Sample Paper

Full Test (English)

Q.No. 1 Which of the following is an amphoteric hydroxide ?

(A) $Sr(OH)_2$

(B) $Ca(OH)_2$

(C) $MgOH_2$

(D) $Be(OH)_2$

Q.No. 2 When a block of mass M is suspended by a long wire of length L, the length of the wire becomes (L+l). The elastic potential energy stored in the extended wire is:

(A) Mgl

(B) MgL

(C) 1/2 Mgl

(D) 1/2 MgL

Q.No. 3 Western Ghats have a large number of plant and animal species that are not found anywhere else. Which of the following terms will you use to notify such species?

(A) Threatened

(B) Keystone

(C) Endemic

(D) Vulnerable

**Q.No. 4** For a p-type semiconductor, which of the following statements is true ?

(A) Electrons are the majority carriers and trivalent atoms are the dopants.

(B) Holesare the majority carriers and trivalent atoms are the dopants.

(C) Holes are the majority carriers and pentavalent atoms are the dopants.

(D) Electrons are the majority carriers and pentavalent atoms are the dopants.

Q.No. 5 The work done to raise a mass m from the surface of the earth to a height h, which is equal to the radius of the earth, is:

(A) mgR

(B) 2 mgR

(C) ½ mgR

(D) 3/2 mgR

Q.No. 6 In a u-tube as shown in the fig. water and oil are in the len side and right side of the tube respectively. The heights from the bottom for water and oil columns are 15 cm and 20 cm respectively. The
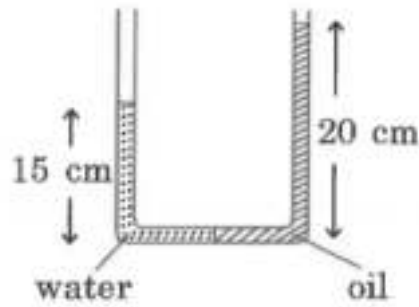
density of the oil is [take-ρ^{water} = 1000 kg/m^3

(A) 1000 kg/m^3

(B) 1333 kg/m^3

(C) 1200 kg/m^3

(D) 750 kg/m^3

Q.No. 7 A body weighs 200 N on the surface of the earth. How much will it weigh half way down to the centre of the earth?

(A) 150 N

(B) 200 N

(C) 250 N

(D) 100 N

Q.No. 8 How does steroid hormone influence the cellular activities ?

(A) Changing the permeability of:the cell membrane.

(B) Binding to DNA and forming a gene-hormone complex.

(C) Activating cyclic AMP located on the cell membrane.

(D) Using aquaporin channels as second messenger.

Q.No. 9 The concept of "Omnis cellula-e cellula" regarding cell division was first proposed by :

(A) Rudolf Virchow

(B) Theodore Schwann

(C) Schleiden

(D) Aristotle

Q.No. 10 Which of the following is paramagnetic ?

(A) Li^2

(B) O^2

(C) N^2

(D) H^2

Q.No. 11 Which of the following pairs of gases is mainly responsible for green house effect ?

(A) Ozone and Ammonia

(B) Oxygen and Nitrogen

(C) Nitrogen and Sulphur dioxide

(D) Carbon dioxide and Methane

Q.No. 12 An object flying in air with velocity $(20\,\hat{i} + 25\,\hat{j} - 12\hat{k})$ suddenly breaks into two pieces whose masses are in the ratio 1:5. The smaller mass flies off with a velocity $(100\hat{i} + 35\,\hat{j} + 8\hat{k})$. The velocity of the piece will be, Larger piece will be,

(A) $20\hat{i} + 15\,\hat{j} + 80\hat{k}$

(B) $20\hat{i} - 15\,\hat{j} - 80\hat{k}$

(C) $4\hat{i} + 23\,\hat{j} - 16\hat{k}$

(D) $-100\hat{i} - 35\,\hat{j} - 8\hat{k}$

Q.No. 13 When an object is shot from the bottom of a long smooth inclined plane kept at an angle 60° with horizontal, it can travel a distance x_1, along the plane. But when the inclination is decreased to 30° and the same object is shot with the same velocity, it can travel x_2, distance. Then $x_1 : x_2$ will be:

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

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

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

(D) $1 : 2\sqrt{3}$

Q.No. 14 Consider following features : [a] Organ system level of organisation [b] Bilateral symmetry [c] True coelomates with segmentation of body Select the correct option of animal groups which possess all the above characteristics.

(A) Annelida, Arthropoda and Chordata

(B) Annelida, Arthropoda and Mcllusca

(C) Arthropoda, Mollusca and Chordata

(D) Annelida, Mollusca and Chordata

	Catalyst		Process
(i)	V_2O_5	(a)	The oxidation of ethyne to ethanal
(ii)	$TiCl_4$ + $Al(CH_3)_3$	(b)	Polymerisation of alkynes
(iii)	$PdCl_2$	(c)	Oxidation of SO_2 in the manufacture of H_2SO_4
(iv)	Nickel complexes	(d)	Polymerisation of ethylene

Q.No. 15 Match the catalyst with the process

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

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

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

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

Q.No. 16 Which one of the following is not a method of in situ conservation of biodiversity ?

(A) Biosphere Reserve

(B) Wildlife Sanctuary

(C) Botanical Garden

(D) Sacred Grove

Q.No. 17 Which of the following statements about methanogens is not correct?

(A) They grow aerobically and breakdown cellulose-rich food

(B) They produce methane gas.

(C) These can be used to produce biogas.

(D) They are found in the rumen Of cattle and their excreta

Q.No. 18 Which of the following hormones is responsible for both the milk ejection reflex and the foetal ejection reflex ?

(A) Oxytocin

(B) Relaxin

(C) E.Arogen

(D) Prolactin

Q.No. 19 The Crystal Field Stabilisation Energy (CFSE) For $[CoCl_6]^{4-}$ is 18000 cm^{-1} . The CFSE for $[CoCl_4]^{2-}$ will be

(A) 1800 cm^{-1}

(B) 8000 cm^{-1}

(C) 6000 cm^{-1}

(D) 16000 cm^{-1}

Q.No. 20 If an agricultural field is liberally irrigated for a prolonged period Of time, it is likely to face a problem of :

(A) Acidity

(B) Salinity

(C) Metal toxicity

(D) Alkalinity

Q.No. 21 In Antirrhinum (Snapdragon), a red flower was crossed with a white flower and in F_1 generation, pink flowers were obtained. When pink flowers were selfed, the F_2 generation showed white, red and pink flowers. Choose the incorrect statement from the following :

(A) This experiment does not follow the Principle of Dominance.

(B) Pink colour in F_1 is due to incomplete dominance.

(C) Ratio of F_2, is 1/4 (Red) : 2/4(Pink) : 1/4 (White)

(D) Law of Segregation does not apply in this experiment.

Q.No. 22 A circuit when connected to an AC source of 12 V gives a current of 0.2 A. The same circuit when connected to a DC source of 12 V, gives a current of 0.4 A. The circuit is

(A) series LC

(B) series LCR

(C) series LR

(D) series RC

Q.No. 23 In which genetic condition, each cell in the affected person, has three sex chromosomes XXY ?

(A) Phenylketonuria

(B) Turner's Syndrome

(C) Thalassemia

(D) Kleinfelter's Syndrome

Q.No. 24 Match the Xenon compounds in Column -I with its structure in Column - II and assign the correct

	Column - I		Column - II
(a)	XeF$_4$	(i)	pyramidal
(b)	XeF$_6$	(ii)	square planar
(c)	XeOF$_4$	(iii)	distorted octahedral
(d)	XeO$_3$	(iv)	square pyramidal

code :

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

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

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

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

Q.No. 25 From evolutionary point of view, retention of the female gametophyte with developing young embryo on the parent sporophyte for some time, is first observed in :

(A) Liverworts

(B) Mosses

(C) Pteridophytes

(D) Gymnosperms

Q.No. 26 The volume occupied by 1.8g of water vapour at 374°C and 1 bar pressure will be - [Use R = 0.083 bar LK^{-1} mol^{-1}]

(A) 3.10 L

(B) 5.37 L

(C) 96.66 L

(D) 55.87 L

Q.No. 27 The reaction that does not give benzoic acid as the major product is -

(A)

(B)

(C)

(D)
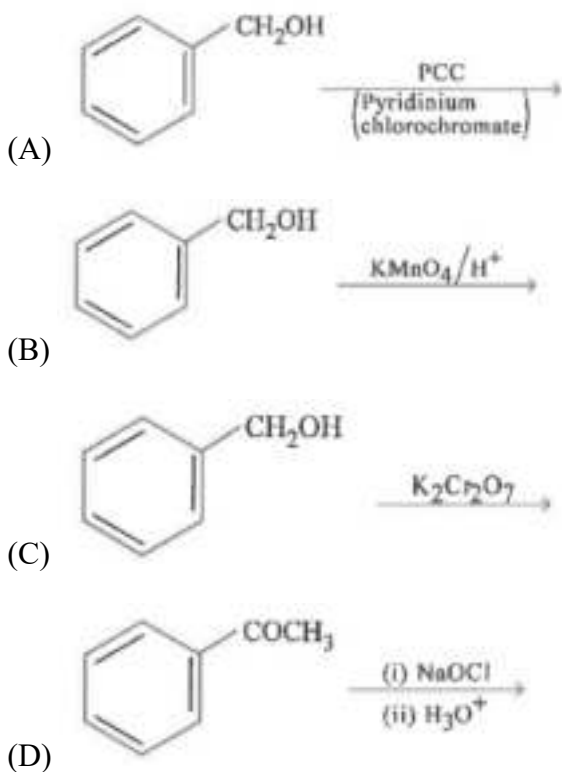
Q.No. 28 The correct option representing a Freundlich adsorption isotherm is -

(A) $\frac{x}{m} = kp^{-0.5}$

(B) $\frac{x}{m} = kp^{-1}$

(C) $\frac{x}{m} = kp^{-0.3}$

(D) $\frac{x}{m} = kp^{2.5}$

Q.No. 29 Kwashiorkor disease is due to -

(A) deficiency of carbohydrates

(B) protein deficiency not accompanied by calorie deficiency

(C) simultaneous deficiency of proteins and fats

(D) simultaneous deficiency of proteins and calories

Q.No. 30 The frequency of recombination between gene pairs on the same chromosome as a measure of the distance between genes was explained by :

(A) T.H. Morgan

(B) Gregor J. Mendel

(C) Alfred Sturtevant

(D) Sutton Boveri

Q.No. 31 Two similar thin equi-convex lenses, of focal length f each, are kept coaxially in contact with each other such that the focal length of the combination is F,. When the space between the two lenses is filled with glycerin (which has the same refractive index (w= 1.5) as that of glass) then the equivalent focal length is F_2. The ratio $F_1 : F_2$ will be :

(A) 2:1

(B) 1:2

(C) 2:3

(D) 3:4

Q.No. 32 The oxidation state of Cr in CrO_6

(A) +6

(B) +4

(C) -6

(D) +12

Q.No. 33 Which of the following conditions will stimulate parathyroid gland to release parathyroid hormone ?

(A) Fall in bone Ca levels

(B) Rise in blood levels

(C) Fall in active Vitamin D levels

(D) Fall in blood Ca+2 levels

Q.No. 34 Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL?

(A) 1500mL

(B) 1700mL

(C) 2200mL

(D) 2700mL

Q.No. 35 Exploration of molecular, genetic and species level diversity for novel products of economic importance is known as :

(A) Bioremediation

(B) Bioprospecting

(C) Biopiracy

(D) Bioenergetics

Q.No. 36 Select the incorrect statement regarding inbreeding.

(A) Inbreeding increases homozygosity.

(B) Inbreeding selects harmful recessive genes that reduce fertility and productivity.

(C) Inbreeding is essential to evolve pure lines in any animal

(D) Inbreeding helps in accumulation of superior genes and elimination of undesirable genes.

Q.No. 37 Which of the following is incorrect statement ?

(A) PbF_4 is covalent in nature

(B) $SiCl_4$ is easily hydrolysed

(C) GeX_4 (X = F, Cl, Br, I is more stable than GeX_2

(D) SnF_4 is ionic in nature

Q.No. 38 Use of an artificial kidney during hemodialysis' may result in: [a] Nitrogenous waste build-up in the body [b] Non-elimination of excess potassium ions [c] Reduced absorption of calcium ions from gastro-intestinal tract [d] Reduced RBC production Which of the following options is the most appropriate ?

(A) [a] and [b] are correct

(B) [b] and [c] are correct

(C) [c] and [d] are correct

(D) [a] and [d] are correct

Q.No. 39 Select the correct statement

(A) Inspiration occurs when atmospheric pressure is less than intrapulmonary pressure.

(B) Expiration is initiated due to contraction of diaphragm.

(C) Expiration occurs due to external

(D) Intrapulmonary pressure is lower than the atmospheric pressure during inspiration.

Q.No. 40 Conversion of glucose to glucose-6-phosphate, the first irreversible reaction of glycolysis, is catalyzed by :

(A) Aldolase

(B) Hexokinase

(C) Enolase

(D) Phosphofructokinase

Q.No. 41 Under isothermal condition, a gas at 300 K expands from 0.1 L to 0.25 L against a constant external pressure of 2 bar. The work done by the gas is: . [Given that 1 Lbar = 100 J]

(A) -30 J

(B) 5 kJ

(C) 25 J

(D) 30 J

Q.No. 42 Two metal spheres, one of radius R and the other of radius 2R respectively have the same surface charge density σ. They are brought in contact and separated. What will be the new surface charge densities on them ?
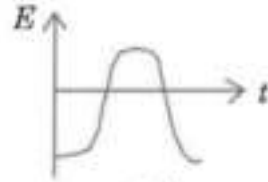
(A) $\sigma_1 = \frac{5}{2}\sigma, \quad \sigma_2 = \frac{5}{3}\sigma$

(B) $\sigma_1 = \frac{5}{3}\sigma, \quad \sigma_2 = \frac{5}{6}\sigma$
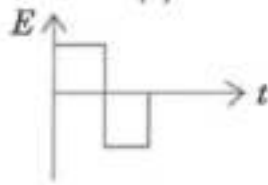
(C) $\sigma_1 = \frac{5}{6}\sigma, \quad \sigma_2 = \frac{5}{2}\sigma$

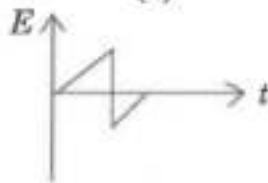(D) $\sigma_1 = \frac{5}{2}\sigma, \quad \sigma_2 = \frac{5}{6}\sigma$

Q.No. 43 The variation of EMF with time for four types of generators are shown in the figures. Which
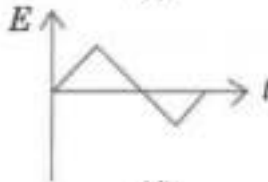

(a)

(b)

(c)

(d)

amongst them can be called AC ?

(A) [a] and [b]

(B) only [a]

(C) [a] and [d]

(D) [a], [b], [c], [d]

Q.No. 44 Bicarpellary Ovary with Obliquely placed septum is seen in :

(A) Solanum

(B) Sesbania

(C) Brassica

(D) Aloe

Q.No. 45 Which of the following statements is correct ?

(A) Fungal component of lichens is called phycobiont.

(B) Lichens are not good pollution indicators.

(C) Lichens do not grow in polluted areas.

(D) Algal of lichens is called mycobiant.

Q.No. 46 A solid cylinder of mass 2 kg and radius 50 cm rolls up an inclined plane of angle of inclination 30°. The centre of mass of the cylinder has speed of 4 m/s. The distance travelled by the cylinder on the inclined surface will be. [take g = 10 m/s^2]

(A) 1.2 m

(B) 2.4 m

(C) 2.2 m

(D) 1.6 m

Q.No. 47 All the components of the nodal tissue are autoexcitable. Why does the SA node act as the normal pacemaker ?

(A) Only SA nodes can convey the action potential to the other components.

(B) SA node has the highest rate of depolarisation.

(C) SA node has the lowest rate of depolarisation.

(D) SA node is the only component to the threshold.

Q.No. 48 The ciliated epithelial cells are required to move particles or mucus in a specific direction. In humans, these cells are mainly present in:

(A) Bile duct and Bronchioles

(B) Fallopian tubes and Pancreatic duct

(C) Eustachian tube and Salivary duct

(D) Bronchioles and Fallopian tubes

Q.No. 49 Thiobacillus is a group of bacteria helpful in carrying out :

(A) Nitrogen fixation

(B) Chemoautotrophic fixation

(C) Nitrification

(D) Denitrification

Q.No. 50 Artificial light, extended work-time and reduced sleep-time disrupt the activity of -

(A) Adrenal gland

(B) Posterior pituitary gland

(C) Thymus gland

(D) Pineal gland

	Column I		Column II
(a)	Golgi apparatus	(i)	Synthesis of protein
(b)	Lysosomes	(ii)	Trap waste and excretory products
(c)	Vacuoles	(iii)	Formation of glycoproteins and glycolipids
(d)	Ribosomes	(iv)	Digesting biomolecules

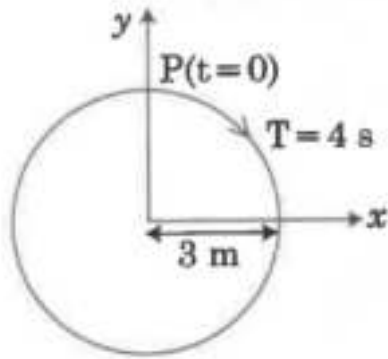**Q.No. 51** Match the column I with column II. Select the correct option from the following:

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

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

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

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

Q.No. 52 The radius of circle, the period of revolution, initial position and sense of revolution are indicated

in the fig.   y- projection of the radius vector of rotating particle P is:

(A) $y(t) = -3 \cos 2\pi t$, where y in m

(B) $y(t) = 4 \sin (\pi t/2)$, where y in m

(C) $y(t) = 3 \cos (3\pi t/2)$, where y in m

(D) $y(t) = 3 \cos (\pi t/2)$, where y in m

Q.No. 53 Match the following genera with their respective phylum:

(a)	Ophiura	(i)	Mollusca
(b)	Physalia	(ii)	Platyhelminthes
(c)	Pinctada	(iii)	Echinodermata
(d)	Planaria	(iv)	Coelenterata

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

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

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

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

Q.No. 54 Which of the following statements is not correct ?

(A) Rods are very sensitive and contribute to daylight vision.

(B) In the knee-jerk reflex, stimulus is the stretching of muscle and response is its contraction.

(C) An action potential in an axon does not move backward because the segment behind is in a refractory phase.

(D) Depolarisation of hair cells of cochlea results in the opening of the mechanically gated potassium-ion channels.

Q.No. 55 α-particle consists of :

(A) 2 protons and 2 neutrons only

(B) 2 electrons, 2 protons and 2 neutrons

(C) 2 electrons and 4 protons only

(D) 2 protons only

Q.No. 56 Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid.

(A) Plasmodium vivax / UTI test

(B) Streptococcus pneumoniae / Widal test

(C) Salmonella typhi / Anthrone test

(D) Salmonella typhi / Widal test

Q.No. 57 In the dicot root the vascular cambium originates from :

(A) Parenchyma between endodermis and pericycle

(B) Interfascicular and interfascicular tissue in a ring

(C) Tissue located below the phloem bundles and a portion of pericycle tissue above protoxylem

(D) Cortical region

Q.No. 58 In which of the following devices, the eddy current effect is not used ?

(A) induction furnace

(B) magnetic braking in train

(C) electromagnet

(D) electric heater

Q.No. 59 A mass falls from a height 'h' and its time of fall 't ' is recorded in terms of time period T of a simple pendulum. On the surface of earth it is found that t = 2T. The entire set up is taken on the surface of another planet whose mass is half of that of earth and radius the same. Same experiment is repeated and corresponding times noted as t and T Then we can say

(A) t' < 2T'

(B) t' = 2T'

(C) t' = √2T

(D) t' > 2T'

Q.No. 60 The non-essential amino acid among the following is

(A) valine

(B) leucine

(C) alanine

(D) lysine

Q.No. 61 The number of sigma (σ) and pi (π) bonds in pent-2-en-4-yne is:

(A) 10 σ bonds and 3π bonds

(B) 8 σ bonds and 5π bonds

(C) 11 σ bonds and 2π bonds

(D) 13 σ bonds and 13π bonds

Q.No. 62 Which of the following pair of organelles does not contain DNA ?

(A) Mitochondria and Lysosomes

(B) Chloroplast and Vacuoles

(C) Lysosomes and Vacuoles

(D) Nuclear envelope and Mitochondria

Q.No. 63 Which of the following is not a feature of active transport of solutes in plants ?

(A) Occurs through membranes

(B) Requires ATP

(C) Occurs against concentration gradient

(D) Non-selective

Q.No. 64 Which of the following diseases is an auto-immune disorder ?

(A) Osteoporosis

(B) Gout

(C) Systematic lupus erythematosus

(D) Arthritis

Q.No. 65 Match the following structures with their respective location in organs:

(a)	Crypts of Lieberkühn	(i)	Pancreas
(b)	Glisson's Capsule	(ii)	Duodenum
(c)	Islets of Langerhans	(iii)	Small intestine
(d)	Brunner's Glands	(iv)	Liver

Select the correct option from the following :

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

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

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

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

Q.No. 66 An object kept in a large room having an air temperature of 25°C takes 12 minutes to cool from 80°C to 70°C. The time taken to cool for the same object from 70°C to 60°C would be nearly,

(A) 20 min

(B) 15 min

(C) 10 min

(D) 12 min

Q.No. 67 Match the hominids with their correct brain size:

(a)	*Homo habilis*	(i)	900 cc
(b)	*Homo neanderthalensis*	(ii)	1350 cc
(c)	*Homo erectus*	(iii)	650 - 800 cc
(d)	*Homo sapiens*	(iv)	1400 cc

Select the correct option.

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

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

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

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

Q.No. 68 Assuming that the gravitational potential energy of an object at infinity is zero, the change in potential energy (final — initial) of an object of mass m , when taken to a height h from the surface of earth (of radius R is given by,

(A) mgh

(B) $\frac{GMmh}{R(R+h)}$

(C) $-\frac{GMm}{R+h}$

(D) $\frac{G M m}{R+h}$

Q.No. 69 A cycle wheel of radius 0.5 m is rotated with constant angular velocity of 10 rad/s in a region of magnetic field of 0.1 T which is perpendicular to the plane Of the wheel. The EMF generated between its centre and the nm is,

(A) 0.5 V

(B) zero

(C) 0.25 V

(D) 0.125 V

Q.No. 70 A compound 'X' upon reaction with H_2O produces a colorless gas 'Y' with rotten fish smell. Gas 'Y' is absorbed in a solution of $CuSO_4$ to give Cu_3P_2 as one of the products . Predict the compound 'X'.

(A) As_2O_3

(B) $Ca_3(PO_4)_2$

(C) Ca_3P_2

(D) NH_4Cl

Q.No. 71 Two identical capacitors C_1 and C_2 of equal capacitance are connected as shown in the circuit. Terminals a and b of the key k are connected to charge capacitor C_1 using a battery of emf V volt. Now disconnecting a and b the terminals b and c are connected. Due to this, what will be the percentage loss of
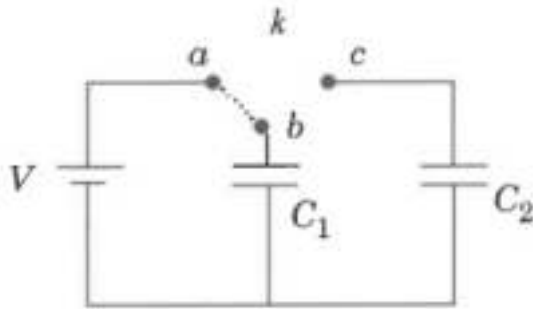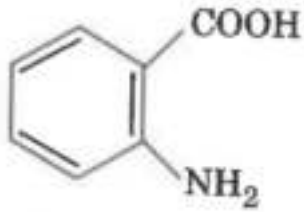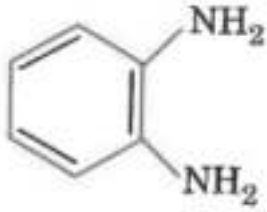

energy ?

(A) 50 %

(B) 25 %

(C) 75 %

(D) 0 %

Q.No. 72 The major product of the following reaction is:


(A)

(B)
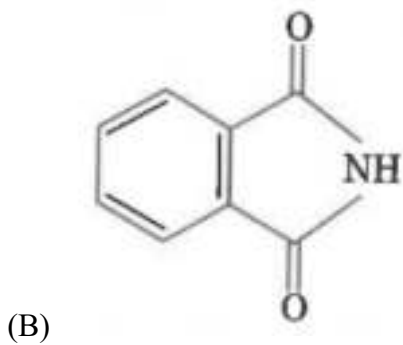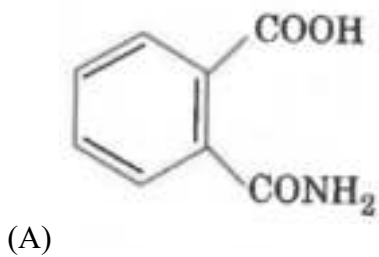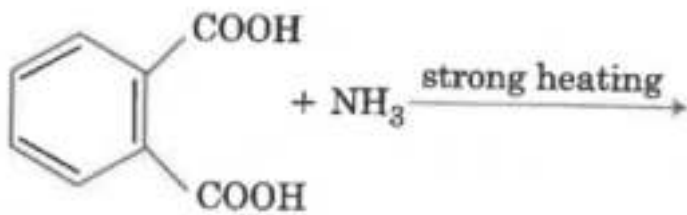
(C)

(D)

Q.No. 73 Which is the most common type of embryo sac in angiosperms ?

(A) Monosporic with two sequential mitotic divisions

(B) Bisporic with two sequential mitotic divisions

(C) Tetrasporic with one mitotic stage of divisions

(D) Monosporic with three sequential mitotic divisions

Q.No. 74 Six similar bulbs are connected as shown in the figure with a DC source of emf E, and zero internal resistance. The ratio of power consumption by the bulbs when (i) all are glowing and (ii) in the
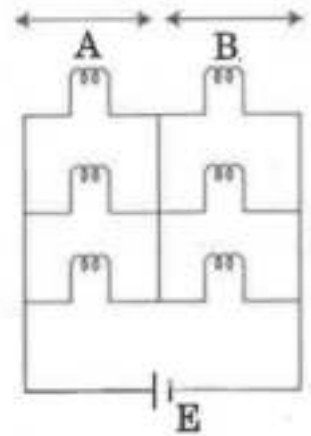
situation when two from section A and one from section. B are glowing, will be:

(A) 4:9

(B) 9:4

(C) 1:2

(D) 2:1

Q.No. 75 From the following, identify the correct combination of salient features of Genetic Code-

(A) Universal,Ambiguous,Degenerate

(B) Degenerate, Non-overlapping. Non-ambiguous

(C) Universal,Non-ambiguous,Overlapping

(D) Degenerate, Overlapping, Commaless

Q.No. 76 Which of the following statements about ozone is correct ?

(A) Tropospheric ozone is good

(B) Stratospheric ozone protects us from UV radiations

(C) Tropospheric ozone protects us from UV radiations

(D) Stratospheric ozone is bad

Q.No. 77 Which mixture of the solutions will lead to the formation of negatively charged colloidal sol ?

(A) 50 mL of 1 M $AgNO_3$ + 50 mb of 1.5M KI

(B) 50 mL of 1 M $AgNO_3$ + 50 mL of 2M KI

(C) 50mL of 2 M $AgNO_3$ + 50 mL of 1.5 M KI

(D) 50mL of 0.1 M AgNO3 + 50 mL of 0.1 M KI

Q.No. 78 Under which of the following conditions will there be no change in the reading frame of following mRNA? 5' AACAGCGGUGCUAUU 3'
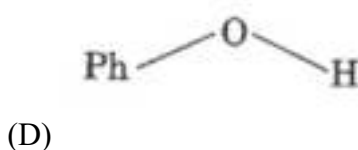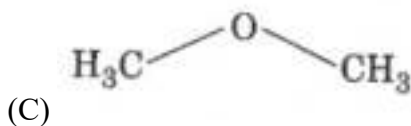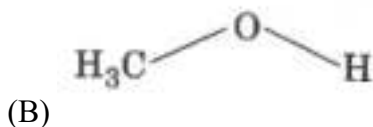
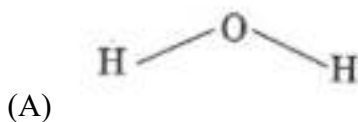(A) Insertion of G at 5th position

(B) Deletion of G from 5th position:

(C) Insertion of AandG at 4th and 5th positions respectively

(D) Deletion of GGU from 7th, 8th and 8th positions

Q.No. 79 The compound that is most difficult to protonate is:

(A)

(B)

(C)

(D)

Q.No. 80 Which of the following is against the rules of ICBN ?

(A) Scientific names are in latin and should be italized.

(B) Generic and specific names should be written starting with small letters.

(C) Handwritten scientific names should be underlined

(D) Every species should have a generic name and a specific epithet.

Q.No. 81 Which of the following series of transitions in the spectrum of hydrogen atom falls in visible region ?

(A) Lyman series

(B) Balmer series

(C) Paschen series .

(D) Brackétt series -

Q.No. 82 Select the incorrect statement.

(A) Inbreeding increases homozygosity.

(B) Inbreeding is essential to evolve purelines in any animal.

(C) Inbreeding selects harmful recessive genes that reduce fertility and productivity.

(D) Inbreeding helps in accumulation of superior genes and elimination of undesirable genes.

Q.No. 83 Select the correct sequence of organs in the alimentary canal of cockroach starting from mouth :

(A) Pharynx → Oesophagus —> Crop → Gizzard ---> Ileum ---> Colon ---> Rectum

(B) Pharynx —> Oesophagus —> Gizzard --->Crop ---> Ileum —> Colon ---> Rectum

(C) Pharynx ---> Oesophagus ---> Gizzard ---> Tleum —> Crop ----> Colon —> Rectum

(D) Pharynx —> Oesophagus -----> Ileum ----> Crop -----> Gizzard —> Colon —> Rectum

Q.No. 84 The circuit diagram shown here corresponds to the logic gate,
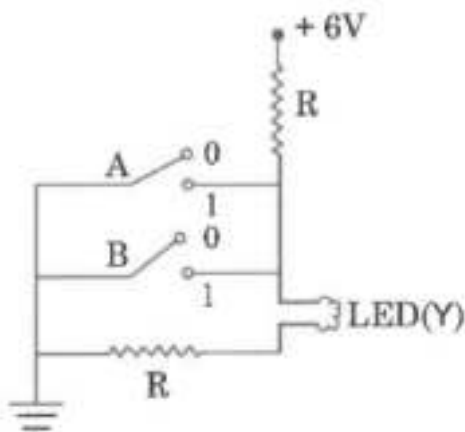
(A) OR

(B) NAND

(C) NOR

(D) AND

Q.No. 85 Ecosystem diversity refers to ……

(A) Ecological complexity

(B) Genetic existing

(C) Number of species increases

(D) Variability in living organism

Q.No. 86 Grass leaves curl inwards during very dry weather. Select the most appropriate reason from the following :

(A) Closure of stomata

(B) Flaccidity of bulliform cells

(C) Shrinkage of air spaces in spongy mesophyll

(D) Tyloses in vessels

Q.No. 87 Which of the statements given below is not true about formation of Annual Rings in trees ?

(A) Annualringis a combination of spring wood and autumn wood produced in a year.

(B) Differential activity of cambium causes light and dark bands of tissue - early and late wood respectively.

(C) Activity of cambium depends upon variation in climate.

(D) Annual rings are not prominent in trees of temperate region.

Q.No. 88 A parallel plate capacitor of capacitance 20 µF is being charged by a voltage source whose potential is changing at the rate of 3 V/s. The conduction current through the connecting wires, and the displacement current through the plates of the capacitor, would be, respectively :

(A) zero, 60 µA

(B) 60 µA, 60 µA

(C) 60 µA, zero

(D) zero, zero

Q.No. 89 Match the following RNA polymerases with their transcribed products :

(a) RNA polymerase I   (i) tRNA
(b) RNA polymerase II   (ii) rRNA
(c) RNA polymerase III   (iii) hnRNA   Select the correct option from the following:

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

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

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

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

Q.No. 90 Which of the following receptors are specifically responsible for maintenance of balance of body and posture?

(A) Tectorial membrane and macula

(B) Crista ampullaris and macula

(C) Basilar membrane and otoliths

(D) Hair cells and organ of corti

Q.No. 91 Which of the following contraceptive methods do involve a role of hormone ?

(A) Lactational amenorrhea, Pills, Emergency contraceptives

(B) Barrier method, Lactational amenorrhea, Pills

(C) CuT, Pills, Emergency contraceptives .

(D) 'Pills, Emergency contraceptives, Barrier methods

Q.No. 92 A selectable marker is used to :

(A) select a suitable vector for transformation in a specific crop

(B) mark a gene on a chromosome for isolation using restriction enzyme

(C) help in eliminating the non-transformants. so that the transformants can be regenerated

(D) identity the gene for a desired trait in an alien organism

Q.No. 93 Which of the following immune responses is 'responsible for rejection of kidney graft ?
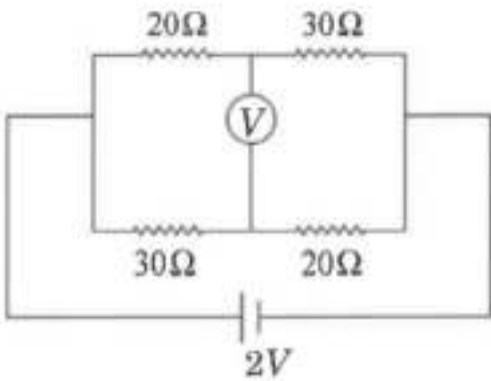
(A) Auto-immune response

(B) Humoral Immune response

(C) Inflammatory immune response

(D) Cell-mediated immune response

Q.No. 94 The reading of an ideal voltmeter in the circuit shown is.

(A) 0.5 V

(B) 0.4 V

(C) 0.6 V

(D) 0 V

Q.No. 95 In which case change in entropy is negative ?

(A) Evaporation of water

(B) Expansion of a gas at constant temperature

(C) Sublimation of solid to gas

(D) $2H(g) \rightarrow HC_2(g)$

Q.No. 96 A small hole of area of cross-section 2 mm^2 is present near the bottom of a fully filled open tank of height 2m. Taking g= 10 m/s^2, the rate of flow of water through the open hole would be nearly :

(A) 12.6 x 10^{-6} m^3/s

(B) 8.9 x 10^{-6} m^3/s

(C) 2.23 x 10^{-6} m^3/s

(D) 6.4 x 10^{-6} m^3/s

Q.No. 97 Which of the following is true for Golden rice ?

(A) It is Vitamin A enriched, with a gene from daffodil.

(B) Itis pest resistant, with a gene from Bacillus thuringiensis.

(C) It is drought tolerant, developed using Agrobacterium vector.

(D) It has yellow grains, because of a gene introduced from a primitive variety of rice.

Q.No. 98 Which of the following statements is incorrect ?

(A) Viroids lack a protein coat

(B) Viruses are obligate parasites

(C) Infective constituent in viruses is the protein coat

(D) Prions consist of abnormally folded proteins

Q.No. 99 Match column I with column II

Column - I		Column - II
(a)	Saprophyte	(i)	Symbiotic association of fungi with plant roots
(b)	Parasite	(ii)	Decomposition of dead organic materials
(c)	Lichens	(iii)	Living on living plants or animals
(d)	Mycorrhiza	(iv)	Symbiotic association of algae and fungi

Choose the correct answer from the options given below :

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

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

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

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

Q.No. 100 A truck is stationary and has a bob suspended by a light string, in a frame attached to the truck. The truck suddenly moves to the right with an acceleration of a . The pendulum will tilt

(A) to the left and angle of inclination of the pendulum with the vertical is $\sin^{-1}\left(\frac{a}{g}\right)$

(B) to the left and angle of inclination of the pendulum with the vertical is $\tan^{-1}\left(\frac{g}{a}\right)$

(C) to the left and angle of inclination of the pendulum with the vertical is $\sin^{-1}\left(\frac{g}{a}\right)$

(D) to the left and angle of inclination of the pendulum with the vertical is $\sin^{-1}\left(\frac{a}{g}\right)$

Q.No. 101 Match the Column -I with Column -II:

	Column - I		Column - II
(a)	P - wave	(i)	Depolarisation of ventricles
(b)	QRS complex	(ii)	Repolarisation of ventricles
(c)	T - wave	(iii)	Coronary ischemia
(d)	Reduction in the size of T - wave	(iv)	Depolarisation of atria
		(v)	Repolarisation of atria

Select the correct option.

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

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

(C) a-ii b-i c-v d-iii

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

Q.No. 102 What would be the heart rate of a person if the cardiac output is 5 L, blood volume in the ventricles at the end of diastole is 100 mL and at the end of ventricular systole is 50 mL?

(A) 50 beats per minute

(B) 75 beats per minute

(C) 100 beats per minute

(D) 125 beats per minute

Q.No. 103 The maximum volume of air a person can breathe in after a forced expiration is known as :

(A) Inspiratory Capacity

(B) Total Lung Capacity

(C) Expiratory Capacity

(D) Vital Capacity

Q.No. 104 The production of gametes by the parents, the formation of zygotes, the F1 and F2 plants, can be understood using :

(A) Punnet square

(B) Wenn diagram

(C) Pie diagram

(D) A pyramid diagram

Q.No. 105 Which of the following species is not stable ?

(A) $[SiF_6]^{2-}$

(B) $[GeCl_6]^{2-}$

(C) $[Sn(OH)_6]^{2-}$

(D) $[SiCl_6]^{2-}$

Q.No. 106 Which of the following is the most important cause for animals and plants being driven to extinction ?

(A) Habitat loss and fragmentation

(B) Drought and floods

(C) Economic exploitation

(D) Alien species invasion

Q.No. 107 Crossing over takes place between which chromatids and in which stage of the cell cycle?

(A) Non-sister chromatids of homologous chromosomes at Zygotene stage of prophase I.

(B) Non-sister chromatids of non-homologous chromosomes at Pachytene stage of prophase I

(C) Non-sister chromatids of non-homologous chromosomes at Zygotene stage of prophase I.

(D) Non-sister chromatids of homologous chromosomes at Pachytene stage of prophase I

Q.No. 108 Prosthetic groups differ from co-enzymes in that -

(A) their association with apoenzymes is transient.

(B) they can serve as co-factors in a number of enzyme - catalyzed reactions.

(C) they require metal ions for their activity.

(D) they (prosthetic groups) are tightly bound to apoenzymes.

Q.No. 109 The time period of a geostationary satellite is 24 h, at a height $6R_E$ is radius of earth) from the surface of earth. The time period of another satellite whose height is 2.5 R_E from surface will be.

(A) $\frac{24}{2.5}$h

(B) $\frac{12}{2.5}$h

(C) 6 √2 h

(D) 12 √2 h

Q.No. 110 Two parallel infinite line charges with linear charge densities $+\lambda C/m$ and $-\lambda C/m$ are placed at a distance of 2R in free space. What is the electric field mid - way between the two line charges ?

(A) zero

(B) $\frac{2\lambda}{\pi\epsilon_0 R} N/C$

(C) $\frac{\lambda}{\pi\epsilon_0 R} N/C$

(D) $\frac{\lambda}{2\pi\epsilon_0 R} N/C$

Q.No. 111 The method used to remove temporary hardness of water is:

(A) Calgon's method

(B) Clark's method

(C) Ion-exchange method

(D) Synthetic resins method

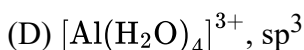**Q.No. 112** A hollow metal sphere-of radius R is uniformly charged. The electric field due to the sphere at a distance r from the centre
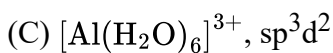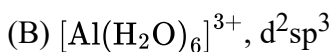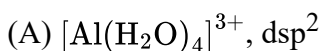
(A) increases as r increases for r < R and for r > R

(B) zero as r increases for r < R, 'decreases as r increases for r > R

(C) zero as r increases for r' < R, increases as r increases for r > R

(D) decreases as r increases for r < R and for r > R

Q.No. 113 Aluminium chloride in acidified aqueous solution a complex 'A' in Which hybridisation state of A1 is B '. What are 'A' and 'B' respectively ?

(A) $[Al(H_2O)_4]^{3+}$, dsp^2

(B) $[Al(H_2O)_6]^{3+}$, d^2sp^3

(C) $[Al(H_2O)_6]^{3+}$, sp^3d^2

(D) $[Al(H_2O)_4]^{3+}$, sp^3

Q.No. 114 pH of a saturated solution of $Ca(OH)_2$ is 9. The solubility product (K_{sp}) of $Ca(OH)_2$ is :

(A) 0.5×10^{-15}

(B) 0.25×10^{-10}

(C) 0.125×10^{-15}

(D) 0.5×10^{-10}

Q.No. 115 The mixture that forms maximum boiling azeotrope is:

(A) Water + Nitric acid

(B) Ethanol + Water

(C) Acetone + Carbon disulphide

(D) Heptane + Octane

Q.No. 116 Which of the following statements is incorrect ?

(A) Morels and truffles are edible delicacies.

(B) Clavicepsis a source of many alkaloids and LSD

(C) Conidia are produced exogenously and ascospores endogenously...

(D) Yeasts have filamentous bodies with long thread-like hyphae.

Q.No. 117 A biocontrol agent to be a part of an integrated pest management should be

(A) narrow spectrum and symbiotic

(B) species-specific and inactive on non target organisms

(C) species-specific and symbiotic

(D) free living and broad spectrum

Q.No. 118 Which of the following organic compounds is the main constituent of Lecithin?

(A) Cholesterol

(B) Phosphoprotein

(C) Arachidonic acid

(D) Phospholipid

Q.No. 119 The Earth Summit held in Rio de Janeiro in 1992 was called :

(A) to reduce CO_2 emissions and global warming.

(B) for conservation of biodiversity and sustainable utilization of its benefits.

(C) to assess threat posed to native species by invasive weed species.

(D) for immediate steps to discontinue use of CFCs that were damaging the ozone layer.

Q.No. 120 Coronavirus animals - lions and leopards, occupy the same niche but lions predate mostly larger animals and leopards take smaller ones. This mechanism of competition is referred to as-

(A) Resource partitioning

(B) Competitive exclusion

(C) Character displacement

(D) Altruism

Q.No. 121 Drug called 'Heroin' is synthesized by :

(A) methylation of morphine

(B) acetylation of morphine

(C) glycosylation of morphine

(D) nitration of morphine

Q.No. 122 Match the following enzymes with their functions :

(a)	Restriction endonuclease	(i)	joins the DNA fragments
(b)	Restriction exonuclease	(ii)	extends primers on genomic DNA template
(c)	DNA ligase	(iii)	cuts DNA at specific position
(d)	Tag polymerase	(iv)	removes nucleotides from the ends of DNA

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

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

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

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

Q.No. 123 Angular Width of the central maxima in the Fraufifer diffraction for $\lambda = 6000$ Å is θ_0. When the same Slit is illuminated by another monochromatic light, the angular width decreases by 30%. wavelength of this light is,

(A) 6000 Å

(B) 420 Å

(C) 1800 Å

(D) 4200 Å

Q.No. 124 The work function of a photosensitive material is 4.0 eV, longest wavelength of light that can cause photon emission from the is (approximately)

(A) 31 nm

(B) 310 nm

(C) 3100

(D) 966 nm

Q.No. 125 Reversible expansion of an gas under isothermal and adiabatic conditions are as shown in the
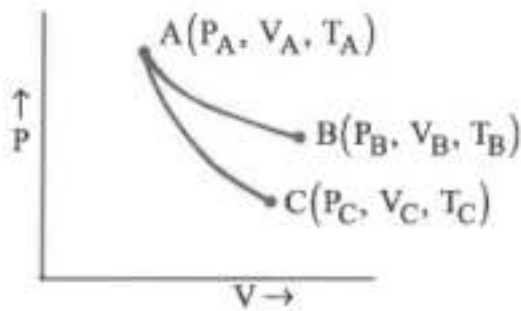
figure;   AB --> Isothermal Expansion AC --> Adiabatic expansion Which of the following options is not correct ?

(A) $w_{isothermal} > w_{adiabatic}$

(B) $T_C > T_A$

(C) $\Delta S_{isothermal} > \Delta S_{adiabatic}$

(D) $T_A > T_B$

Q.No. 126 Exploitation of bioresources of a nation by multinational companies without authorization from the concerned country is referred to as

(A) Bioethics

(B) Biowar

(C) Bioweapon

(D) Biopiracy

Q.No. 127 A copper rod of 88 cm and an aluminium rod of unknown length have their increase in length independent of increase in temperature. The length of aluminium rod is : ($\alpha_{Cu} = 1.7 \times 10^{-5}$ K^{-1}

(A) 68cm

(B) 113.9cm

(C) 88cm

(D) 68cm

Q.No. 128 What will be the sequence of mRNA produced by the following stretch of DNA ?

3' ATGCATGCATGCATG 5'   TEMPLATE STRAND
5' TACGTACGTACGTAC 3'   CODING STRAND

(A) 3' UACGUACGUACGUAC 5'

(B) 5' AUGCAUGCAUGCAUG 3'

(C) 3' AUGCAUGCAUGCAUG 5'

(D) 5' UACGUACGUACGUAC 3'

Q.No. 129 One scientist cultured Cladophora in a suspension of Azotobacter and illuminated the culture by splitting light through a prism.He observed that bacteria accumulated mainly in the region of :

(A) Orange and yellow light

(B) Blue and red light

(C) Violet and green light

(D) Indigo and green light

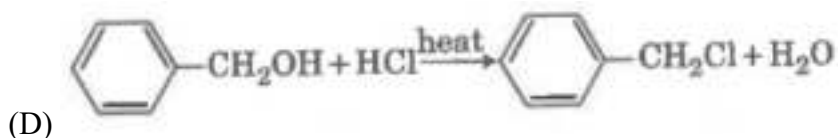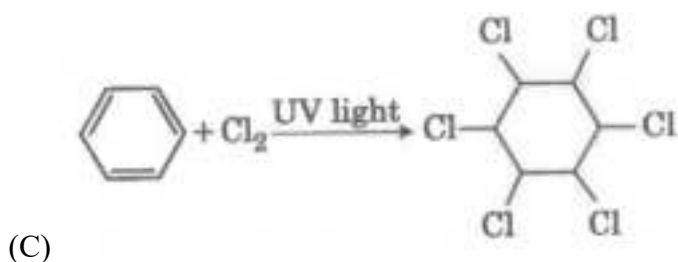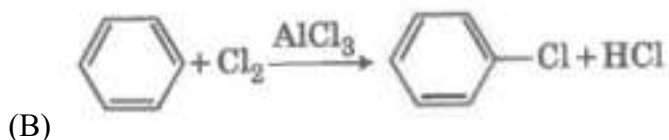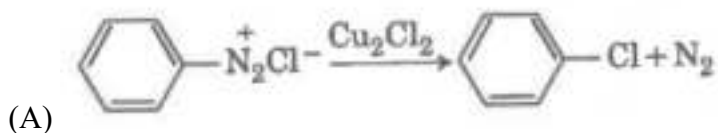**Q.No. 130** Which of the alkali metal chloride (MCl) forms its dihydrate salt (MCl.2H$_2$O) easily ?

(A) RbCl

(B) KCl

(C) Licl

(D) CsCl

Q.No. 131 Identify the correct formula of 'oleum' from the following.

(A) H$_2$SO$_4$

(B) H$_2$S$_2$O$_8$

(C) H$_2$S$_2$O$_7$

(D) H$_2$SO$_3$

Q.No. 132 Among the following, the reaction that proceeds through an electrophilic substitution, is :

(A)

(B)

(C)

(D)

Q.No. 133 Match the following genes of the Lac operon with their respective products :

(a)	i gene	(i)	β-galactosidase
(b)	z gene	(ii)	Permease
(c)	a gene	(iii)	Repressor
(d)	y gene	(iv)	Transacetylase

Select the correct option.

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

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

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

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

Q.No. 134 What type of pollination takes place in Vallisneria ?

(A) Flowers emerge above water suråce. and pollen is carried by wind.

(B) Male flowers are carried by water currents to female flowers at surface of water

(C) Pollination occurs in submerged conditions by water.

(D) Flowers emerge above the surface of water and pollination occurs by insects.

Q.No. 135 For a cell involving one electron Egjy= 0.59 V at 298 K, the equilibrium constant for the cell reaction is: [Given that a = 2.303/F =0.059 V at T = 298 K]

(A) 1.0×10^2

(B) 1.0×10^2

(C) 1.0×10^{10}

(D) 1.0×10^{30}

Q.No. 136 No new follicles develop in the luteal phase of the menstrual cycle because :

(A) LH levels are high in the luteal phase.

(B) Both FSH and LH levels are low in the luteal phase.

(C) Follicles do not remain in the ovary after ovulation.

(D) FSH levels are high in the luteal phase.

Q.No. 137 Select the hormone-releasing Intra-Uterine Devices.

(A) Vaults, LNG-20

(B) Multiload 375, Progestasert.

(C) Progestasert, LNG-20

(D) Lippes Loop, Multiload 375

Q.No. 138 A compound is formed by cation C and anion A. The anions form hexagonal close packed (hcp) lattice and the cations occupy 75% of octahedral voids. The formula of the compound is:

(A) C_2A_3

(B) C_3A_2

(C) C_3A_4

(D) C_4A_3

Q.No. 139 Humans have acquired an immune system that produces antibodies to neutralize pathogens. Still innate system is present at the time of birth because it

(A) has natural killer cells which can phagocytes and destroy microbes.

(B) provides passive passive immunity.

(C) is very specific and uses different

(D) produces memory cells for mounting fast secondary response.

Q.No. 140 Following limiting molar conductivities are given as $\lambda^o_{m(H_2SO_4)} = xScm^2mol^{-1}$ $\lambda^o_{m(K_2SO_4)} = xScm^2mol^{-1}$ $\lambda^\circ_m (CH_3COOK) = zScm^2mol^{-1}$ $\lambda^\circ_m \left(in\ Scm^2mol^{-1} \right)$ for CH_3COOH Will be

(A) x - y + z

(B) $\frac{(x-y)}{2} + z$

(C) x - y + 2z

(D) x + y + z

Q.No. 141 An electron is accelerated through a potential difference of 10,000 V. Its de Broglie wavelength is, Nearly : (m_e= 9 x 10^{-31} kg)

(A) 12.2 x 10^{-13}

(B) 12.2 x 10^{-12}

(C) 12.2 x 10^{-14}

(D) 12.2 nm

Column - A	Column - B
(i) Na_2O	(a) Neutral
(ii) Al_2O_3	(b) Basic
(iii) N_2O	(c) Acidic
(iv) Cl_2O_7	(d) Amphoteric

Q.No. 142 Match the oxide given in column B :

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

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

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

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

Q.No. 143 A person travelling in a straight line moves with a constant velocity v_1 for a certain distance 'x' and with a constant velocity v_2 for the next equal distance. The average velocity v is given by the relation

(A) $\frac{v}{2} = \frac{v_1 + v_2}{2}$

(B) $v = \sqrt{v_1 v_2}$

(C) $\frac{1}{v} = \frac{1}{v_2} + \frac{1}{v_2}$

(D) $\frac{2}{v} = \frac{1}{v_2} + \frac{1}{v_2}$

Q.No. 144 The standard electrode potential (E) values of Al^{3+}Al, Ag^+/Ag, K^+/K and Cr^{3+}/Cr are -1.66V, 0.80 V, -2.93 V and -0.74V, respectively. The correct decreasing order of reducing power of the metal is-

(A) K > Al > Ag > Cr

(B) Al > K > Ag > Cr

(C) Ag > Cr > Al > K

(D) K > Al > Cr > Ag

Q.No. 145 Which of the following oxoacids of phosphorus has the strongest reducing property?

(A) H_3PO_2

(B) H_3PO_4

(C) $H_4P_2O_3$

(D) H_3PO_3

Q.No. 146 In Euglena locomotion by …..

(A) Flagella

(B) Cilia

(C) Pseudopodia

(D) Myonemes

Q.No. 147 A mass m is attached to a thin wire and whirled in a vertical circle. The wire is most likely to break when:

(A) 'the mass is at the highest point

(B) the wire is horizontal

(C) the mass is at the lowest point

(D) inclined at an angle of 60° from vertical

Q.No. 148 In mung bean, resistance to yellow mosaic, virus and powdery mildew were brought about by :

(A) Tissue culture

(B) Hybridization and selection

(C) Mutation breeding

(D) Biofortification

Q.No. 149 In a species, the weight of newborn ranges from 2 to 5kg. 97% of the newborn with an average weight between 3 to 3.3 kg survive whereas 99% of the infants born with weights from 2 to 2.5 kg or 4.5 to 5 kg die. Which type of selection process is taking place ?

(A) Directional Selection

(B) Stabilizing Selection

(C) Disruptive Selection

(D) Cyclical Selection

Q.No. 150 Which of the following statements regarding mitochondria is incorrect ?

(A) Outer membrane is permeable to monomers of carbohydrates, fats and proteins.

(B) Enzymes of electron transport are embedded in outer membrane.

(C) Inner membrane is convoluted with infoldings.

(D) Mitochondrial matrix contains single circular DNA molecule and ribosomes.

Q.No. 151 Where is the respiratory electron transport system (ETS) located in plants ?

(A) Inner mitochondrial membrane

(B) Intermembrane space

(C) Mitochondrial matrix

(D) Outer mitochondrial membrane

Q.No. 152 In which of the following processes, heat is neither absorbed nor released by a system ?

(A) isothermal

(B) adiabatic

(C) isobaric

(D) isochoric

Q.No. 153 Average velocity of a particle executing SHM in one complete vibration is :

(A) $A\omega/2$

(B) $A\omega$

(C) $\frac{A\omega^2}{2}$

(D) zero

Q.No. 154 What is the genetic disorder in which an individual has an overall masculine development, gynaecomastia, and is sterile ?

(A) Turner's syndrome

(B) Klinefelter's syndrome

(C) Edward syndrome

(D) Down's syndrome

Q.No. 155 What is the direction of movement of sugars in phloem ?

(A) Non-multidirectional

(B) Upward

(C) Downward

(D) Bi-directional

Q.No. 156 Which of the following diatomic molecular species has only π bonds according to Molecular Orbital Theory ?

(A) O_2

(B) N_2

(C) C_2

(D) Be_2

Q.No. 157 Which of the following protocols did aim for reducing emission of chlorofluorocarbons into the atmosphere ?

(A) Montreal Protocol

(B) Kyoto Protocol

(C) Gothenburg Protocol

(D) Geneva Protocol

Q.No. 158 The radius of the first permitted Bohr orbit, for the electron, in a hydrogen atom equals 0.51 Å and its ground state energy equals -13.6 eV. If the electron in the hydrogen atom is replaced by muon [charge same as electron and mass 207 m_e], the first Bohr radius and ground state energy will be,

(A) $2.56 \times 10_{-13}$m, -2.8 keV

(B) $2.56 \times 10_{-13}$m, -13.6 eV

(C) $0.53 \times 10_{-13}$m, -3.6 eV

(D) $25.6 \times 10_{-13}$m -2.8eV

Q.No. 159 Which of the following statements is correct the origin and evolution of men ?

(A) Homo habilis probably ate meat.

(B) Neanderthal men lived in Asia between 1,00,000 and 40,000 years back.

(C) Agriculture came around 50,000 years back.
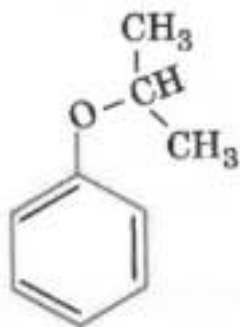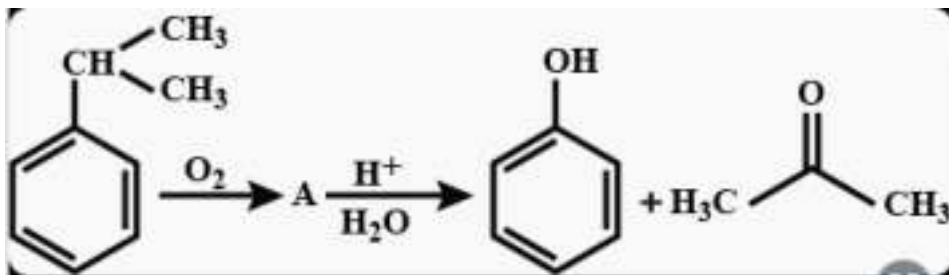
(D) The Dryopithecus and Ramapithecus primates 15 million years ago,walked like men.

Q.No. 160 Which scientist experimentally proved that DNA is the sole genetic material in bacteriophage ?
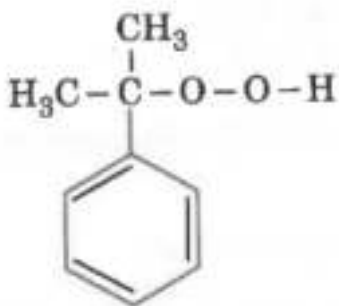
(A) Hershey and Chase

(B) Jacob and Monod

(C) Beadle and Tautum
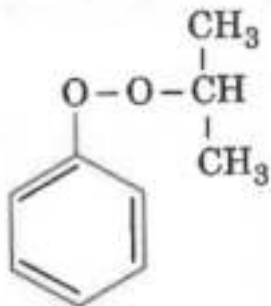
(D) Messelson and Stahl

Q.No. 161

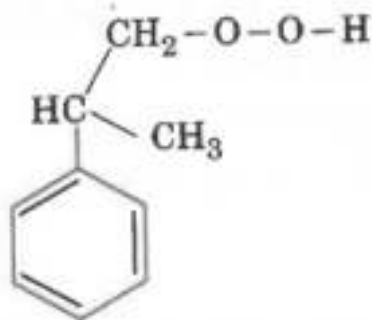The structure of intermediate A in the following reaction, is:

(A)

(B)

(C)

(D)

Q.No. 162 Which of the following glucose transporters is insulin-dependent ?

(A) GLUT I

(B) GLUT II

(C) GLUT III

(D) GLUT IV

	Column - I		Column - II
(a)	Rennin	(i)	Vitamin B_{12}
(b)	Enterokinase	(ii)	Facilitated transport
(c)	Oxyntic cells	(iii)	Milk proteins
(d)	Fructose	(iv)	Trypsinogen

Q.No. 163 Match the following.

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

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

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

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

Q.No. 164 For the second. period elements the correct increasing order of first ionisation enthalpy is:

(A) Li < Be < B < C < N < O < F < Ne

(B) Li < B < Be < C < O < N < F < Ne

(C) Li < B < Be < C < N < O < F < Ne

(D) Li < Be < B < C < O < N < F < Ne

Q.No. 165 In a double slit experiment, when light of wavelength 400 nm was used, the angular width of the first minima formed on a screen placed 1 m away, was found to be 0.2°. What will be the angular width of the first minima, if the entire experimental apparatus is immersed in water ? (μwater = 4/3)

(A) 0.266°

(B) 0.15°

(C) 0.05°

(D) 0.1°

Q.No. 166 A person standing on the floor of an elevator drops a coin. The coin reaches the floor in time t_1 if the elevator is at rest and in time t_2 if the elevator is moving uniformly. Then

(A) $t_1 > t_2$

(B) $t_1 = t_2$

(C) $t_1 < t_2$ or $t_1 > t_2$ depending upon whether the lift is going up or down

(D) $t_1 < t_2$

Q.No. 167 What map unit (Centimorgan) is adopted in the construction of genetic maps ?

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

(B) A unit of distance between two expressed genes, representing 100% cross over.

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

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

Q.No. 168 Which of the following muscular disorders is inherited ?

(A) Tetany

(B) Muscular dystrophy

(C) Myasthenia gravis

(D) Botulism

Q.No. 169 What triggers activation of protoxin to active Bt toxin of Bacillus thuringiensis in boll worm ?

(A) Body temperature

(B) Moist surface of midgut

(C) Alkaline pH of gut

(D) Acidic pH of stomach

Q.No. 170 In RNAi, the genes are silenced using :

(A) ss -RNA

(B) ds-DNA

(C) ds - RNA

(D) ss -DNA

Q.No. 171 For a reaction, activation energy $E_a = 0$ and the rate constant at 200K is $1.6 \times 10^6 s^{-1}$. The rate constant at 400 K will be - [Given that gas constant, $R = 8.314$ $JK_{-1}mol_{-1}$

(A) $1.6 \times 10^3 s^{-1}$

(B) $3.2 \times 10^6 s^{-1}$

(C) $3.2 \times 10^4 s^{-1}$

(D) $1.6 \times 10^6 s^{-1}$

Q.No. 172 The stress-strain curves are drawn for two different materials X and Y. It is observed that the ultimate strength point and the fracture point are close to each other for material X but are far apart for material Y. We can say that materials X and Y are likely to be (respectively),

(A) brittle and plastic

(B) plastic and ductile

(C) ductile and brittle

(D) brittle and ductile

Q.No. 173 Which structure(s) of proteins remains intact during the denaturation process ?

(A) secondary structure only

(B) Tertiary structure only

(C) Both secondary and tertiary structures

(D) Primary structure

Q.No. 174 The liquified gas that is used in dry cleaning along with a suitable detergent is -

(A) NO_2

(B) CO_2

(C) Water gas

(D) Petroleum gas

Q.No. 175 In the process of transcription in Eukaryotes, the RNA polymerase I transcribes —

(A) rRNAs—28S, 18S and 5.8 S

(B) Precursor of mRNA, hmRN A

(C) mRNA with additional processing, capping and tailing

(D) tRNA, 5 srRNA and snRNAs

Q.No. 176 A soap bubble, having radius of 1 mm, is blown from a detergent solution having a surface tension of 2.5×10^{-2} N/m. The pressure inside the bubble equals at a point Z, below the free surface of water in a container. Taking g = 10 m/s^2, density of water = 10^3 kg/m3, the value of Z_0 is

(A) 100 cm

(B) 10 cm

(C) 1 cm

(D) 2 cm

Q.No. 177 A 800 turn coil of effective area 0.05 m² is kept perpendicular to a magnetic field 5x 1075 T. When the plane of the coil is rotated by 90° around any of its coplanar axis in 0.1 s, the emf induced in the coil will be :

(A) 2 V

(B) 0.2 V

(C) 2 x 10⁻³ V

(D) 0.02 V

Q.No. 178 An LED is constructed from a p-n junction diode using GaAsP. The energy gap is 1.9 eV. The wavelength of the light emitted will equal to

(A) 654 Å

(B) 654 x 10⁻¹¹m

(C) 10.4 x 10⁻²⁶m

(D) 654 nm

Q.No. 179 A cylindrical conductor of radius R is carrying a constant current. The plot of the magnitude of the magnetic field, B with the distance, d, from the centre of the conductor, is correctly represented by the figure :
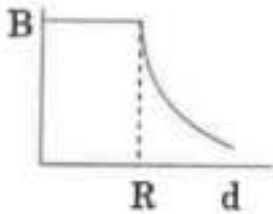
(A)
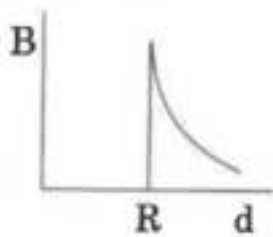
(B)
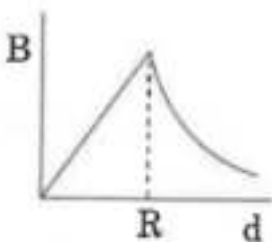
(C)
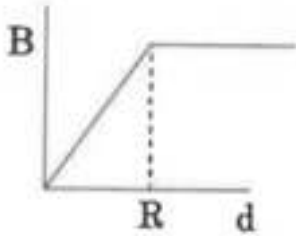
(D)

Q.No. 180 Which one of the following equipments is essentially required for growing microbes on a large scale, for industrial production of enzymes ?

(A) BODincubator

(B) Sludge digester

(C) Industrial oven

(D) Bioreactor

Answer Sheet

Q.No	Answer
Q.No. 1	(D)
Q.No. 2	(C)
Q.No. 3	(C)
Q.No. 4	(B)
Q.No. 5	(C)
Q.No. 6	(C)
Q.No. 7	(D)
Q.No. 8	(B)
Q.No. 9	(A)
Q.No. 10	(B)
Q.No. 11	(D)
Q.No. 12	(D)
Q.No. 13	(C)
Q.No. 14	(A)
Q.No. 15	(C)
Q.No. 16	(C)
Q.No. 17	(A)
Q.No. 18	(A)
Q.No. 19	(A)
Q.No. 20	(B)
Q.No. 21	(D)

Q.No. 22	(B)
Q.No. 23	(D)
Q.No. 24	(B)
Q.No. 25	(C)
Q.No. 26	(A)
Q.No. 27	(A)
Q.No. 28	(C)
Q.No. 29	(B)
Q.No. 30	(C)
Q.No. 31	(B)
Q.No. 32	(A)
Q.No. 33	(D)
Q.No. 34	(A)
Q.No. 35	(B)
Q.No. 36	(B)
Q.No. 37	(A)
Q.No. 38	(C)
Q.No. 39	(D)
Q.No. 40	(B)
Q.No. 41	(D)
Q.No. 42	(B)
Q.No. 43	(B)
Q.No. 44	(A)
Q.No. 45	(C)
Q.No. 46	(A)
Q.No. 47	(B)
Q.No. 48	(D)
Q.No. 49	(D)
Q.No. 50	(D)
Q.No. 51	(C)
Q.No. 52	(D)
Q.No. 53	(D)
Q.No. 54	(A)
Q.No. 55	(A)
Q.No. 56	(D)
Q.No. 57	(C)
Q.No. 58	(B)
Q.No. 59	(A)

Q.No. 60	(C)
Q.No. 61	(A)
Q.No. 62	(C)
Q.No. 63	(D)
Q.No. 64	(C)
Q.No. 65	(C)
Q.No. 66	(D)
Q.No. 67	(C)
Q.No. 68	(B)
Q.No. 69	(C)
Q.No. 70	(C)
Q.No. 71	(C)
Q.No. 72	(B)
Q.No. 73	(D)
Q.No. 74	(B)
Q.No. 75	(B)
Q.No. 76	(B)
Q.No. 77	(A)
Q.No. 78	(D)
Q.No. 79	(D)
Q.No. 80	(B)
Q.No. 81	(B)
Q.No. 82	(C)
Q.No. 83	(A)
Q.No. 84	(A)
Q.No. 85	(D)
Q.No. 86	(B)
Q.No. 87	(D)
Q.No. 88	(B)
Q.No. 89	(A)
Q.No. 90	(B)
Q.No. 91	(A)
Q.No. 92	(C)
Q.No. 93	(D)
Q.No. 94	(C)
Q.No. 95	(D)
Q.No. 96	(A)
Q.No. 97	(A)

Q.No. 98	(C)
Q.No. 99	(D)
Q.No. 100	(B)
Q.No. 101	(A)
Q.No. 102	(C)
Q.No. 103	(D)
Q.No. 104	(A)
Q.No. 105	(D)
Q.No. 106	(A)
Q.No. 107	(D)
Q.No. 108	(D)
Q.No. 109	(C)
Q.No. 110	(C)
Q.No. 111	(B)
Q.No. 112	(B)
Q.No. 113	(C)
Q.No. 114	(A)
Q.No. 115	(A)
Q.No. 116	(D)
Q.No. 117	(B)
Q.No. 118	(D)
Q.No. 119	(B)
Q.No. 120	(A)
Q.No. 121	(B)
Q.No. 122	(D)
Q.No. 123	(D)
Q.No. 124	(A)
Q.No. 125	(B)
Q.No. 126	(D)
Q.No. 127	(D)
Q.No. 128	(D)
Q.No. 129	(B)
Q.No. 130	(D)
Q.No. 131	(A)
Q.No. 132	(B)
Q.No. 133	(C)
Q.No. 134	(B)
Q.No. 135	(C)

Q.No. 136	(B)
Q.No. 137	(C)
Q.No. 138	(C)
Q.No. 139	(A)
Q.No. 140	(B)
Q.No. 141	(B)
Q.No. 142	(A)
Q.No. 143	(D)
Q.No. 144	(D)
Q.No. 145	(C)
Q.No. 146	(A)
Q.No. 147	(C)
Q.No. 148	(C)
Q.No. 149	(B)
Q.No. 150	(B)
Q.No. 151	(A)
Q.No. 152	(B)
Q.No. 153	(D)
Q.No. 154	(B)
Q.No. 155	(D)
Q.No. 156	(C)
Q.No. 157	(A)
Q.No. 158	(D)
Q.No. 159	(B)
Q.No. 160	(A)
Q.No. 161	(B)
Q.No. 162	(D)
Q.No. 163	(B)
Q.No. 164	(B)
Q.No. 165	(B)
Q.No. 166	(A)
Q.No. 167	(C)
Q.No. 168	(B)
Q.No. 169	(C)
Q.No. 170	(C)
Q.No. 171	(D)
Q.No. 172	(A)
Q.No. 173	(D)

Q.No. 174	(B)
Q.No. 175	(A)
Q.No. 176	(C)
Q.No. 177	(D)
Q.No. 178	(D)
Q.No. 179	(C)
Q.No. 180	(B)