) Rai fall and storms

(D) Burning of fossil fuels

Question 143.

Match the plant with the kind of life cycle it exhibits:

Choose the correct answer from the options given below:

[4 Marks]

4. Match the plant with the kind of life cycle it exhibits.

List-I		List-II	
(A)	Spirogyra	(i)	Dominant diploid sporophyte vascular plant, with highly reduced male or female gametophyte
(B)	Fern	(ii)	Dominant haploid free-living gametophyte
(C)	Funaria	(iii)	Dominant diploid sporophyte alternating with reduced gametophyte called prothallus
(D)	Cycas	(iv)	Dominant haploid leafy gametophyte alternating with partially dependent multicellular sporophyte

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

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

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

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

Question 144.

While explaining interspecific interaction of population, (+) sign is assigned for beneficial interaction, (−) sign is assigned for detrimental interaction and (0) for neutral interaction. Which of the following interactions can be assigned (+) for one species and (−) for another species involved in the interaction?

[4 Marks]

(A) Amensalism

(B) Commensalism

(C) Competition

(D) Predation

Question 145.

Addition of more solutes in a given solution will:

[4 Marks]

(A) lower its water potential

(B) make its water potential zero

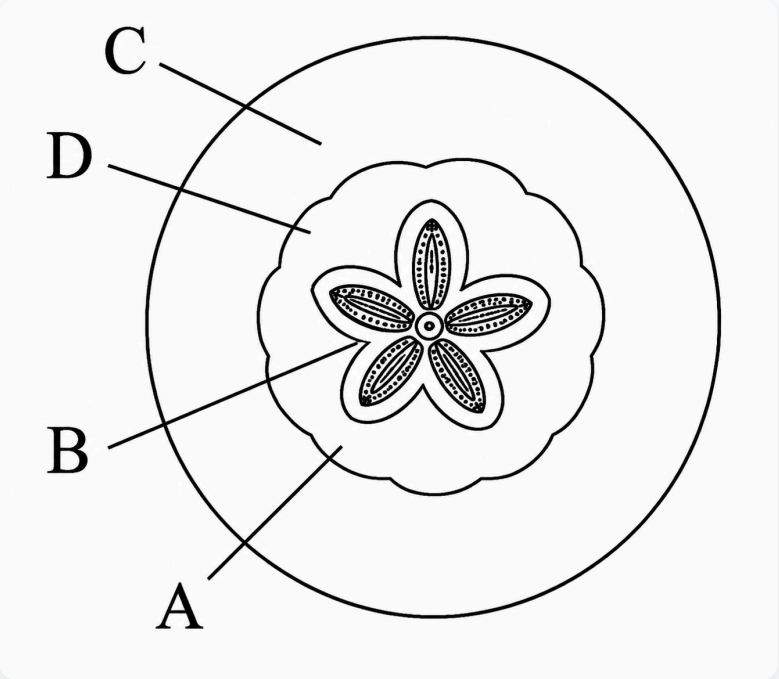
(C) not affect the water potential at all

(D) raise its water potential

Question 146.

Which part of the fruit, labelled in the given figure makes it a false fruit?

[4 Marks]



(A) C → Thalamus

(B) B → Endocarp

(C) A → Mesocarp

(D) D → Seed

Question 147.

Which of the following occurs due to the presence of autosome linked dominant trait?

[4 Marks]

(A) Thalessemia

(B) Sickle cell anaemia

(C) Haemophilia

(D) Myotonic dystrophy

Question 148.

If a geneticist uses the blind approach for sequencing the whole genome of an organism, followed by assignment of function to different segments, the methodology adopted by him is called as:

[4 Marks]

(A) Expressed sequence tags

(B) Gene mapping

(C) Bioinformatics

(D) Sequence annotation

Question 149.

What is the role of large bundle shealth cells found around the vascular bundles in C_4 plants?

[4 Marks]

(A) To increase the number of chloroplast for the operation of Calvin cycle

(B) To provide the site for photorespiratory pathway (1)

(C) To protect the vascular tissue from high light intensity

(D) To enable the plant to tolerate high temperature

Question 150.

Nitrogenous waste is excreted in the form of pellet or paste by:

[1 Marks]

(A) Hippocampus

(B) Pavo

(C) Ornithorhynchus

(D) Salamandra

Question 151.

Select the incorrect statement with reference to mitosis:

[4 Marks]

(A) Spindle fibres attach to centromere of chromosome

(B) Chromosomes decondense at telophase.

(C) Splitting of centromere occurs at anaphase.

(D) All the chromosomes lie at the equator at metaphase.

Question 152.

Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): Osteoporosis is characterised by decreased bone mass and increased chances of fractures.
Reason (R): Common cause of osteoporosis is increased levels of estrogen.
In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) (A) is not correct but (R) is correct

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

(C) (A) is correct but (R) is not correct

(D) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Question 153.

Under normal physiological conditions in human being every 100 ml of oxygenated blood can deliver _____ ml of O_2 to the tissues.

[4 Marks]

(A) 10 ml

(B) 2 ml

(C) 4 ml

(D) 5 ml

Question 154.

A dehydration reaction links two glucose molecules to produce maltose. If the formula for glucose is $C_6H_{12}O_6$, then what is the formula for maltose?

[4 Marks]

(A) $C_{12}H_{24}O_{12}$

(B) $C_{12}H_{22}O_{11}$

(C) $C_{12}H_{20}O_{10}$

(D) $C_{12}H_{24}O_{11}$

Question 155.

In which of the following animals digestive tract has additional chambers like crop and gizzard?

[4 Marks]

(A) Corvus, Columba, Chameleon

(B) Pavo, Psittacula, Corvus

(C) Bufo, Balaenoptera, Bangarus

(D) Catla, Columba, Crocodilus

Question 156.

Given below are two statements:
Statement I: The release of sperms into the seminiferous tubules is called spermiation.
Statement II: Spermiogenesis is the process of formation of sperms from spermatogonia.
In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are correct

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

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

(D) Both Statement I and Statement II are incorrect

Question 157.

Natural selection where more individuals acquire specific character value other than the mean character value, leads to:

[4 Marks]

(A) Disruptive change

(B) Random change

(C) Directional change

(D) Stabilising change

Question 158.

Which of the following statements with respect to Endoplasmic Reticulum is incorrect?

[4 Marks]

(A) In prokaryotes only RER are present

(B) SER are the sites for lipid synthesis

(C) RER has ribosomes attached to ER

(D) SER is devoid of ribosomes

Question 159.

Which of the following is present between the adjacent bones of the vertebral column?

[4 Marks]

(A) Intercalated discs

(B) Areolar tissue

(C) Smooth muscle

(D) Cartilage

Question 160.

Which of the following functions is not performed by secretions from salivary glands?

[4 Marks]

(A) Control bacterial population in mouth

(B) Lubrication of oral cavity

(C) Digestion of disaccharides

(D) Digestion of complex carbohydrates

Question 161.

In an E.coli strain i gene gets mutated and its product can not bind the inducer molecule. If growth medium is provided with lactose, what will be the outcome?

[4 Marks]

(A) z, y, a genes will not be translated

(B) z, y, a genes will be transcribed

(C) Only z gene will get transcribed

(D) RNA polymerase will bind the promoter region

Question 162.

Identify the asexual reproductive structure associated with Penicillium:

[4 Marks]

(A) Buds

(B) Zoospores

(C) Gemmules

(D) Conidia

Question 163.

If the length of a DNA molecule is 1.1 metres, what will be the approximate number of base pairs?

[4 Marks]

(A) 6.6×10^9 bp

(B) 6.6×10^6 bp

(C) 3.3×10^6 bp

(D) 3.3×10^9 bp

Question 164.

Which of the following is not a connective tissue?

[4 Marks]

(A) Neuroglia

(B) Adipose tissue

(C) Cartilage

(D) Blood

Question 165.

Given below are two statements:
Statement I: Restriction endonucleases recognise specific sequence to cut DNA known as palindromic nucleotide sequence.
Statement II: Restriction endonucleases cut the DNA strand a little away from the centre of the palindromic site.

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 incorrect

(D) Both Statement I and Statement II are correct

Question 166.

Detritivores breakdown detritus into smaller particles. This process is called:

[4 Marks]

(A) Catabolism

(B) Decomposition

(C) Fragmentation

(D) Humification

Question 167.

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

(i) It results in the formation of haploid gametes

(ii) Differentiation of gamete occurs after the completion of meiosis

(iii) Meiosis occurs continuously in a mitotically dividing stem cell population

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

(v) It is initiated at puberty

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) (ii), (iv) and (v) only

(B) (ii)and (iii) only

(C) (ii), (iii) and (v) only

(D) (iii) and (v) only

Question 168.

Given below are two statements:
Statement I: Fatty acids and glycerols cannot be absorbed into the blood.
Statement II: Specialized lymphatic capillaries called lacteals carry chylomicrons into lymphatic vessels and ultimately into the blood.
In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are incorrect

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

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

(D) Both Statement I and Statement II are correct

Question 169.

If ‘8’ Drosophila in a laboratory population of ‘80’ died during a week, the death rate in the population is individuals per Drosophila per week.

[4 Marks]

(A) 0.1

(B) zero

(C) 10

(D) 1.0

Question 170.

Given below are two statements:
Statement I: The coagulum is formed of network of threads called thrombins.
Statement II: Spleen is the graveyard of erythrocytes.
In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are correct

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

(C) Both Statement I and Statement II are incorrect

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

Question 171.

Tegmina in cockroach, arises from:

[4 Marks]

(A) Metathorax

(B) Mesothorax

(C) Prothorax and Mesothorax

(D) Prothorax

Question 172.

In the taxonomic categories which hierarchial arrangement in ascending order is correct in case of animals?

[4 Marks]

(A) Kingdom, Phylum, Class, Order, Family, Genus, Species

(B) Kingdom, Order, Phylum, Class, Family, Genus, Species

(C) Kingdom, Class, Phylum, Family, Order, Genus, Species

(D) Kingdom, Order, Class, Phylum, Family, Genus, Species

Question 173.

Identify the microorganism which is responsible. for the production of an immunosuppressive molecule cyclosporin A:

[4 Marks]

(A) Streptococcus cerevisiae

(B) Aspergillus niger

(C) Clostridium butylicum

(D) Trichoderma polysporum

Question 174.

Which of the following is not the function of conducting part of respiratory system?

[4 Marks]

(A) Inhaled air is humidified

(B) Temperature of inhaled air is brought to body temperature

(C) Provides surface for diffusion of O_2 and CO_2

(D) It clears inhaled air from foreign particles

Question 175.

Lippe’s loop is a type of contraceptive used as:

[4 Marks]

(A) Cervical barrier

(B) Copper releasing IUD

(C) Non—Medicated IUD

(D) Vault barrier

Question 176.

Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A): All vertebrates are chordates but all chordates are not vertebrates.Reason (R): Notochord is replaced by vertebral column
in the adult vertebrates.
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) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(C) (A) is not correct but (R) is correct

(D) Both (A) and (R) are correct but (R) is not the correct explanation of (A)

Question 177.

Given below are two statements :
Statement I: Mycoplasma can pass through less than 1 micron filter size.
Statement II: Mycoplasma are bacteria with cell wall.
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) Both Statement I and Statement II are correct

(C) Both Statement I and Statement II are incorrect

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

Question 178.

Regarding Meiosis, which of the statements is incorrect?

[4 Marks]

(A) DNA replication occurs in S phase of Meiosis-II

(B) Pairing of homologous chromosomes and recombination occurs in Meiosis-I

(C) Four haploid cells are formed at the end of Meiosis-II

(D) There are two stages in Meiosis, Meiosis-I and II

Question 179.

In-situ conservation refers to:

[4 Marks]

(A) Conserve only extinct species

(B) Conserve only endangered species

(C) Conserve only high risk species

(D) Protect and conserve the whole ecosystem

Question 180.

At which stage of life the oogenesis process is initiated?

[4 Marks]

(A) Adult

(B) Puberty

(C) Birth

(D) Embryonic development stage

Question 181.

Which of the following is a correct match for disease and its symptoms?

[4 Marks]

(A) Myasthenia gravis - Genetic disorder resulting in weakening and paralysis of skeletal muscle

(B) Arthritis - Inflamed joints

(C) Muscular dystrophy - An autoimmune disorder causing progressive degeneration of skeletal muscle

(D) Tetany - high Ca^{2+} level causing rapid spasms.

Question 182.

Given below are two statements:
Statement I: Autoimmune disorder is a condition where body defense mechanism recognizes its own cells as foreign bodies.
Statement II: Rheumatoid arthritis is a condition where body does not attack self cells.
In the light of the above statements, choose the most appropriate answer from the options given below:

[4 Marks]

(A) Both Statement I and Statement II are incorrect

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

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

(D) Both Statement I and Statement II are correct

Question 183.

In gene therapy of Adenosine Deaminase (ADA) deficiency, the patient requires periodic infusion of genetically engineered lymphocytes because:

[4 Marks]

(A) Lymphocytes from patient's blood are grown in culture, outside the body.

(B) Gene isolated from marrow cells producing ADA is introduced into cells at embryonic stage.

(C) Retroviral vector is introduced into these lymphocytes.

(D) Genetically engineered lymphocytes are not immortal cells.

Question 184.

Breeding crops with higher levels of vitamins and minerals or higher proteins and healthier fats is called:

[4 Marks]

(A) Bio-magnification

(B) Bio-remediation

(C) Bio-accumulation

(D) Bio-fortification

Question 185.

Which one of the following statements is correct?

[4 Marks]

(A) The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria

(B) Blood moves freely from atrium to the ventricle during joint diastole.

(C) Increased ventricular pressure. causes closing of the semilunar valves.

(D) The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction

Question 186.

Select the incorrect statement regarding synapses:

[4 Marks]

(A) The membranes of presynaptic and postsynaptic neurons are in close proximity in an electrical synapse.

(B) Impulse transmission across a chemical synapse is always faster than that across an electrical synapse.

(C) Chemical synapses use neurotransmitters

(D) Electrical current can flow directly from one neuron into the other across the electrical synapse.

Question 187.

Select the incorrect statement with respect to acquired immunity.

[4 Marks]

(A) Acquired immunity is non-specific type of defense present at the time of birth.

(B) Primary response is produced when our body encounters a pathogen for the first time.

(C) Anamnestic response is due to memory of first encounter.

(D) Anamnestic response is elicited on subsequent encounters with the same pathogen.

Question 188.

Match List-I with List-II.

Choose the correct answer from the options given below:

[4 Marks]

List-I (Biological Molecules)	List-II (Biological functions)
(A) Glycogen	(i) Hormone
(B) Globulin	(ii) Biocatalyst
(C) Steroids	(iii) Antibody
(D) Thrombin	(iv) Storage product

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

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

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

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

Question 189.

Match List-I with List-II with respect to methods of Contraception and their respective actions.

Choose the correct answer from the options given
below:

[4 Marks]

List-I		List-II	
(A)	Diaphragms	(i)	Inhibit ovulation and Implantation
(B)	Contraceptive	(ii)	Increase phagocytosis of Pills sperm within Uterus
(C)	Intra uterine	(iii)	Absence of Menstrual Devices cycle and ovulation following parturition
(D)	Lactational	(iv)	They cover the cervix Amenorrhea blocking the entry of sperms

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

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

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

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

Question 190.

Ten E.coli cells with '5N - dsDNA are incubated in medium containing "N nucleotide. After 60 minutes, how many E.coli cells will have DNA totally free from '5N?

[4 Marks]

(A) 40 cells

(B) 80 cells

(C) 20 cells

(D) 60 cells

Question 191.

The recombination frequency between the genes a & c is 5%, b & c is 15%, b & d is 9%, a & b is 20%, c & d is 24% and a & d is 29%. What will be the sequence of these genes on a linear chromosome?

[4 Marks]

(A) a, c, b, d

(B) a, b, c, d

(C) a, d, b, c

(D) d, b, a, c

Question 192.

Given below are two statements:
Statement I: In a scrubber the exhaust from the thermal plant is passed through the electric wires to charge the dust particles.
Statement II: Particulate matter (PM 2.5) can not be removed by scrubber but can be removed by an electrostatic precipitator.

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

[4 Marks]

(A) Both Statement I and Statement II are correct

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

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

(D) Both Statement I and Statement II are incorrect

Question 193.

Statements related to human Insulin are given below.

Which statement(s) is/are correct about genetically engineered Insulin?

(i) Pro-hormone insulin contain extra stretch of C-peptide

(ii) A-peptide and B-peptide chains of insulin were produced separately in E.coli, extracted and combined by creating disulphide bond between them.

(iii) Insulin used for treating Diabetes was extracted from Cattles and Pigs.

(iv) Pro-hormone Insulin needs to be processed for converting into a mature and functional hormone.

(v) Some patients develop allergic reactions to the foreign insulin.

Choose the most appropriate answer from the options given below:

[4 Marks]

(A) (iii), (iv) and (v) only

(B) (i), (ii) and (iv) only

(C) (ii) only

(D) (iii) and (iv) only

Question 194.

Which of the following statements is not true?

[4 Marks]

(A) Sweet potato and potato is an example of analogy

(B) Flippers of penguins and dolphins are a pair of homologous organs

(C) Homology indicates common ancestry

(D) Analogous structures are a result of convergent evolution

Question 195.

Which of the following is not a desirable feature of a cloning vector?

[4 Marks]

(A) Presence of single restriction enzyme site

(B) Presence of a marker gene

(C) Presence of two or more recognition sites

(D) Presence of origin of replication

Question 196.

Which of the following is a correct statement?

[4 Marks]

(A) Mycoplasma have DNA, Ribosome and cell wall.

(B) Cyanobacteria are a group of autotrophic organisms classified under Kingdom Monera.

(C) Slime moulds are saprophytic organisms classified under Kingdom Monera.

(D) Bacteria are exclusively heterotrophic organisms.

Question 197.

Match List-I with List-II

Choose the correct answer from the options given below:

[4 Marks]

List-I		List-II	
(A)	Bronchioles	(i)	Dense Regular Connective Tissue
(B)	Goblet cell	(ii)	Loose Connective Tissue
(C)	Tendons	(iii)	Glandular Tissue
(D)	Adipose Tissue	(iv)	Ciliated Epithelium

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

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

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

(D) (A)-(iii), (B)-(iv), (c)-(ii), (D)-(i)

Question 198.

Which of the following are not the effects of Parathyroid

hormone?

(i) Stimulates the process of bone resorption

(ii) Decreases Ca^{2+} level in blood

(iii) Reabsorption of Ca^{2+} by renal tubules

(iv) Decreases the absorption of Ca^{2+} from digested food

(v) Increases metabolism of carbohydrates

Choose the most appropriate answer from the options

given below:

[4 Marks]

(A) (ii), (iv) and (v) only

(B) (i) and (v) only

(C) (ii) and (iii) only

(D) (i) and (iii) only

Question 199.

If a colour blind female marries a man whose mother was

also colour blind, what are the chances of her progeny

having colour blindness?

[4 Marks]

(A) 25%

(B) 50%

(C) 100%

(D) 75%

Question 200.

A nucleus of mass number 189 splits into two nuclei having mass number 125 and 64. The ratio of radius of two daughter nuclei respectively is:

[4 Marks]

(A) 5 : 4

(B) 25 : 16

(C) 1 : 1

(D) 4 : 5