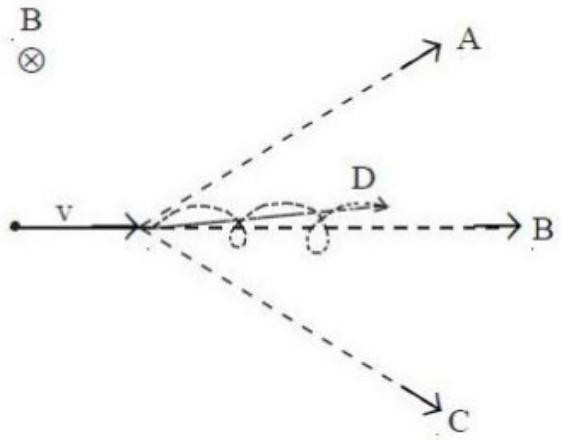
Sample Paper

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Agriculture

Q.No. 1 Consider a negatively charged particle moving with a velocity v in a magnetic field B applied perpendicular to the plane of the paper (into the paper). The panicle follows the path A or B or C or D (shown in the figure)



(A) Path A

(B) Path B

(C) Path C

(D) Path D

Q.No. 2 A conducting spherical bubble of radius 'a' and thickness t (t<<a) has potential V. Now the bubble collapses into a droplets. Find the potential of the droplets.

(A) V(a/3t)

(B) $V(a/3t)^{1/2}$

(C) $V(a/3t)^{1/3}$

(D) None of these

Q.No. 3 Renal portal system is absent in

(A) Fishes and Amphibians

(B) Cyclostomes and Fishes

(C) Reptiles and Birds

(D) Cyclostomes and Mammals

Q.No. 4 The energy of an electron in an orbit of hydrogen like ion with an orbit radius of 59 pm in J is (ground state energy of electron in hydrogen atom is -18×10^{-18}J)

(A) -4.36×10^{-18}

(B) -1.09×10^{-17}

(C) -8.72×10^{-18}

(D) -6.54×10^{-18}

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Q.No. 5 Identify the correct statements from the following (i) $\Delta_f H^{\ominus}$ of graphite is taken as zero (ii) In fullerene. every five carbon ring is fused to six carbon rings only (iii) CO_2 is prepared by dehydrating formic acid using conc. H_2SO_4 at 373 K

(A) i,ii,iii

(B) i,iii only

(C) i,ii only

(D) ii, iii only

Q.No. 6 Arrange the path of electrons from water to the phycocyanin in the light reaction. i) Plastoquinone ii) Excited P680* iii) Cytf vi) Fe-S v) Pheophytin vi) Quinone The correct sequence is

(A) Iii. v, vi, i. ii, iv

(B) ii, v, vi, i, iv, iii

(C) iv, i, iii, vi, v

(D) vi, iv, v, iii, ii, i

Q.No. 7 A parallel plate capacitor with plate area 1 m? and plate separation 1 mm is charged at the rate of 25 Vs-!. The dielectric between the plates has a dielectric constant 'k'. If the displacement current through the capacitor is 2.21 1A then the value of 'k' is nearly

(A) 25

(B) 20

(C) 15

(D) 10

Q.No. 8 A stream of electrons accelerated by a potential difference V falls on the surface of a metal whose inner potential is $V_i = 15V$. Then the refractive index of the metal for the electrons accelerated by a potential difference of r = 150 V is

(A) 1.05

(B) 2.10

(C) 1.50

(D) 1.25

Q.No. 9 A wire is suspended vertically from a rigid support. When loaded with a body in air. the wire extends by 6 mm and when the body is immersed completely in water, the extension is reduced to 4 mm. The relative density of material of the body is

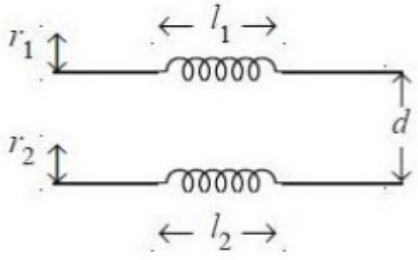
(A) 3/2

(B) 3

(C) 2

(D) ⅔

Q.No. 10 Consider two coils of radii r, and h. placed at a distance 'd ' away as shown in the figure. Assuming the length of the coils $l_1, l_2 >> d$ with n_1, n_2 , the number of tums per unit length of the two coils respectively. the mutual inductance of the two coils is



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(A) $\mu_o n_1 n_2 \pi r_1^2 l$

(B) $\frac{\mu_o n_1 n_2 \pi r_1 r_2 l_1 l_2}{d}$

(C) $\frac{\mu_o n_1 n_2 \pi r_1^2 l_1 l_2}{d}$

(D) Zero

Q.No. 11 Identify the set of species having same bond order

(A) B_2, N_2, O_2^-

(B) N_2, N_2^+, F_2

(C) O_2^{2-}, B_2, F_2

(D) O_2^{2-}, B_2, N_2^+

Q.No. 12 Under which of the following conditions E value of the cell for the cell reaction given is maximum ?

(A) C_1 = 0.1 M, C_2 = 0.01 M

(B) C_1 = 0.1 M, C_2 = 0.03 M

(C) C_1 = 0.1 M, C_2 = 0.02 M

(D) C_1 = 0.2 M, C_2 = 0.01 M

Q.No. 13 In Young's double slit experiment, if the slit separation is twice the wavelength of light used. then the maximum number of interference maxima is

(A) 0

(B) 3

(C) 5

(D) 7

Q.No. 14 Oriented locomotor movement of an organism towards or away from light source is called

(A) Photokinesis

(B) Phototropism

(C) Phototaxis

(D) Photoperiodism

Q.No. 15 Two particles P and Q each of mass 3m lie at rest on the X-axis at the points (-a, 0) and (+a,0) respectively. A third particle R of mass 2m initially at the origin moves towards particle Q. If all the collisions of the system of 3 panicles are elastic and head-on. the total number of collisions in the system is

(A) 2

(B) 3

(C) 4

(D) 5

Q.No. 16 The soft silvery metallic element which ionizes easily when heated or exposed to light and is present in atomic clocks is

(A) calcium

(B) cesium

(C) cerium

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(D) barium

Q.No. 17 Assertion (A) : Sodium chloride is dissolved in water and this solution will have a lower water potential than pure water. Reason (R) : The Ψ_s is always positive in comparison with pure water. Which of the following is true?

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

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

(C) (A) is true, but (R) is false

(D) (A) is false, but (R) is true

Q.No. 18 Phosphorus reacts with sulphuryl chloride to form PCI_5 and X. Hot and concentrated H_2SO_4 reacts with Cu to form CuSO4, H_2O and Y. Zinc sulphide reacts with oxygen to form ZnO and Z. Then X. Y and Z are respectively

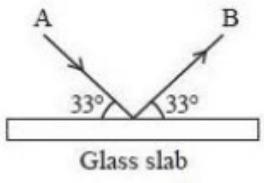
(A) SO_2, SO_2, H_2S

(B) SO_2, SO_2, SO_2

(C) SO_2, H_2S, SO_2

(D) SO_3, SO_2, SO_3

Q.No. 19 A beam of light is incident on a glass slab of refractive index 1.54 in a direction as as shown in the figure. The



reflected light is analysed by a polaroid prism. On rotating the polaroid (tan 57° = 1.54)

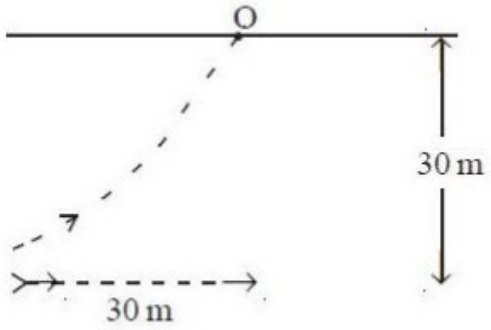
(A) The intensity remains unchanged

(B) The intensity is reduced to zero and remains at zero

(C) The intensity gradually reduces to zero and then increases

(D) The intensity increases gradually

Q.No. 20 A diver. 30 m below water surface is trying to shine a torch light towards the point O which is horizontally 30 m away The amount and direction in which diver has to swim (in the figure) so that the light can not travel outside the surface of water is



(Refractive index of water = 4/3)

(A) 4 m to the left

(B) 4 m to the right

(C) 3.5 m to the right

(D) 3.5 m to the left

Q.No. 21 A solid conducting sphere of radius 20 cm is enclosed by a thin metallic shell of radius 40 cm. A charge of 40 μC is given to the inner sphere. If the metallic shell is earthed, then the heat generated in the process is

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(A) 18 J

(B) 9 J

(C) 36 J

(D) 1.8 J

Q.No. 22 Fill up the blanks with suitable words The ability of the pistil to recognise pollen is dependent on _____ guide the entry of pollen tube. This study leads to help _____ in getting _____ even in _____. [A] Chemicals [B] Plant breeders [C] hybrids [D] Incompatible pollination [E] Synergids

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

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

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

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

Q.No. 23 $[ML_6]^{n+}$ is an octahedral complex. Its crystal field splitting energy (Δ_0) is 1.8 eV. If same metal ion (M^{n+}) forms a tetrahedral complex with same ligands (L) then the crystal field splitting energy (Δ_t) of $[ML_6]^{n+}$ in eV is

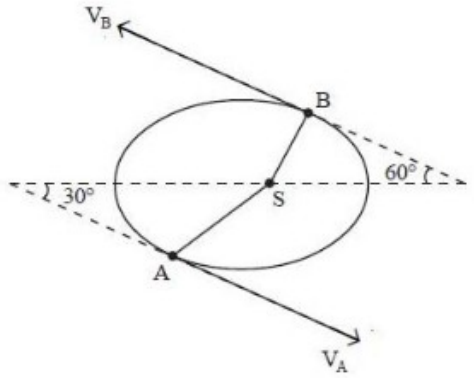
(A) 1.8

(B) 0.8

(C) 4.05

(D) 0.9

Q.No. 24 A planet is revolving around the sun as shown in the figure. The radius vectors joining the sun and the planet at points A and B are 90 x 10^6 km and 60 x 10^6 km respectively. The ratio of velocities of the planet at A and B when its velocities make



30° and 60° with major axis of the orbit is

(A) $\frac{3}{2\sqrt{3}}$

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

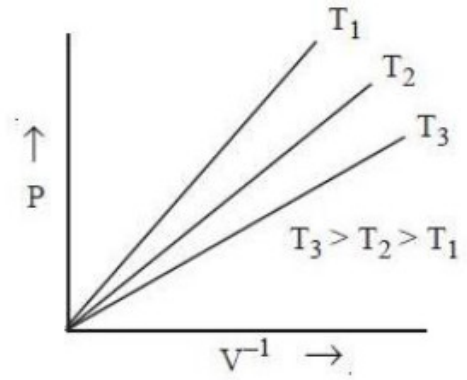
(C) $\frac{1}{\sqrt{3}}$

(D) $\frac{\sqrt{3}}{2}$

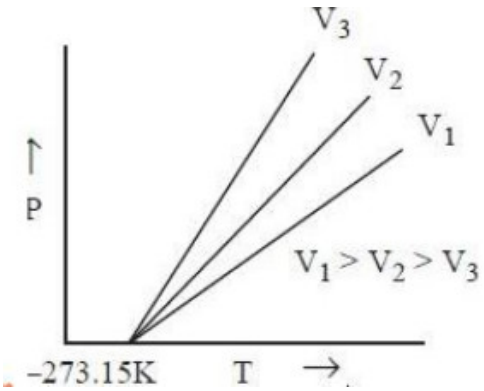
Q.No. 25 Which one of the following plots is correct for the behaviour of ideal and real gases?

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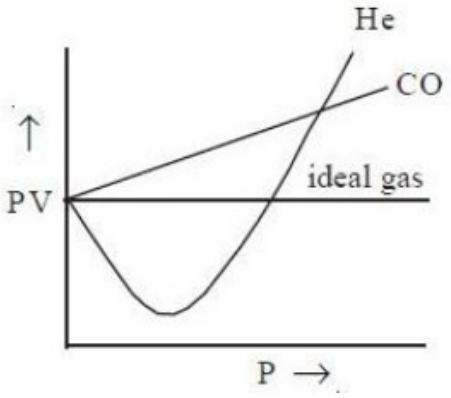
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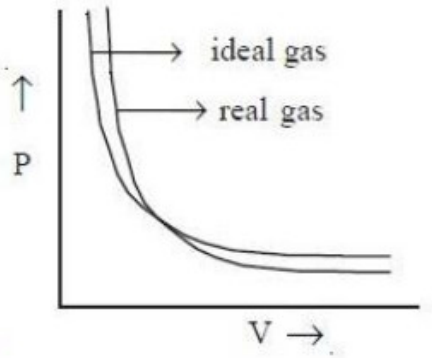
(A)



(B)



(C)



(D)

Q.No. 26 The mole fractions of benzene and toluene vapours in equilibrium with the ideal solution of benzene in toluene at 300 K are 0.61 and 0.39 respectively. The total vapour pressure of the solution is 41 mm Hg. If the vapour pressures of pure benzene and toluene at 300 K are 50 and 32 mm Hg respectively. the mole fractions of benzene and toluene in solution respectively are

(A) 0.25, 0.75

(B) 0.75, 0.25

(C) 0.30, 0.70

(D) 0.50, 0.50

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Q.No. 27 The formation of the Enzyme - Substrate complex is essential for

(A) catalysis

(B) chelation

(C) elicition

(D) anabolism

Q.No. 28 Which of the following produces testosterone?

(A) Primordial germ cells

(B) Leydig cells

(C) Prostate gland

(D) Bulbourethral gland

Q.No. 29 What is the order of events that occur in a bacteriophage lytic cycle?

(A) penetration attachment biosynthesis maturation release

(B) attachment penetration biosynthesis maturation release

(C) release penetration attachment biosynthesis maturation

(D) attachment biosynthesis maturation penetration release

Q.No. 30 In Dumas method one gram of carbon compound gives 50 mL of N_2 at 300 K and 740 mm Hg pressure, If the aqueous tension at 300 K is 15 mm Hg, what is the percentage of nitrogen in it?

(A) 5.42

(B) 10.84

(C) 21.68

(D) 2.71

Q.No. 31 6 g of graphite is burnt in a bomb calorimeter at 25 °C and 1 atm pressure. The temperature of water increased from 25 °C to 31 °C. If ΔH of this reaction is -248 kJ mol^{-1} find out C_v(in kJ mol^{-1}) of the bomb calorimeter.

(A) 20.667

(B) 41.33

(C) 1488

(D) 0.145

Q.No. 32 First reaction in electron transport of Photosynthesis

(A) Photosystem II Chl a absorb light of 680 nm and transport e^- to cytochrome

(B) Photosystem I Chl a absorb light of 700 nm and transport e^- to pheophytin

(C) Photosystem II Chl a absorb light of 680 nm and excite e^- from atomic nucleus to farther orbit

(D) Photo system I Chl a absorb light of 700 nm and transport e^- to cytochrome

Q.No. 33 Conversion of molecular oxygen to ozone takes place only to the extent of 15%. Calculate the mass (in g) of ozone that is formed from 67.2 L of oxygen at STP

(A) 96

(B) 64.1

(C) 14.4

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(D) 22.4

Q.No. 34 Arrange the sequences in enzyme action [A] Product releases and free enzyme again binds to another substrate molecule [B] Enzyme to alter its shape [C] Substrate binds to active site of enzyme [D] Fits in to the active site [E] Formation of enzyme product complex The correct answer is

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

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

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

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

Q.No. 35 A thin bar magnet oscillates with a time period T. If it is cut into two equal pieces 'ons its axis, time period of oscillation of each piece is

(A) T

(B) 2 T

(C) T/2

(D) T/4

Q.No. 36 Example for a monadelphous androecium is

(A) Pisum

(B) Solanum

(C) Dracaena

(D) Crotalaria

Q.No. 37 Assertion [A]: Unlike coconut. groundnut consume endosperm completely during embryo development Reason [R]: Though the embryogeny is similar in groundnut and coconut, perisperm is seen in coconut.

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

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

(C) [A] is true but [R] is false

(D) [A] is false but [R] is true

Q.No. 38 A solid copper cube of 7 cm edge is subjected to a hydraulic pressure of 8000 KPa. Tile volume contraction of the copper cube is (Bulk modulus of copper = 140 GPa)

(A) $16 \times 10^{-3} cm^3$

(B) $19.6 \times 10^{-6} cm^3$

(C) $19.6 \times 10^{-3} cm^3$

(D) $196 \times 10^{-3} cm^3$

Q.No. 39 Dichogamy and herkogamy are the important devices or modifications to prevent one of the following:

(A) Asexual reproduction

(B) Cross pollination

(C) Autogamy

(D) Vegetative propagation

Q.No. 40 In an ecosystem each organism occupies a particular place and has a frictional role and it is known as

(A) Habitat

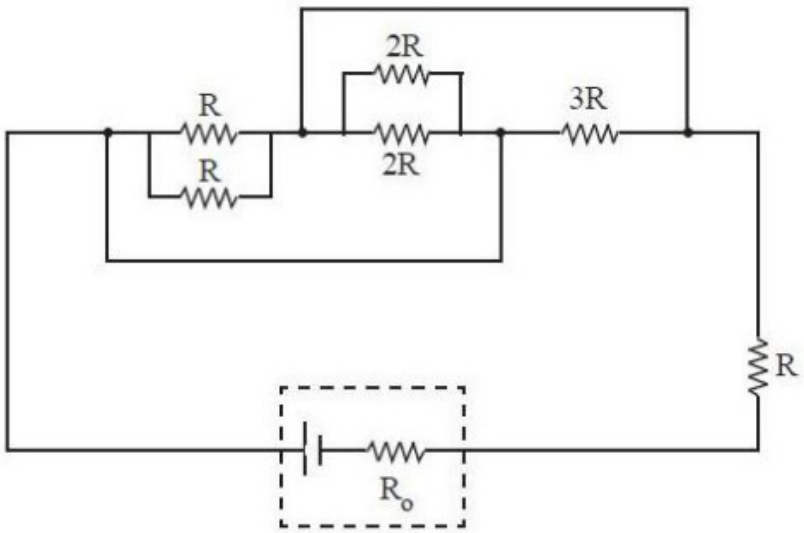
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(B) Ecotone

(C) Ecological Niche

(D) Ecological Pyramid

Q.No. 41 A DC source with internal resistance Ro is connected to circuit as shown in the figure. The value of R for which the



power generated in the circuit is the maximum is

(A) $\frac{16}{13}R_\circ$

(B) $\frac{10}{13}R_0$

(C) $\frac{13}{10}R_o$

(D) $\frac{3}{4}R_\circ$

Q.No. 42 Identify the correct statements from the following. [1] Sulphur sol is an example of a multimolecular colloid. [2] Tyndall effect is observed when the diameter of the dispersed particles is not much smaller than the wavelength of the light used. [3] The process of removing a dissolved substance from a colloidal solution by means of diffusion through a suitable membrane is called peptization. [4] Eosin. gelatin are examples of negatively charged sols.

(A) 1,2,3

(B) 1,2,4

(C) 1,3,4

(D) 2,3,4

Q.No. 43 The focal length of a spherical mirror made of steel is 150 cm. If the temperature of the mirror increases by 200 K, its focal length becomes (coefficient of linear expansion of steel = 12 x 10^{-6} °C^1)

(A) 186.3 cm

(B) 153.6 cm

(C) 150.036 cm

(D) 150.36 cm

Q.No. 44 The length and diameter of a cylinder are measured to be 10.1031 cm and 2.0935 cm respectively. The volume of the cylinder to an appropriate significant figures is

(A) 139.04 cm3

(B) 34.76 cm3

(C) 134.75 cm3

(D) 46.35 cm3

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Q.No. 45 Match the following

	List - I		List - II		List -III
A)	False septum in Ovary	i)	Fig	I)	Storage of food and respiration
B)	Carrot root	ii)	Banana	II)	Length of Stamen filament varies
C)	Sucker	iii)	Mustard	III)	Sub aerial stem modification
D)	Hypanthodium	iv)	Absorption	IV)	Blastophaga

(A) A-ii,II B-iii,III C-i,IV D-iv,I

(B) A-iii,I B-ii,III C-iv,IV D-i,II

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

(D) A-iii,II B-iv,I C-ii,III D-i,IV

Q.No. 46 1g of an organic compound containing C and H. on complete combustion produced 3.04 g of CO_2 and 1.53 g of H_2O . Find the approximate percentage composition of C and H in the compound ?

(A) C%=83 , H%=17

(B) C%=80 , H%=20

(C) C%=85 , H%=15

(D) C%=88 , H%=12

Q.No. 47 When an inductor of inductance $\frac{6}{\pi}$H a capacitor of capacitance $\frac{50}{\pi}\mu$F and resistor of resistance R are connected in series with an ac supply of rms voltage 220 V and frequency 50 Hz, the rms current through the circuit is 440 mA. Match the inductive reactance (X_L). the capacitive reactance (X_c), the resistance (R) and the impedance (Z) of the circuit given in list- I

	List - I జాబితా-I		List - II జాబితా-II
A)	X_L	I)	200 Ω
B)	X_C	II)	300 Ω
C)	R	III)	500 Ω
D)	Z	IV)	600 Ω

with the corresponding values given in list-II.

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

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

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

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

$$RCHO \xrightarrow{X} A \xrightarrow{Y} RCN$$

Q.No. 48 What are X and Y in the following reactions?

X	Y
$C_6H_5SO_2Cl$ / C_5H_5N / 343 K	NH_2OH

(A)

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X	Y
$NaNO_2 / HCl$	$(CH_3CO)_2O$

(B)

X	Y
NH_2OH	$C_6H_5SO_2Cl / C_5H_5N / 343\ K$

(C)

X	Y
$Cu / 573\ K$	$(CH_3CO)_2O$

(D)

Q.No. 49 In watermelon the spirally coiled stem modifications which help in climbing are developed

(A) Apical bud

(B) epidermis bud

(C) Adventitious bud

(D) embryo

Q.No. 50 Epidermal hairs of shoot system I. Unicellular or Multicellular II. Multicellular, branched or unbranched III. Secretary in function IV. Absorbs water V. Prevent transpiratory water loss

(A) II, III, V

(B) I, III, V

(C) II, III, IV

(D) I, IV, V

Q.No. 51 What is the approximate volume (in L) of 0.02 M $KMnO_4$, solution required to completely react with 0.5 L of 10 vol H_2O_2 solution in acid medium?

(A) 89.29

(B) 44.64

(C) 4.464

(D) 8.929

Q.No. 52 A solid 'X' on reaction with dil HCl liberates a gas 'Y' , which decolourises acidified $KMnO_4$ X, Y respectively are

(A) Na_2S, SO_2

(B) Na_2SO_3, SO_2

(C) Na_2SO_4, SO_2

(D) Na_2SO_3, H_2S

Q.No. 53 2 moles of an mono atomic ideal gas at $25^\circ C$ heated reversibly at constant pressure of 2 atm to a final temperature of $125^\circ C$. Calculate the $\Delta H\ (C_v = \frac{3}{2}R)$

(A) $500R$

(B) $-500R$

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(C) 250R

(D) $-250R$

Q.No. 54 Assertion [A] : Persons with O group of blood are called universal donors Reason [R] : Their blood plasma contains both antigen A and antigen B

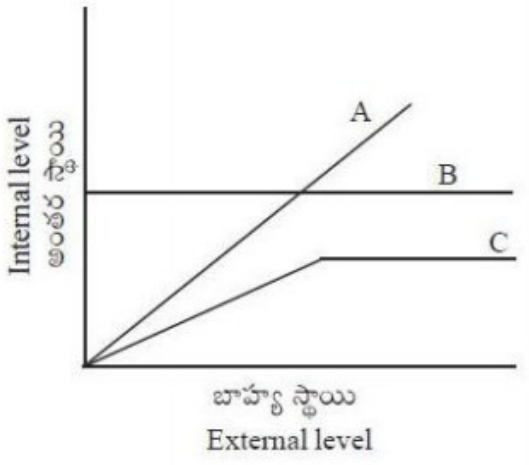
(A) Both [A] and [R] are true and [R] is the correct explanation of [A]

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

(C) [A] is true but [R] is false

(D) [A] is false but [R] is true

Q.No. 55 With reference to temperature adaptations, identify A, B, C of the following graph



(A) A - Regulators, B - Partial Regulators, C - Conformers.

(B) A - Partial Regulators, B - Regulators, C - Conformers.

(C) A - Conformers, B - Regulators, C - Partial Regulators.

(D) A - Regulators, B - Conformers, C - Partial Regulators.

Q.No. 56

Study the following statements [I] Camels are partial regulators or partial conformers [II] In the limnetic zone of a lake. decomposers are almost absent [III] Ten percent law for the transfer of energy from one trophic level to the next was proposed by Elton [IV] The natural reservoir of phosphorus is sea [V] In case of parasitic food chain. the pyramid of number is inverted.

Among the above, the incorrect statements are:

(A) III,V

(B) II,III

(C) III,IV

(D) IV,V

Q.No. 57 A particle of mass 1 kg carrying a charge of 0.01 C is able to remain at rest on a rough inclined plane of inclination 30° when a uniform horizontal electric field of $\frac{490}{\sqrt{3}}\mathrm{Vm}^{-1}$ is applied to the Coefficient of friction is (Acceleration due to gravity = 9.8 ms^{-2})

(A) 0.5

(B) $\frac{1}{\sqrt{3}}$

(C) $\frac{\sqrt{3}}{7}$

(D) $\frac{\sqrt{3}}{2}$

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List - I		List - II	
A)	*Plasmodium malariae*	I)	Malignant tertian malaria
B)	*Plasmodium falciparum*	II)	Mild tertian malaria
C)	*Plasmodium vivax*	III)	Quartan malaria
D)	*Plasmodium ovale*	IV)	Dum dum fever
		V)	Benign tertian malaria

Q.No. 58 Match the following
The correct answer is

(A) A-III B-IV C-V D-II

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

(C) A-III B-I C-V D-II

(D) A-II B-V C-I D-III

Q.No. 59 A steady current I flows down a long rod of radius 'a ' in such a way that its current density $\vec{J} = kr^2\hat{r}$, where k is a positive constant of appropriate dimensions, 'r' is the radial distance from the axis and $\hat{r}$ is the unit vector along the radial direction. Then the magnitude of the magnetic field at any point r (r < a) inside the rod is

(A) $\frac{\mu_o Ir}{\pi a^2}$

(B) $\frac{\mu_o Ir^2}{2\pi a^3}$

(C) $\frac{\mu_o Ia^2}{\pi r^3}$

(D) $\frac{\mu_o Ir^3}{2\pi a^4}$

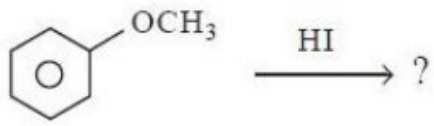
Q.No. 60 A standing wave pattern can be represented by an equation like

(A) $y(x,t) = 2A\sin(kx - \omega t)$

(B) $y(x,t) = A\sin(kx - \omega x) + A\cos(kx - \omega t)$

(C) $y(x,t) = A\sin kx\cos\omega t$

(D) $y(x,t) = A\sin(kx + \omega t) + A\cos(kx - \omega t)$



Q.No. 61 What are the products formed in the following reaction?

(A) Phenol, methyl iodide

(B) Phenyl iodide. methanol

(C) Diphenyl ether. methyl iodide

(D) Diphenyl ether, methanol

Q.No. 62 Choose the correct statement [A] Difference between C^4 and CAM patlnvay is the CO^2 fixation and Calvin cycle are separated in space and time respectively [B] Aldolase combines two 3-carbon compounds as well as one 4-carbon and one 7-carbon compound [C] Based on the labelled carbon studies CO_2 fixation products were identified [D] Stroma lamella and Grana lamella are identical in the distribution of the photosystems

(A) A,C

(B) B,C

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(C) A,D

(D) B,D

Q.No. 63 The order of stability for the super oxides is

(A) $KO_2 > RbO_2 > CsO_2$

(B) $CsO_2 > RbO_2 > KO_2$

(C) $CsO_2 > KO_2 > RbO_2$

(D) $RbO_2 > KO_2 > CsO_2$

Q.No. 64 Choose the correct combination

	List - I		List - II		List -III
A)	Raceme	i)	Cup shapped thallamus	I)	*Derris indica*
B)	Mathematical model	ii)	Codes	II)	Use of computers
C)	Trimerous	iii)	Species plantarum	III)	Artificial System
D)	Historia plantarum	iv)	Capsule	IV)	*Allium*

The correct answer

(A) A,D

(B) B,D

(C) A,C

(D) A,B

Q.No. 65 Assertion [A] : DNA from Bacteriophage head passes through tail core through plasma membrane and enters bacterial cell Reason [R] : Plasma membrane of the host ceII gets dissolved due to lysozyme and releases the new virions

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

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

(C) [A] is true but [R] is false

(D) [A] is false but [R] is true

Q.No. 66 A coil having 200 tums is placed in a magnetic field of $60e^{-200t}$T with its plane perpendicular to the magnetic field. The cross sectional area of the coil is $5e^2cm^2$. The ends of the coil are connected to 100 Ω resistance. The current in the coil at t= 0.01 second is

(A) 6 A

(B) 12 A

(C) 18 A

(D) 24 A

Q.No. 67 Assertion [A] : During transcription both the strands of DNA are copied Reason [R] : If both strands act as template DNA would for RNA molecule with different sequences

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

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

(C) [A] is true but [R] is false

(D) [A] is false but [R] is true

Q.No. 68 In Young's double slit experiment. two slits are made apart at 3 mm and the screen is placed 50 cm away. The fringe width when light of frequency 5×10^{14}Hz used is (Given $c = 3 \times 10^8 m/s$)

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(A) $0.36 \times 10^{-8}\mathrm{m}$

(B) $1 \times 10^{-4}\mathrm{m}$

(C) $2.77 \times 10^{-4}\mathrm{m}$

(D) $1 \times 10^{-2}\mathrm{m}$

Q.No. 69 Assertion (A) : Euglenoids have a flexible body. Reason (R) : They have a protein rich layer called pellicle. which makes their body flexible. Which of the following is true?

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

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

(C) (A) is true, but (R) is false

(D) (A) is false, but (R) is true

Q.No. 70 Assertion [A] : Daphnia exhibits cyclomorphosis Reason [R] : It is an adaptation for Daphnia to lead benthic life

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

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

(C) [A] is true but [R] is false

(D) [A] is false but [R] is true

Q.No. 71 The radius of a soap bubble is r and the surface tension of the soap solution is S. The electric potential to which the soap bubble be raised by charging it so that the pressure inside the bubble becomes equal to the pressure outside the bubble is ($\in$- permittivity of free space)

(A) $\sqrt{\frac{Sr}{8\epsilon_0}}$

(B) $\sqrt{\frac{Sr}{4\epsilon_0}}$

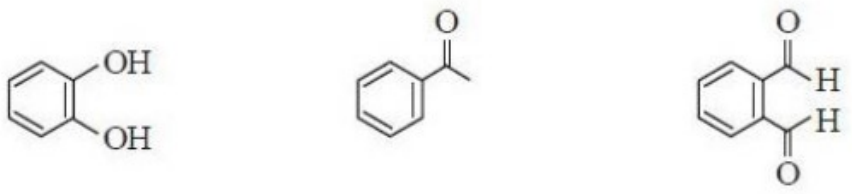
(C) $\sqrt{\frac{4Sr}{\epsilon_0}}$

(D) $\sqrt{\frac{8Sr}{\epsilon_0}}$

Q.No. 72 Structures of catechol (I), propiophenone (II) and phthalaldehyde (II) are

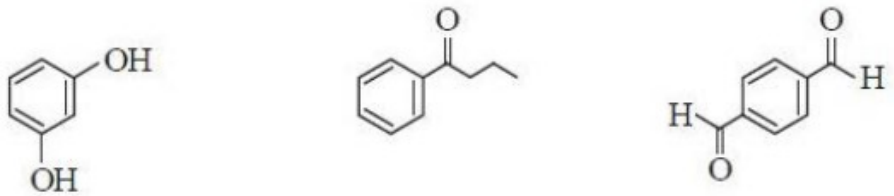
(A)

I II III



(B)

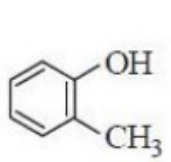
I II III

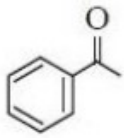


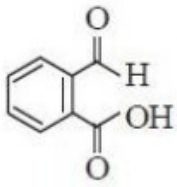
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I II III

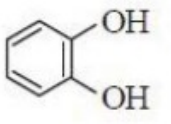


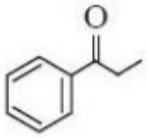


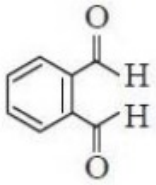


(C)

I II III







(D)

Q.No. 73 In an oscillating LC circuit. the maximum charge on the capacitor is Q The charge on the capacitor when the energy is stored equally between the electric and magnetic fields is

(A) Q/2

(B) $\frac{Q}{\sqrt{3}}$

(C) Q

(D) $\frac{Q}{\sqrt{2}}$

Q.No. 74 A gas expands with temperature according to the relation $V = kT^{2/3}$, where k is a constant. Work done when the temperature changes by 60 K is (R-Universal gas constant)

(A) 10 R

(B) 20 R

(C) 50 R

(D) 40 R

Q.No. 75 Statement(S) : Less than 2% of the human genome encodes for functional units called 'proteins ' Reason (R) : Majority of the human genome is regulatory in nature Which of the following is true?

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

(B) Both (S) and (R) are tnte, but (R) is not the correct explanation of (S)

(C) (S) is true, but (R) is false

(D) (S) is false, but (R) is true

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Q.No. 76 Match the following:

List - I	List - II
(a) First clinical gene Therapy	(i) DNA Amplification
(b) Transfection	(ii) Introduction of genetically modified DNA into a Eukaryotic cell
(c) Synthetic oligode oxynucleosides	(iii) Adenosine deaminase
(d) PCR	(iv) Silencing genes

The correct answer is

(A) (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

(B) (a)-(i), (b)-(iii), (c)-(ii), (d)-(iv)

(C) (a)-(iii), (b)-(ii), (c)-(iv), (d)-(i)

(D) (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Q.No. 77 The inflorescence found in Jasmine is a

(A) Polychasial cyme

(B) Cymule

(C) Dichasial cyme

(D) Monochasial cyme

Q.No. 78 Object moves uniformly with a constant speed v to reach object B. while B in tum moves rectilinearly with a uniform velocity of u < v. At the initial moment v is perpendicular to u and the positions are separated by a distance l. The object A meets the object B at time t. The value of 't' is

(A) $\frac{vl}{(u^2-v^2)}$

(B) $\frac{ul}{(u^2-v^2)}$

(C) $\frac{ul}{(v^2-u^2)}$

(D) $\frac{\mathrm{v}l}{\mathrm{v}^2-u^2}$

Q.No. 79 Choose the collect statements [A] Early detection of pathogen presence can be done by PCR [B] Biochemical products produced by bacteria are inferior to products produced in transgenic plants [C] Validity of the GM Research will be controlled by Genetic Engineering Approval Committee [D] Use of bio resources by multinational companies with proper authorization is not possible

(A) B,C

(B) A,B

(C) B,D

(D) A,C

Q.No. 80 Two carnot engines A and B are connected in series in such a way that the work outputs are equal when the temperatures of hot and cold reservoirs of A are 800 K and T, and of engine B are T and 300 K, respectively Then the temperature T is

(A) 400 K

(B) 450 K

(C) 500 K

(D) 550 K

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Q.No. 81 A motor engine pumps 1800 litre of water per minute from a well of depth 30 m and allows to pass through a pipe of cross sectional area 30 cm^2 . Then the power of the engine is (Acceleration due to gravity = 10 ms^{-2})

(A) 20.5 kW

(B) 15.5 kW

(C) 10.5 kW

(D) 9.5 kW

Q.No. 82 An electromagnetic wave of frequency 1 x 10^{14} Hz is propagating along the Z-axis. The amplitude of electric field is 4 Vm^{-1} , then energy density of electric field will be (Permittivity of force space = 8.8 x 10^{-12} C^2 N^{-1} m^{-2})

(A) 2 x 10^{-13} Jm^{-3}

(B) 70.4 x 10^{-13} Jm^{-3}

(C) 70.4 x 10^{-12} Jm^{-3}

(D) 2 x 10^{-12} Jm^{-3}

Q.No. 83 Assenion (A) : Cellular thickenings at the micropylar tip guide the pollen tubes into the synergids. Reason (R) : Synergids have antipodals located at the chalazal end.

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

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

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

(D) (A) is false, but (R) is true

Q.No. 84 A block of mass 1 kg tied to a long spring of spring constant 100 Nm^{-1} is at rest on a horizontal frictionless surface. The block is pulled through a distance 5 cm from its equilibrium position and released. Then the total energy of the block when it is at a distance 4 cm from the equilibrium position is

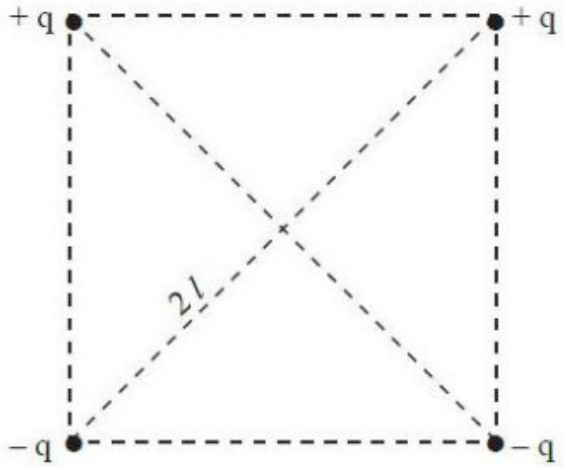
(A) 0.125 J

(B) 12.5 J

(C) 125 J

(D) 1250 J

Q.No. 85 Point charges +q and -q are located at the vertices of a square with diagonals 2l as shown in the figure. The magnitude of the electric field strength at a point. located symmetrically with respect to the vertices of the square at a distance 'x' from its



center is

(A) $\frac{ql}{\left[\sqrt{2}\pi\epsilon_o(l^2+x^2)^{\frac{3}{2}}\right]}$

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(B) $\frac{ql}{\left[\sqrt{2}\epsilon_o(l^2+x^2)\right]}$

(C) $\frac{q}{\left[\sqrt{2}\pi\epsilon_o(l^2+x^2)^{\frac{3}{4}}\right]}$

(D) $\frac{q}{[\pi\epsilon_o(l^2+x^2)]}$

Q.No. 86 The volume of 0.02 M acidified permanganate solution required for complete reaction of 60 mL of 0.01 M $^{-1}$ion solution to form I^2 in mL is

(A) 60

(B) 20

(C) 40

(D) 6

Q.No. 87 Which one of the following does not possess N--N bond?

(A) N_2O_3

(B) N_2O_5

(C) N_2O

(D) N_2O_4

Q.No. 88 Match the following

	List - I		List - II		List -III
A)	*Acacia*	i)	Node of stem	I)	Mericarp
B)	Dichasial cyme	ii)	False septum	II)	Lamiaceae
C)	Lateral out growth	iii)	Monochasial cyme	III)	Photosynthesis
D)	*Argemone*	iv)	Phyllode	IV)	Parietal placentation

The correct answer is

(A) A-iv,I B-iii,II C-i,III D-ii,IV

(B) A-iii,I B-ii,II C-i,IV D-iv,III

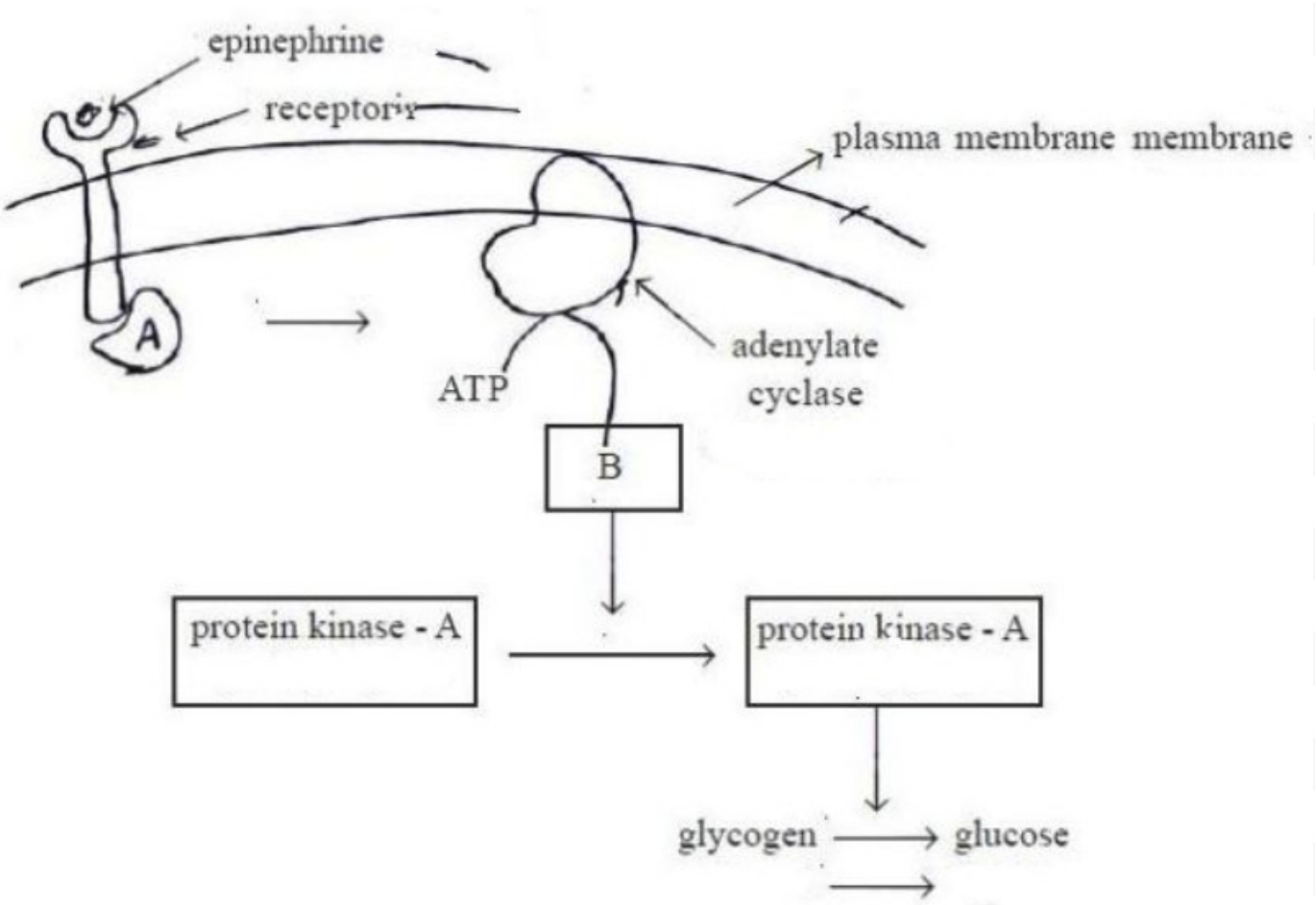
(C) A-iv,I B-ii,II C-iii,III D-i,IV

(D) A-iv,II B-ii,I C-i,IV D-iii,III

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Q.No. 89 In the following hormone response signal transduction pathway, recognize A and B



(A) A - Epinephrine Receptor. B - GTP

(B) A - Epinephrine receptor subunit, B - cAMP

(C) A - G protein. B - GTP

(D) A - G protein. B - cGMP

Q.No. 90 A man standing far from a hill. fires a gun and hears its echo after 4 s. Later he moves 320 m from his initial position away from the hill and fires the gun again and now he hears the echo after 6 s. Then the velocity of the sound in air is

(A) 330 ms^{-1}

(B) 340 ms^{-1}

(C) 320 ms^{-1}

(D) 336 ms^{-1}

Q.No. 91 The wavelength of a microscopic particle of mass 9.1×10^{-31} kg is 182 nm, its kinetic energy in J is ($h = 6.625 \times 10^{-34}$ Js)

(A) 7.28×10^{-23}

(B) 7.28×10^{-24}

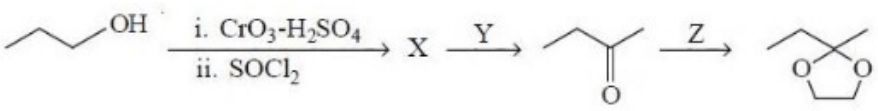
(C) 3.64×10^{-23}

(D) 3.64×10^{-24}

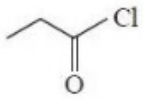
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Q.No. 92 Identify X,Y,Z in the following sequence of reactions



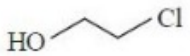
X Y Z

(A) 

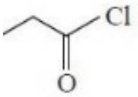
H_3CMgBr

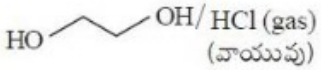

X Y Z

(B) 

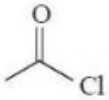
$(CH_3)_2Cd$


X Y Z

(C) 

$(CH_3)_2Cd$


X Y Z

(D) 

$(C_2H_5)_2Cd$


Q.No. 93 In the TCA cycle. conversion of Succinyl - CoA to succinic acid is catalysed by

(A) dehydrogenase

(B) thiokinase

(C) decarboxylase

(D) synthetase

Q.No. 94 The wavelengths of light absorbed by the complexes $[Ni(H_2O)_6]^{2+}$, $[Ni(en)_3]^{2+}$, $[Ni(H_2O)_4en]^{2+}$ are $\lambda_1,\lambda_2,\lambda_3$ respectively. The correct order of wavelength is

(A) $\lambda_1 > \lambda_2 > \lambda_3$

(B) $\lambda_3 > \lambda_2 > \lambda_1$

(C) $\lambda_1 > \lambda_3 > \lambda_2$

(D) $\lambda_2 > \lambda_3 > \lambda_1$

Q.No. 95 Sodium borohydride reacts with I_2 to form Nal, H_2 and X. When X reacts with NaH in diethyl ether; Y is formed. What is Y ?

(A) B_2H_6

(B) H_3BO_3

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(C) B_2O_3

(D) $NaBH_4$

Q.No. 96 Three particles A, B and C simultaneously start from the origin. Particle A moves with a velocity ‘a' along X-axis. particle B moves with a velocity 'b’ along Y-axis and particle C moves with a velocity 'c' in the X-Y plane along the straight line x = y. The magnitude of 'c' so that all the three particles always remain collinear is

(A) a + b

(B) √ab

(C) $\frac{ab}{a+b}$

(D) $\frac{\sqrt{2}ab}{a+b}$

Q.No. 97 Study the following statements [I] The largest endocrine gland of man secretes adrenaline [II] T_H cells are involved in humoral and cell mediated immunity [II] Natural Killer cells are a type of lymphocytes [IV] T_c cells are involved in humoral immunity Pick up the correct statements

(A) I, II

(B) II, III

(C) III, IV

(D) I,IV

Q.No. 98 $KMnO_4$ oxidises S_2O_32- in medium x and NO_2- to NO_3-, in medium y, x and y are respectively.

(A) acidic, basic

(B) acidic, acidic

(C) acidic, neutral

(D) neutral, acidic

Q.No. 99 The radius (in pm) of the 3rd orbit of He is Li^{2+} is respectively

(A) $476.1, 158.7$

(B) $238.05, 158.7$

(C) $0.529, 17.63$

(D) $17.63, 176.3$

Q.No. 100 Which of the following are the characteristic features of phloem? i) Gymnosperms have albuminous cells and sieve cells ii) Presence of tracheids iii) They store food materials in the form of starch or fat. iv) They have sieve tube elements that are long, tube-like structure v) Their end walls are perforated in a sieve like manner.

(A) ii, iii, iv and i

(B) ii, iii and i

(C) i, iv and v

(D) v, ii, iv and iii

Q.No. 101 Assertion (A) : The fragments of DNA generated by the action of restriction endonucleases are separated by polyacrylamide gel electrophoresis. Reason (R) : The separated DNA fragments are visualized as blight orange coloured bands after staining with Ethidium Bromide followed by exposure to UV-radiation. Which of the following is true?

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

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

(C) (A) is true, but (R) is false

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(D) A is false but R is true

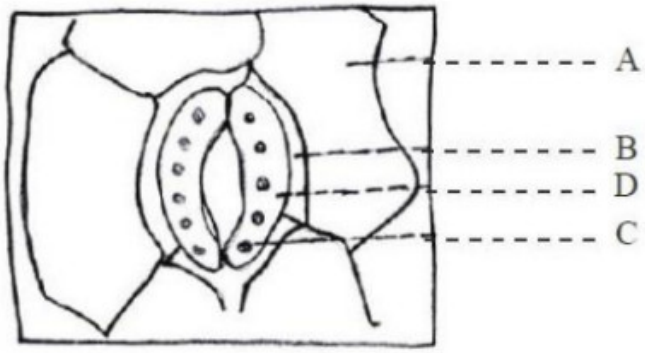
Q.No. 102 The ratio of packing efficiency in fcc, bcc and simple cubic structure respectively. with respect to that of fcc is

(A) 1 : 0.92 : 0.71

(B) 1 : 0.81 : 0.67

(C) 1 : 0.71 : 0.58

(D) 1 : 0.65 : 0.55



Q.No. 103 Study the diagram and the list given below i) Chloroplast ii) Epidermal cell iii) Guard cell iv) Subsidiary cell v) Stomatal pore

(A)

(a)	(b)	(c)	(d)
(ii)	(iv)	(i)	(iii)

(B)

(a)	(b)	(c)	(d)
(ii)	(i)	(iv)	(iii)

(C)

(a)	(b)	(c)	(d)
(v)	(iv)	(i)	(ii)

(D)

(a)	(b)	(c)	(d)
(iv)	(ii)	(iii)	(v)

Q.No. 104 Fibrous membrane in the middle of a sarcomere is

(A) A

(B) I

(C) Z

(D) M

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Q.No. 105 Study the following lists and choose the correct match

	List - I		List - II
A)	Tracheophytic, Archegoniate, Embryophytic, Phanerogams	I)	Angiosperms
B)	Tracheophytic, Archegoniate, Embryophytic, Cryptogams	II)	Gymnosperms
C)	Atracheophytic, Archegoniate, Embryophytic, Cryptogams	III)	Algae
D)	Tracheophytic, Non-archegoniate, Embryophytic, Phanerogams	IV)	Bryophytes
		V)	Pteridophytes

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

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

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

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

Q.No. 106 A 10 litre cylinder contains equal volumes of H_2 and He. If the mixture is allowed to diffuse from an opening. estimate the percent composition of the output gas. (Assume ideal behaviour of gas mixture)

(A) $50\%H_2, 50\%He$

(B) $41\%H_2, 59\%He$

(C) $59\%H_2, 41\%He$

(D) $30\%H_2, 70\%He$

Q.No. 107 Study the following

S. No.	Group	Characters	Examples
I	Urochordata	Tunicin, ventral heart with reverse flow of blood, bisexual, tadpole larva	*Doliolum*
II	Cephalochordata	Solenocytes, ciliary feeding, presence of atrium, closed circulation without heart, gonads with gonoducts	*Branchiostoma*
III	Vertebrata	Paired fins/limbs, ventral heart, kidneys, hepatic portal system	*Bufo*

From the above, the correct combination are

(A) I,II

(B) I,III

(C) II,III

(D) II,only

Q.No. 108 Choose the correct statements [A] Acid soluble fractions have more than one thousand daltons [B] Common acid used in the living cell compound analysis is Hydrochloric acid [C] Number of carbons in Arachidonic acid is 20 [D] Serine is the hydroxy methyl group amino acid The correct answer is

(A) A,B

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(B) B,C

(C) C,D

(D) A,D

Q.No. 109 Which one of the following methods is used to make gold sol?

(A) Ultra filtration method

(B) Peptization method

(C) Electrical disintegration method

(D) Dialysis method

Q.No. 110 20 mL of 0.04M $CuSO_4$, solution reacts completely with 20 mL of certain concentration of KI solution. If I_2, thus liberated reacts completely with 20 mL of sodium thiosulphate solution, the molarity of thiosulfate in mol L^{-1} is

(A) 0.01

(B) 0.02

(C) 0.04

(D) 0.08

Q.No. 111 1 μW of light at 600 nm falls on a metal whose work function is 2 eV The maximum number of electrons that can come out of the metal is

(A) 3.0×10^{12}

(B) 5.5×10^{14}

(C) 2.5×10^{10}

(D) 9×10^{19}

List - I		List - II	
A)	Isogamy	I)	*Plasmodium*
B)	Anisogamy	II)	*Vorticella*
C)	Hologamy	III)	*Astasia*
D)	Conjugation	IV)	*Monocystis*
		V)	*Trichonympha*

Q.No. 112 Match the following

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

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

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

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

Q.No. 113 Which hormone is sprayed to increase the length of stem in sugarcane crop?

(A) Ethylene

(B) Cytokinin

(C) Gibberellin

(D) Methylene

Q.No. 114 In the van-Arkel method of refining Zr, the impurities (x) and the substance (y) used are respectively

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(A) x = (N_2, O_2), y= Cl_2

(B) x = (N_2, O_2), y= O_2

(C) x = (N_2, O_2), y= I_2

(D) x = (SO_2, O_2), y= I_2

Q.No. 115 The velocity of an object moving in a straight line as a function of time by v = 6t- $3t^2$, where v is in ms^{-1}, t is in s. The average velocity of the object between t =0 and t =2 seconds is

(A) 0

(B) 3 ms^{-1}

(C) 2 ms^{-1}

(D) 4 ms^{-1}

Q.No. 116 Pick up the mismatched pair

(A) Gonarrhoea - Neisseria

(B) Syphilis - Treponema

(C) AIDS - HIV

(D) Cervix cancer - Trichomonas

Q.No. 117 A stationary body explodes into four identical fragments such that three of them fly off mutually perpendicular to each other, each with a kinetic energy $\frac{E_0}{2}$. The total energy of explosion is

(A) 6 E_0

(B) 3 E_0

(C) 3 E_0 /2

(D) 2 E_0 /3

Q.No. 118 A long cylindrical glass vessel has a pin hole of diameter 0.2 nun at its bottom. The depth to which the vessel can be lowered vertically in a deep water bath without the water entering into the vessel is (Surface tension of water = 0.07 Nm^{-1} , Acceleration due to gravity = 10 ms^{-2})

(A) 14 cm

(B) 7 cm

(C) 21 cm

(D) 28 cm

Q.No. 119 If the flagellum is provided with two or more rows of lateral appendages and the axoneme ends in a tenninal naked filament, then it belongs to this type

(A) Pantone Matic

(B) Stichonematic

(C) Pantacronematic

(D) Acronematic

Q.No. 120 An earthquake generates both transverse (S) and longitudinal (p) waves in the earth with speeds 4.5 km^{-1} and 8.0 km s^{-1} respectively. A seismograph records that the first P-wave arrives 3.5 minutes earlier than the first S-wave. From the seismograph, the epicentre of the earthquake is located at a distance

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(A) 1080 km

(B) 2468 km

(C) 2160 km

(D) 4320 km

Q.No. 121 A block of 10 kg is sliding at an initial velocity of 10 m/s along the horizontal surface to the right. The surface has a coefficient of kinetic friction 0.3. The distance to which the block will slide before coming to rest is (Assume $g = 10\text{m/s}^2$))

(A) 4.2 m

(B) 5.6 m

(C) 3.8 m

(D) 4.8 m

Q.No. 122 Match the following:

List - I	List - II
(a) Cytozoic parasite	(i) Lives with in the cavities of hosts body
(b) Coelozoic parasite	(ii) Lives between the cells of the tissue and organs of the host
(c) Histozoic parasite	(iii) Lives within the hosts cells
(d) Hyper parasite	(iv) A parasite lives in/on the body of another parasite

(A)

(a)	(b)	(c)	(d)
(iv)	(ii)	(i)	(iii)

(B)

(a)	(b)	(c)	(d)
(iii)	(i)	(ii)	(iv)

(C)

(a)	(b)	(c)	(d)
(i)	(iii)	(ii)	(iv)

(D)

(a)	(b)	(c)	(d)
(iii)	(iv)	(ii)	(i)

Q.No. 123 Choose the wrong statement :

(A) In hydrophilly the pollen pains are covered by mucilaginous layer and in water hyacinth pollination takes place by insects

(B) Nector and pollen are the rewards for animals in pollination but not in Yucca and Amorphopha//us

(C) Autogamy can be prevented by helkogamy and cliestogamous flowers

(D) Wind pollinated flowers will have multi ovule condition for more seed production

Q.No. 124 Lucas reagent is

(A) Br_2/CCl_4

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(B) $KMnO_4/H_+$

(C) HCl/anhydrous $ZnCl_2$

(D) $C_6H_5SO_2Cl$

Q.No. 125 An element has a body-centered cubic structure with a cell edge length of 300 pm. If the density of the element is 7.2 g cm^{-3}, the number of unit cells in 194.4g of the element is

(A) 2.0×10^{24}

(B) 6.0×10^{24}

(C) 3.0×10^{24}

(D) 1.0×10^{24}

Q.No. 126 Assertion [A] : Long neck for Giraffes is due to directional selection Reason [R] : It works constantly removing the individuals from one end and constantly shifting the average value to the other end.

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

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

(C) [A] is true but [R] is false

(D) [A] is false but [R] is true

Q.No. 127 Assertion [A]; Higher order ionization constants (K_{a2} . K_{a3}) are smaller than the lower order ionization constant (K_{a1},1) of polyprotic acid Reason:[R] Polyprotic acid solutions contain a mixture of acids.

(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 correct but [R] is not correct

(D) [A] is not correct but [R] is correct

Q.No. 128 Pteridophytes, especially fems possess the following characteristics i) Circinate vernation ii) Ramenta iii) Eustele iv) Paraphyses The correct combination is

(A) iii & iv

(B) i & ii

(C) i, ii & iv

(D) ii, iii & iv

Q.No. 129 Restriction endonuclease recognises palindromic nucleotide sequences. because they have characteristic

(A) Dyad symmetry

(B) Staggered cut

(C) Direction of expression

(D) Recombinant DNA sequences

Q.No. 130 A series LCR circuit with R = 43 Q and L = 0.5 H has a leading phase angle of 45° at a frequency of 50 Hz. The capacitance used in the circuit is

(A) $15.9\mu F$

(B) $20.2\mu F$

(C) $27.9\mu F$

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(D) 12.3μF

Q.No. 131 Match the following:

List - I	List - II
(a) Villikinin	(i) stimulates the secretion of HCl and pepsinogen
(b) Secretin	(ii) stimulates the secretions of H_2O and HCO_3^-
(c) Gastrin	(iii) stimulates intestinal epitheliar movement to increase nutrient absorption
(d) Cholecystokinin	(iv) stimulates the secretion of pancreatic enzymes and bile juice

(A)

(a)	(b)	(c)	(d)
(iii)	(i)	(ii)	(iv)

(B)

(a)	(b)	(c)	(d)
(iii)	(ii)	(i)	(iv)

(C)

(a)	(b)	(c)	(d)
(iv)	(ii)	(i)	(iii)

(D)

(a)	(b)	(c)	(d)
(ii)	(i)	(iii)	(iv)

Q.No. 132 A hypothetical radioactive element has a half-life of 20 years. The time it takes for 80% of the substance to decay is (ln 5 = 1.6, In 2=0.7)

(A) 30.6 years

(B) 45.7 years

(C) 60.3 years

(D) 80 years

Q.No. 133 The average translational kinetic energy of a molecule in a gas becomes equal to 0.69 eV at a temperature about [Boltzmann constant = 1 .38 x 10^{-23} J K^{-1}]

(A) 3370 °C

(B) 3388 °C

(C) 5333 °C

(D) 5060 °C

Q.No. 134 Study the following statements I. In the wall of veins of man elastic laminae are present on either side of tunica media II. Angina pectoris is due to insufficient supply of blood to heart muscles III. Juxta Glomemlar cells of kidney secrete the enzyme rennin IV. Cellophane membrane of dialyser is impermeable to micro molecules like creatinine Identify the incorrect statements among the above

(A) I,II,III

(B) I,II

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(C) I,III,IV

(D) II,III

Q.No. 135 Which one of the following properties has the same value for H_2 and D_2 ?

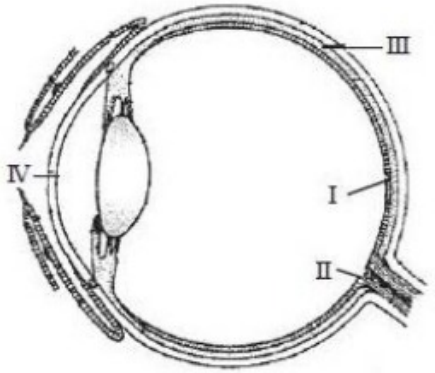
(A) density

(B) enthalpy of bond dissociation

(C) bond length

(D) melting point

Q.No. 136 Observe the following diagram of V.S. of eye and identify the parts I, II, Ill and IV



(A) I- Blind spot II-Fovea III-Choroid IV-Cornea

(B) I-Fovea II-Blind spot III-Choroid IV-Cornea

(C) I-Yellow spot II-Fovea III-Conjunctiva IV-Choroid

(D) I-Blind Spot II-Yellow spot III-Pupil IV-Cornea

Q.No. 137 The wavelength. (in mn) of an electron moving with a velocity of $812 ms^{-1}$ (mass of electron = $9.1 \times 10^{-31} kg$ and Planck's constant = $6.626 \times 10^{-34} Js$) is approximately

(A) 626

(B) 347

(C) 978

(D) 897

Q.No. 138 Which of the following is involved in silencing specific mRNA?

(A) Complementary DNA molecule

(B) Protein template

(C) Cellulose template

(D) Complementary RNA molecule

Q.No. 139 Atom X (in molecule 1) has electrons in 1s. 2s and 2p orbitals. Atom Y (in molecule 2) has electrons in 1s, 2s, 2p, 3s and 3p orbitals. Atom Z (in molecule 3) has electrons in 1s, 2s, 2p. 3 s, 3p. 3d and 4s orbitals. Observe the following statements (i) Atom X can undergo sp, sp^2 and sp^3 type of hybridisation (ii) Atom Y can undergo sp^3, sp^3d type of hybridisation (iii) Atom Z can undergo sp^3d^2, d^2sp^3, dsp^2, sp^3 type of hybridisation The correct statements are

(A) i, ii only

(B) i, iii only

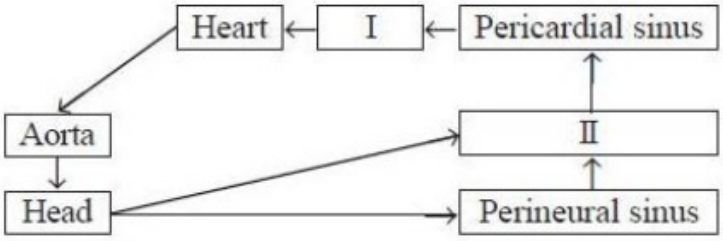
(C) ii, iii only

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(D) i, ii, iiii

Q.No. 140 Study the following regarding blood circulation in cockroach and identify I and II



(A) I-Ostia II-Perivisceral sinus

(B) I-Haemocoel II-Ostia

(C) I-Perivisceral sinus II- Ostia

(D) I-Atria II- Perivisceral sinus

Q.No. 141 The ends of a uniform metal rod of length 100 cm and area of cross-section 2 cm^2 are maintained at 0 °C and 100 °C. At the mid point of the rod. heat is supplied at a constant rate of 40 Js^{-1}. If the temperature gradient on the higher temperature side of the rod in steady state is 50x $°Cm^{-1}$. then the value of x is (Thermal conductivity of the metal = 400 Js^{-1} m^{-1} K^{-1})

(A) 2

(B) 3

(C) 6

(D) 9

Q.No. 142 Match the following

	List - I		List - II
A)	Carcinoma	I)	Cancer of connective tissue
B)	Sarcoma	II)	Cancer of muscular tissue
C)	Leukemia	III)	Cancer of lymphatic system
D)	Lymphoma	IV)	Cancer of epithelial tissues
		V)	Cancer of bone marrow

The correct answer is

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

(B) A-IV B-I C-V D-III

(C) A-IV B-II C-V D-III

(D) A-III B-V C-I D-IV

Q.No. 143 The following equation describes the exponential growth of a population

(A) $\frac{dN}{dt} = rN\frac{K-N}{K}$

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

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

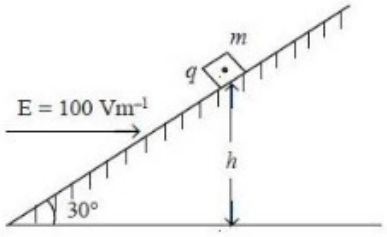
(D) $\frac{dt}{dN} = rN\frac{K}{K-N}$

Q.No. 144 An inclined plane making an angle 30° with the horizontal is placed in a uniform horizontal electric field of 100 Vm^{-1} as shown in figure. A small block of mass 1 kg and charge 0.01 C is allowed to slide down from rest from a height h = 1 m. If

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the coefficient of friction is 0.2, then the acceleration of the block is nearly (Acceleration due to gravity = 10 ms^{-2})



(A) 1.3 ms^{-2}

(B) 2.3 ms^{-2}

(C) 3.3 ms^{-2}

(D) 4.3 ms^{-2}

Q.No. 145 A soccer ball is travelling at a velocity 20 ms^{-1} due south. At the end of its travel. it moves with a velocity 2 ms^{-1} due south. If the change in the linear momentum of the ball is is 18 $kgms^{-1}$ due north. then the mass of the ball is

(A) 3.0 kg

(B) 0.81 kg

(C) 1.0 kg

(D) 0.5 kg

Q.No. 146 Find the wrong statement [A] Polymers of polysaccharides, fats and proteins are synthesised from monomers by ionic bonding [B] Molecules with polar heads and hydrophobic tails are present in cell membrane [C] Left end of protein chain is N-terminal end [D] Right and Left handed helices are observed in protein

(A) A,B

(B) B,C

(C) C,D

(D) A,D

Q.No. 147 Identify the sequence of steps in DNA fingerprinting. a) Isolation of genomic DNA b) Separation by electrophoresis c) Denaturation of DNA d) Hybridization with probe e) Fragmenting DNA with restriction enzymes f) Southem Blotting g) Exposure on film

(A) a b c d e f g

(B) a e b c f d g

(C) a c b e d f g

(D) a e c b f d g

Q.No. 148 Identify correct statements from the following (i) Conventional smog is a mixture of smoke, SO_3 and fog (ii) Conventional smog has oxidizing nature (iii) In the photochemical smog. the unburnt unsaturated hydrocarbons are converted into PAN. acrolein and HCHO (iv) Photochemical smog can be controlled by fixing catalytic converters in automobile engines

(A) i, ii iii, iv

(B) i, ii, iii only

(C) iii, iv only

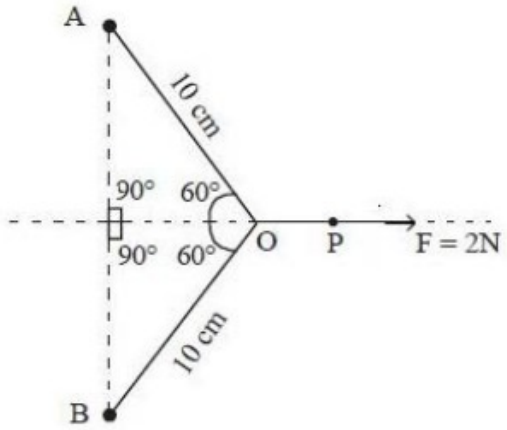
(D) i, ii only

Q.No. 149 Two point objects A and B each of mass 3 and initially at rest are connected by massless threads as shown in the figure. A constant force 2 N acts on the system at point P along OP After the point 'O' has moved a distance 20 cm in the

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direction of force, the objects collide and stick together. The displacement and velocity of the centre of mass of the system



immediately after collision are respectively

(A) 20 cm , 15 ms $^{-1}$

(B) 10 cm , 15 ms $^{-1}$

(C) 15 cm , 10 ms $^{-1}$

(D) 15 cm , 12 ms $^{-1}$

Q.No. 150 A satellite is launched to a distance r from the centre of the earth to have a circular orbit around the earth. Its orbital velocity to maintain this orbital is (mass of the earth as ME)

(A) $\sqrt{\frac{GM_E}{r^2}}$

(B) $\sqrt{\frac{GM_E}{\pi r^2}}$

(C) $\sqrt{\frac{GM_E}{2\pi r}}$

(D) $\sqrt{\frac{GM_E}{r}}$

Q.No. 151 Identify the correct statements from the following (i) CO is an amphoteric oxide (ii) As_2O_3 is a neutral oxide (iii) Cl_2O_7 is an acidic oxide (iv) CaO is a basic oxide

(A) i. ii iii, iv

(B) ii, ii, iv only

(C) iii, iv only

(D) iv, ii only

Q.No. 152 Identify the correct statements from the following. [1] Tendency to form halide hydrates gradually increases from Be to Ba down the group. [2] Tendency to form stable super oxides increases from Li to Cs dovm the group. [3] Low solubility of LiF is due to its high lattice energy.. [4] Solubility of carbonates of group-2 elements increases down the group.

(A) 1, 2

(B) 3, 4

(C) 2, 3

(D) 1, 3

Q.No. 153 Solutions of $CuSO_4$ and $AgNO_3$ were electrolysed with a current of 1.93 amperes for 500 seconds separately. The amounts of copper and silver deposited at cathode respectively in g are

(A) 0.063, 0.54

(B) 0.315, 0.54

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(C) 0.315, 1.08

(D) 1.08, 0.315

Q.No. 154 Statement (S) : Cerebrospinal fluid serves as shock absorbing medium Reason (R) : Cerebrospinal fluid is recycled 4 times per day in order to clear out metabolites and toxins

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

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

(C) (S) is true, but (R) is false

(D) (S) is false, but (R) is true

Q.No. 155 A man of height 7.33 fi releases a stone from the slingshot just above his head. If the stone travels in a vertical direction towards the sky with velocity of 10 ms^{-2}. then the time it takes to reach the ground is (Assume acceleration due to gravity g = 10 ms^{-2})

(A) 1.6 s

(B) 1.8 s

(C) 2.0 s

(D) 2.2 s

Q.No. 156 Statement (S): The amphibian blood is composed of erythrocytes. leukocytes and thrombocytes. The thrombocytes help in haemostasis. Reason (R) : The haemostasis regulates the body temperature in poikilotherms. Which of the following is true?

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

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

(C) (A) is true, but (R) is false

(D) A is false but R is true

Q.No. 157 A colour blind man married a woman who is a daughter of a colour blind father and nonnal homozygous mother. what are the chances of their daughters to become colour blind?

(A) 25 %

(B) 75 %

(C) 100 %

(D) 50 %

Q.No. 158 Examples of fibrous (X) and globular (Y) proteins are

(A) X- insulin Y- albumin

(B) X- Keratin Y- albumin

(C) X- Keratin Y- thyroxine

(D) X- thyroxine Y- insulin

Q.No. 159 A body cools from 80°C to 50°C after a time Interval t. Assuming that the surrounding temperature is 20°C. the temperature of the body after time interval of 2 Δt is

(A) 30°C

(B) 40°C

(C) 25°C

(D) 35°C

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Q.No. 160 In which of the following the electron gain enthalpy of elements is correctly arranged?

(A) S > Se > Te > 0

(B) F > Cl > Br > I

(C) Na > Li > K > Rb

(D) O > S > Se > Te

Answer Sheet

Q.No	Answer
Q.No. 1	(C)
Q.No. 2	(C)
Q.No. 3	(D)
Q.No. 4	(C)
Q.No. 5	(C)
Q.No. 6	(B)
Q.No. 7	(D)
Q.No. 8	(A)
Q.No. 9	(B)
Q.No. 10	(D)
Q.No. 11	(C)
Q.No. 12	(A)
Q.No. 13	(C)
Q.No. 14	(C)
Q.No. 15	(A)
Q.No. 16	(B)
Q.No. 17	(C)
Q.No. 18	(B)
Q.No. 19	(C)
Q.No. 20	(A)
Q.No. 21	(A)
Q.No. 22	(B)
Q.No. 23	(B)
Q.No. 24	(B)
Q.No. 25	(D)
Q.No. 26	(D)
Q.No. 27	(A)
Q.No. 28	(B)
Q.No. 29	(B)
Q.No. 30	(A)
Q.No. 31	(A)
Q.No. 32	(C)
Q.No. 33	(C)
Q.No. 34	(C)
Q.No. 35	(A)

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Q.No. 36	(D)
Q.No. 37	(C)
Q.No. 38	(D)
Q.No. 39	(C)
Q.No. 40	(C)
Q.No. 41	(B)
Q.No. 42	(B)
Q.No. 43	(D)
Q.No. 44	(B)
Q.No. 45	(D)
Q.No. 46	(A)
Q.No. 47	(C)
Q.No. 48	(C)
Q.No. 49	(C)
Q.No. 50	(A)
Q.No. 51	(D)
Q.No. 52	(B)
Q.No. 53	(A)
Q.No. 54	(C)
Q.No. 55	(C)
Q.No. 56	(C)
Q.No. 57	(C)
Q.No. 58	(C)
Q.No. 59	(D)
Q.No. 60	(C)
Q.No. 61	(A)
Q.No. 62	(A)
Q.No. 63	(B)
Q.No. 64	(D)
Q.No. 65	(B)
Q.No. 66	(B)
Q.No. 67	(D)
Q.No. 68	(B)
Q.No. 69	(A)
Q.No. 70	(C)
Q.No. 71	(D)
Q.No. 72	(D)
Q.No. 73	(D)
Q.No. 74	(D)
Q.No. 75	(C)
Q.No. 76	(C)
Q.No. 77	(B)
Q.No. 78	(D)
Q.No. 79	(D)
Q.No. 80	(D)

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Q.No. 81	(C)
Q.No. 82	(D)
Q.No. 83	(C)
Q.No. 84	(A)
Q.No. 85	(A)
Q.No. 86	(D)
Q.No. 87	(B)
Q.No. 88	(A)
Q.No. 89	(D)
Q.No. 90	(C)
Q.No. 91	(B)
Q.No. 92	(C)
Q.No. 93	(B)
Q.No. 94	(C)
Q.No. 95	(D)
Q.No. 96	(D)
Q.No. 97	(B)
Q.No. 98	(D)
Q.No. 99	(B)
Q.No. 100	(C)
Q.No. 101	(D)
Q.No. 102	(A)
Q.No. 103	(A)
Q.No. 104	(D)
Q.No. 105	(C)
Q.No. 106	(C)
Q.No. 107	(B)
Q.No. 108	(C)
Q.No. 109	(C)
Q.No. 110	(C)
Q.No. 111	(A)
Q.No. 112	(B)
Q.No. 113	(C)
Q.No. 114	(C)
Q.No. 115	(C)
Q.No. 116	(D)
Q.No. 117	(B)
Q.No. 118	(A)
Q.No. 119	(C)
Q.No. 120	(C)
Q.No. 121	(A)
Q.No. 122	(B)
Q.No. 123	(D)
Q.No. 124	(C)
Q.No. 125	(D)

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Q.No. 126	(A)
Q.No. 127	(C)
Q.No. 128	(B)
Q.No. 129	(A)
Q.No. 130	(A)
Q.No. 131	(B)
Q.No. 132	(B)
Q.No. 133	(D)
Q.No. 134	(C)
Q.No. 135	(C)
Q.No. 136	(B)
Q.No. 137	(D)
Q.No. 138	(D)
Q.No. 139	(D)
Q.No. 140	(A)
Q.No. 141	(B)
Q.No. 142	(B)
Q.No. 143	(B)
Q.No. 144	(B)
Q.No. 145	(C)
Q.No. 146	(D)
Q.No. 147	(B)
Q.No. 148	(C)
Q.No. 149	(C)
Q.No. 150	(D)
Q.No. 151	(C)
Q.No. 152	(C)
Q.No. 153	(C)
Q.No. 154	(B)
Q.No. 155	(D)
Q.No. 156	(C)
Q.No. 157	(D)
Q.No. 158	(B)
Q.No. 159	(D)
Q.No. 160	(A)

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