CUET-PG Zoology- 2022

First shift

(PART-B)

QUESTION PAPER ANALYSIS

Pranav Kumar

Pathfinder Academy, New Delhi, India

Sl. No.26
QBID:1077001

Choose the correct sequence for protein transport in a cell.

(1) ER → Golgi complex → Plasma membrane

(2) Nucleus → Golgi complex → Plasma membrane

(3) Golgi complex → ER → Lysosome → Plasma membrane

(4) Cytosol → Nucleus → Plasma membrane

Answer 1

The water-soluble proteins other than ER-resident proteins are destined either for secretion or for residence in the lumen of another organelle. Proteins destined to be secreted move through the secretory pathway in the following order:

RER → Golgi cisternae → secretory vesicles → cell exterior.

Sl. No.27
QBID:1077002

Enzyme responsible for relaxing positive supercoiling of DNA in prokaryotes

(1) Type I topoisomerase
(2) DNA gyrase
(3) Catenase
(4) DNA ligase

Answer 1

Type I topoisomerase are primarily responsible for relaxing positively or negatively supercoiled DNA. DNA gyrase belongs to type II topoisomerase has the ability to remove positive supercoiling and introduce negative supercoiling into DNA using the free energy from ATP hydrolysis.

Sl. No.28
QBID:1077003

Sudan Black is used for staining of

(1) Protein
(2) Lipid
(3) Carbohydrate
(4) Cytoskeleton

Answer 2

Sudan Black is a lipophilic synthetic dye. It stains lipids, particularly lipid droplets, in various biological samples. Sudan Black has an affinity for lipids and can selectively bind to fatty substances, such as triglycerides and lipoproteins.

Sl. No.29
QBID:1077004

Sodium – Potassium ATPase transports

(1) 3 Na^+ In and 2 K^+ Out of the cell

(2) 2 K^+ In and 3 Na^+ Out of the cell

(3) 3 K^+ In and 2 Na^+ Out of the cell

(4) 2 K^+ Out and 2 Na^+ In of the cell

Answer 2

Transport of Na^+ and K+ by carrier protein, Na^+-K^+ ATPase (or Na^+-K^+ pump), is the most common example of primary active transport. The Na^+-K^+ ATPase couples ATP hydrolysis with the active transport of 3 Na^+ ions out of the cell in exchange for 2 K^+ ions during each enzyme cycle.

Sl. No.30
QBID:1077005

Voltage-Dependent Anion-selective Channels (VDACs) allow passage of small molecules across

(1) Endoplasmic reticulum
(2) Outer membrane of mitochondria
(3) Ribosome
(4) Nucleus

Answer 2

The outer mitochondrial membrane contains specialized transport proteins called *mitochondrial porin* which allows free passage for various molecules into the intermembrane space of the mitochondria. Mitochondrial porins are *voltage-dependent anion-selective channels* (*VDAC*), adopt an open conformation at low or zero membrane potential and a closed conformation at potentials above 30-40 mV.

Sl. No.31
QBID:1077006

Which of the following is a non-parametric test ?

(1) Chi-square test
(2) T-test
(3) F-test
(4) Z-test

Answer 1

Chi-Square Test is a non-parametric test designed to analyze group differences when the dependent variable is measured at a nominal level. F-Test is a parametric test of hypothesis testing. Z-Test is a parametric test to determine whether the means are different when the population variance is known and the sample size is large. T-Test is a parametric test to check the significance of the difference of the mean values when the sample size is small (i.e., less than 30) and when the population standard deviation is not available.

Sl. No.32
QBID:1077007

Which of the following is known as positional average ?

(1) Mean deviation
(2) Standard deviation
(3) Median
(4) Mean

Answer 3

Positional averages are calculated based on the position of particular value in the given dataset. In median, the middle most value of the series is taken as the representative value. Therefore, median is a positional average.

Sl. No.33
QBID:1077008

Haplodiploid system of sex determination is found in

(1) Humans
(2) Grasshoppers
(3) Birds
(4) Honey bees

Answer 4

In *haplodiploid systems*, as in honey bees, male progeny normally develops from unfertilized eggs, which are haploid and have just one set of chromosomes. The fertilized honey bee eggs, which are diploid and have two sets of chromosomes, differentiate into queens and worker bees. Thus, in honey bees, sex is determined by the fertilization or non-fertilization of eggs, rather than the presence or absence of sex chromosomes.

Sl. No.34
QBID:1077009

Example of multiple allelism is

(1) ABO blood grouping
(2) Drosophila eye colour
(3) MN blood grouping
(4) Pea plant height

Answer 1

When more than two different forms of a given gene exist in a species, they are referred to as *multiple alleles*.
A classical example of multiple alleles is found in the *ABO blood group system* of humans.

Sl. No.35
QBID:1077010

When one gene masks the effect of another gene in a phenotype, then it is known as:

(1) Pleiotropy
(2) Epistasis
(3) Homeostasis
(4) Incomplete dominance

Answer 2

A type of gene interaction in which the expression of one gene pair masks the effect of another gene pair, it is termed as *epistasis*. In epistasis, a gene that masks the expression of another gene is said to be *epistatic*, and a gene whose expression is masked is said to be *hypostatic*.

Sl. No.36
QBID:1077011

The association in which population of one organism is benefitted and population of the other is unaffected is known as

(1) Symbiosis
(2) Commensalism
(3) Mutualism
(4) Parasitism

Answer 2

Commensalism (means '*at table together*') is a symbiotic relationship between two species in which one species benefits and the other neither benefits nor is harmed. Often, the host species provides a home and/or transportation for the other species. One very common example of commensalism is *epiphytes* (e.g., some tropical orchids) grow in branches of tropical trees. Epiphytes use other plants for support and increased exposure to sunlight and rain.

Sl. No.37
QBID:1077012

Nanda Devi Biosphere Reserve is located in which State ?

(1) Tamil Nadu
(2) Uttarakhand
(3) Odisha
(4) Meghalaya

Answer 2

Nanda Devi Biosphere Reserve is a protected area located in the state of Uttarakhand, India. It was established in 1982 and was later designated as a UNESCO World Heritage Site in 1988.

Sl. No.38
QBID:1077013

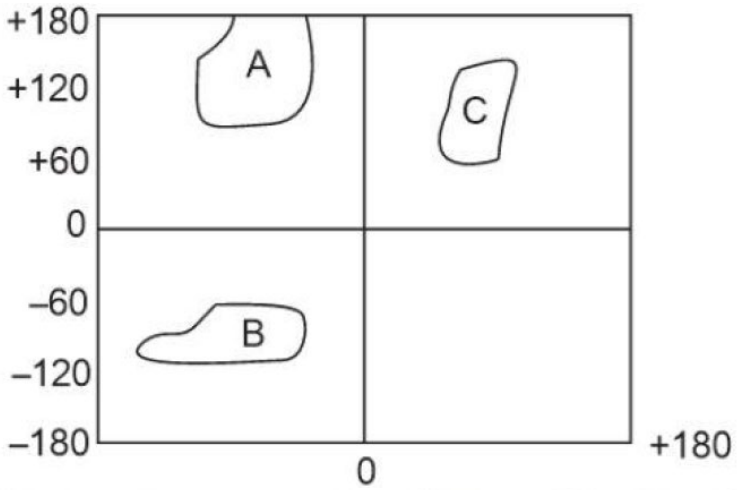
Genetic material of Coronavirus is

(1) Single-stranded RNA
(2) Double-stranded RNA
(3) Single-stranded DNA
(4) Double-stranded DNA

Answer 1

The genetic material of the coronavirus (SARS-CoV-2) is RNA. The viral genome consists of a single-stranded, positive-sense RNA that is approximately 30,000 nucleotides in length.

Sl. No.39
QBID:1077014



In the above mentioned Ramachandran Plot, A and B represent the following respectively

(1) Right-handed α-helix and left-handed α-helix
(2) Right-handed α-helix and β-pleated sheet
(3) β-pleated sheet and left-handed α-helix
(4) β-pleated sheet and right-handed α-helix

Answer 4

Sl. No.40
QBID:1077015

Phospholipase C cleaves phosphotidyl-inositol 4, 5, bisphosphate into the following:

(1) Phosphotidyl-choline and Phosphotidic acid

(2) Phosphotidic acid and Choline

(3) Inositol 1, 4, 5-triphosphate and diacylglycerol

(4) Triacylglycerol and Inositol-triphosphate

Answer 3

the plasma-membrane-bound enzyme *phospholipase C* (**PLC**) cleaves phosphatidylinositol 4,5-bisphosphate (**PIP2**) to generate two second messengers: *inositol 1,4,5-trisphosphate* (**IP3**) and *diacylglycerol* (**DAG**).

Sl. No.41
QBID:1077016

The formation of hypoblast in birds is a result of

(1) Epiboly
(2) Delamination
(3) Invagination
(4) Involution

Answer 2

The formation of hypoblast in birds involves delamination, not epiboly or invagination. Delamination is the process by which a small group of cells at the anterior end of the blastodisc separates from the rest of the cells and moves down towards the yolk, forming the hypoblast. During avian development, the blastodisc, which is a single layer of cells located on top of the yolk, undergoes cellular rearrangement to form two layers: the hypoblast and the epiblast.

Sl. No.42
QBID:1077017

Lysozyme cleaves peptidoglycan at

(1) N-acetyl muramic acid and N-acetyl glucosamine

(2) N-acetyl glucosamine and N-acetyl muramic acid

(3) N-acetyl muramic acid and N-acetyl muramic acid

(4) N-acetyl glucosamine and N-acetyl glucosamine

Answer 1

Lysozyme (EC 3.2.1.17) is a hydrolytic enzyme. It cleaves the β (1–4) glycosidic bond that connects *N*-acetyl muramic acid (**NAM**) with the fourth carbon atom of *N*-acetylglucosamine (**NAG**) of peptidoglycan cell wall present in eubacteria.

Sl. No.43
QBID:1077018

Direct Greenhouse gases do not include

(1) Methane
(2) Carbon dioxide
(3) Nitrous oxide
(4) Sulphur Dioxide

Answer 4

Many gases present in the earth's atmosphere behave as 'greenhouse gases'. Many greenhouse gases present naturally in the atmosphere, such as *carbon dioxide*, *methane*, *water vapour* and *nitrous oxide*, while others are synthetic i.e. man-made. Those that are synthetic greenhouse gases include *chlorofluorocarbons* (CFCs), *hydrofluorocarbons* (HFCs) and *perfluorocarbons* (PFCs).

Sl. No.44
QBID:1077019

Which one of the following technique is used for the characterisation of RNA ?

(1) Western blotting
(2) Southern blotting
(3) Northern blotting
(4) Eastern blotting

Answer 3

Northern blotting is a laboratory technique used to detect and quantify specific RNA molecules in a sample. It is a variation of the Southern blotting technique used for DNA analysis. Western blotting is used to detect and analyze specific proteins in a sample.

Sl. No.45
QBID:1077020

In the formation of agarose gel, which one of the following bonds is involved ?

(1) Van der Waals interaction
(2) Intra-chain hydrogen bonding
(3) Inter and Intra-chain hydrogen bonding
(4) Disulphide bond

Answer 3

Agarose is a linear polysaccharide that is derived from seaweed and is composed of repeating units of agarobiose, which is a disaccharide consisting of D-galactose and 3,6-anhydro-L-galactose. Agarose gel is a commonly used in electrophoresis for separating nucleic acids (DNA and RNA) and proteins based on their size.

Sl. No.46
QBID:1077021

Melatonin is derived from which of the following?

(1) Epinephrine
(2) Nor-epinephrine
(3) Serotonin
(4) Histamine

Answer 3

The pineal gland secretes *melatonin*, an amine hormone derived from *serotonin* that itself is derived from the amino acid tryptophan. Melatonin is the hormone of darkness.

Sl. No.47
QBID:1077022

Which one of the following is known as pacemaker of the heart?

(1) Sino-Atrial Node
(2) Ario -Ventricular Node
(3) Purkinje Fibres
(4) Bundle of His

Answer 1

Cardiac action potentials normally begin in the **sinoatrial node** (act as the heart's *pacemaker*, initiating cardiac action potentials that causes contraction of the heart), located in the right atrial wall.

Sl. No.48
QBID:1077023

In the stomach, hydrochloric acid (HCl) is secreted by

(1) Chief cells
(2) Parietal cells
(3) Enterochromaffin cells
(4) Mucous cells

Answer 2

Chief cells (or zymogen or peptic cells): It secretes *pepsinogen* and *gastric lipase.*
Parietal cells (or oxyntic cells): It secretes *HCl* (gastric acid) and *intrinsic factor*.

Sl. No.49
QBID:1077024

Reabsorption of water via the distal convoluted tubule is by which of the following?

(1) Rennin and angiotensin
(2) Aldosterone
(3) Vasopressin
(4) Glucocorticoid

Answer 3

Antidiuretic hormone (**vasopressin**) released by the posterior lobe of the pituitary plays a role in water reabsorption by the *distal convoluted tubule* and the collecting duct of the nephron. ADH increases the water reabsorption.

Sl. No.50
QBID:1077025

Hormone responsible for metamorphsis in frog is :-

(1) Ecdysone
(2) Juvenile hormone
(3) Growth hormone
(4) Thyroid hormone

Answer 4

The process of metamorphosis in frog is triggered by the secretion of ***thyroid hormone*** from the thyroid gland in response to environmental cues such as temperature and photoperiod. **Ecdysone** is a steroid hormone that plays a critical role in the development and growth of insects, particularly during molting and metamorphosis.

Sl. No.51
QBID:1077026

Embryonic cleavage in mammals is

(1) Rotational cleavage
(2) Radial cleavage
(3) Bilateral cleavage
(4) Discoidal cleavage

Answer 1

Mammalian eggs have no yolk (alecithal eggs) and blastomeres created during cleavage are of equal size. The pattern of cleavage is **rotational**.

Radial cleavage (e.g. echinoderms)

Spiral cleavage (e.g. annelids)

Bilateral cleavage (e.g. tunicates)

Rotational cleavage (e.g. mammal)

Sl. No.52
QBID:1077027

Neoteny is exhibited by :-

(1) Axolotl larva

(2) Zoea larva

(3) Bipinnaria larva

(4) Planula larva

Answer 1

Neoteny is a term used in biology to describe a process where an organism retains juvenile or larval traits into adulthood. One example of neoteny is the ***axolotl***, a species of salamander that retains its larval features throughout its life. Axolotls have external gills, a fin-like tail, and the ability to regenerate limbs, which are traits typically found only in the larval stage of other salamanders.

Sl. No.53
QBID:1077028

The six-kingdom classification was proposed by whom?

(1) R.H. Whittaker
(2) Carl Woese
(3) Carolus Linnaeus
(4) Herbert Land

Answer 2

In year 1969, Robert H. Whittaker, an American taxonomist, described a five-kingdom classification. Six kingdom classification was proposed by Carl Woese. In 1977, Carl Woese and colleagues proposed the fundamental subdivision of the prokaryotes into the Eubacteria (later called the Bacteria) and Archaebacteria (later called the Archaea), based on ribosomal RNA structure.

Sl. No.54
QBID:1077029

The structural basis in sponges is provided by which of the following?

(1) Pinacocytes
(2) Choanocytes
(3) Porocytes
(4) Amoebocytes

Answer 3

Sponges are primitive multicellular animals with *cellular grade of organization*. They have no fixed body shape and no plane of symmetry. A whole sponge can be regenerated from a few separated cells. Sponges can almost be regarded not as individuals but as colonies of separate cells. **Porocytes** play a critical role in the structural organization of sponges. These specialized cells are responsible for creating and maintaining the water channels or canals that are essential for feeding, gas exchange, and waste removal in sponges.

Sl. No.55
QBID:1077030

Methylation of Uracil forms which of the following?

(1) Adenine
(2) Cytosine
(3) Guanine
(4) Thymine

Answer 4

Methylation of uracil refers to the addition of a methyl group to the nitrogen atom at the 5th position of the pyrimidine ring in the nucleobase uracil. This modification results in the formation of 5-methyluracil, which is also known as **thymine**.

Sl. No.56
QBID:1077031

Which of the enzyme catalyses the formation of peptide bond between two amino acids?

(1) Peptidases
(2) Peptidyltransferase
(3) Phosphodiesterase
(4) Proteases

Answer 2

Enzyme *peptidyl transferase* catalyzes the formation of a peptide bond between two amino acids. Peptidyl transferase activity resides in the 23S rRNA of large 50S ribosomal subunit in case of bacteria.

Sl. No.57
QBID:1077032

Histone Acetyl Transferase (HAT) acetylates which amino acid of histone ?

(1) Lysine
(2) Histidine
(3) Serine
(4) Proline

Answer 1

Acetyl groups are added to the lysine amino acid residues in the histone tail. Enzyme that acetylate histones are called **histone acetyltransferases** (HATs), commonly known as *histone acetylases*.

Sl. No.58
QBID:1077033

Which of the following immune cells are known as polymorphonuclear (PMN) leucocytes ?

(1) Macrophages
(2) Neutrophils
(3) Monocytes
(4) Eosinophils

Answer 2

Neutrophil contains small, evenly distributed granules. The cytoplasmic granules stain slightly pink. The nucleus has three to five lobes. As the cells age, the number of nuclear lobes increases. Because older neutrophils have several differently shaped nuclear lobes, they are often called *polymorphonuclear leukocytes* (PMNs). Neutrophils are phagocytic cells.

Sl. No.59
QBID:1077034

Cytotoxic T cells are :-

(1) $CD3^+ CD8^+$
(2) $CD3^+ CD4^+$
(3) $CD4^+ CD8^+$
(4) $CD8^+ CD3^-$

Answer 1

T cells are divided into two major cell types— *T helper cells* (T_H cells) and *T cytotoxic cells* (T_C cells)—that can be distinguished from one another by the presence of either CD4 or CD8 membrane glycoproteins on their surfaces. T cells displaying CD4 generally function as T_H cells whereas those displaying CD8 generally function as T_C cells. **CD8** and **CD3** are both cell surface markers that are expressed on the surface of cytotoxic T cells.

Sl. No.60
QBID:1077035

MHC-II is expressed by which of the following?

(1) All nucleated cells
(2) Antigen presenting cells
(3) RBCs
(4) All leukocytes

Answer 2

Class II MHC genes express MHC molecule *constitutively* (i.e., under all conditions) only on specialized *antigen presenting cells* (**APCs**). Class I MHC molecules are expressed on most nucleated cells.

Sl. No.61
QBID:1077036

Tetrapods and insects first appeared during which period?

(1) Silurian
(2) Ordovician
(3) Devonian
(4) Permian

Answer 3

The first tetrapods, land-living vertebrates , appeared during the Devonian, as did the first terrestrial arthropods, including wingless insects and the earliest arachnids.

Tetrapods – Late Devonian period

Insects – Silurian period

Wingless insects – Late Devonian period

Sl. No.62
QBID:1077037

Molecular clock concept used to measure evolutionary changes is based on:

(1) ^{14}C isotope embedded in the organic content of an organism

(2) Cyclic changes in the content of some key regulatory molecules

(3) Circadian rhythms

(4) Some genes or gene regions of genome evolve at constant rate

Answer 4

The *molecular clock* is a technique in molecular evolution to relate the time that the two species diverged to the number of molecular differences measured between the species' DNA sequences or proteins. It is sometimes called a gene clock or evolutionary clock. The concept of molecular clock is based on hypothesis that DNA and protein sequences evolve at a rate that is relatively constant over time and among different organism.

Sl. No.63
QBID:1077038

Which one of the following is a post-zygotic barrier in speciation ?

(1) Behavioral Isolation
(2) Habitat Isolation
(3) Temporal Isolation
(4) Hybrid Sterility

Answer 4

Postzygotic isolation has referred to developmental defects in hybrids that lead to full or partial inviability and/or infertility. It includes hybrid inviability as well as *hybrid sterility*.

Sl. No.64
QBID:1077039

The area that contains at least 1500 species of vascular plants as endemic species along with at least 70% of habitat loss is designated as :-

(1) National Park
(2) Biosphere Reserve
(3) Biodiversity Hotspot
(4) Ecologically Sensitive Area (ESA)

Answer 3

The concept of biodiversity hotspots originated with British ecologist and writer Norman Myers in 1988. To qualify as a hotspot, a region must meet two strict criteria: it must contain at least 1,500 species of vascular plants (>0.5 percent of the world's total) as endemics, and it has to have lost at least 70 percent of its original habitat.

Sl. No.65
QBID:1077040

Ascaris lumbricoides is

(1) Acoelomate
(2) Pseudocoelomate
(3) Coelomate
(4) Nephrocoelomate

Answer 2

Aschelminthes (such as *Ascaris*) include **pseudocoelomates** characterized by the presence of a cavity, the pseudocoel between the gut and body wall. Cavity is not lined with mesodermal epithelium. Aschelminthes was formerly known as *Nemathelminthes.*

Sl. No.66
QBID:1077041

Match List I with List II

	List I		List II
A.	Diaphysis	I.	The regions between the diaphysis and epiphysis
B.	Epiphysis	II.	A thin membrane that lines the internal bone surface
C.	Metaphysis	III.	The proximal and distal end of the bone
D.	Endosteum	IV.	The long cylindrical main portion of the bone

Choose the correct answer from the options given below :

(1) A-I, B-III, C-IV, D-II
(2) A-IV, B-III, C-I, D-II
(3) A-I, B-IV, C-II, D-III
(4) A-IV, B-II, C-I, D-III

Answer 2

Diaphysis is the long, cylindrical main portion of a bone, also known as the shaft.
Epiphysis refers to the rounded end of a long bone, separated from the diaphysis by the metaphysis.
Metaphysis is the region between the diaphysis and epiphysis.
Endosteum is a thin membrane that lines the internal bone surface.

Sl. No.67
QBID:1077042

Match List I with List II

	List I		List II
A.	Renal calculi	I.	A condition characterized by proteinuria and hyperlipidemia
B.	Nephrotic syndrome	II.	Kidney tubules become riddled with cysts
C.	Renal failure	III.	Kidney stone
D.	Polycystic kidney disease	IV.	Cessation of glomerular filtration

Choose the correct answer from the options given below :

(1) A-I, B-IV, C-II, D-III
(2) A-III, B-IV, C-II, D-I
(3) A-II, B-III, C-I, D-IV
(4) A-III, B-I, C-IV, D-II

Answer 4

Renal calculi, also known as kidney stones, are hard mineral and salt deposits that form inside the kidneys or urinary tract. **Renal failure**, also known as kidney failure, refers to a condition where the kidneys lose their ability to adequately filter waste products and excess fluids from the blood**. Polycystic kidney disease** (PKD) is a genetic disorder characterized by the growth of numerous cysts in the kidneys. **Nephrotic syndrome** is a kidney disorder characterized by the leakage of large amounts of protein, primarily albumin, into the urine.

Sl. No.68
QBID:1077043

Match List I with List II

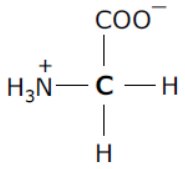
	List I		List II
A.	Glycine	I.	Aromatic amino acid
B.	Tyrosine	II.	Amino acid having chiral C-atom in side chain
C.	Tryptophan	III.	Optically inactive
D.	Threonine	IV.	Amino acid undergoes phosphorylation

Choose the correct answer from the options given below :

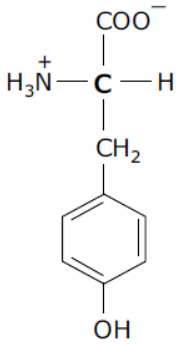
(1) A-IV, B-III, C-II, D-I
(2) A-III, B-II, C-IV, D-I
(3) A-III, B-I, C-IV, D-II
(4) A-III, B-IV, C-I, D-II

Answer 4

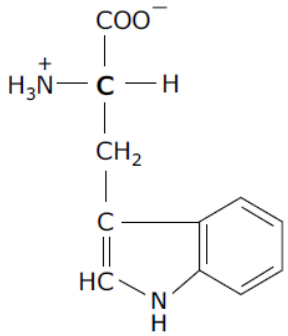
Glycine



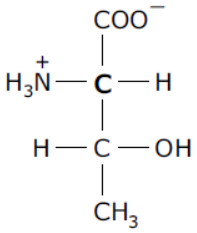
Tyrosine



Tryptophan



Threonine



Sl. No.69
QBID:1077044

Match List I with List II

	List I		List II
A.	Smooth endoplasmic reticulum	I.	Protein synthesis
B.	Rough endoplasmic reticulum	II.	Detoxification
C.	Lysosome	III.	Oxidative phosphorylation
D.	Mitochondria	IV.	Intracellular digestion

Choose the correct answer from the options given below :

(1) A-II, B-I, C-IV, D-III
(2) A-I, B-II, C-III, D-IV
(3) A-II, B-III, C-I, D-IV
(4) A-I, B-IV, C-II, D-III

Answer 1

Sl. No.70
QBID:1077045

Match List I with List II

	List I		List II
A.	Allopatric Species	I.	Species inhabiting the same geographical area
B.	Sympatric Species	II.	Species inhabiting different geographical areas
C.	Sibling Species	III.	Species occupying separate areas that share a common boundary
D.	Parapatric Species	IV.	Species which are morphologically identical but reproductively isolated

Choose the correct answer from the options given below :

(1) A-II, B-I, C-IV, D-III
(2) A-I, B-II, C-III, D-IV
(3) A-I, B-III, C-IV, D-II
(4) A-II, B-IV, C-I, D-III

Answer 1

Allopatric speciation occurs due to geographic isolation. ***Sympatric speciation***, conversely, does not require geographic isolation; instead, it relies on the development of reproductive isolation mechanisms to allow divergence of the two sub-populations. ***Parapatric speciation*** is a form of speciation in which the evolution of reproductive isolating mechanisms occurs when a population enters a new niche or habitat *within the range of the parent species*.

Sl. No.71
QBID:1077046

Match List I with List II

	List I		List II
A.	Bone marrow	I.	Hematopoiesis
B.	Spleen	II.	T-cell maturation
C.	Lymph Node	III.	Filtration of blood-borne antigen
D.	Thymus	IV.	Filtration of tissue-associated antigen

Choose the correct answer from the options given below :

(1) A-I, B-IV, C-II, D-III
(2) A-III, B-I, C-II, D-IV
(3) A-II, B-I, C-IV, D-III
(4) A-I, B-III, C-IV, D-II

Answer 4

Spleen and **lymph nodes** are the highly organized secondary lymphoid organs. The secondary lymphoid organs have two major functions: They are highly efficient in trapping and concentrating foreign substances, and they are the main sites of production of antibodies and the induction of antigen-specific T cells.

Sl. No.72
QBID:1077047

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

Assertion A :

Hemoglobin binding to oxygen is non-cooperative.

Reason R :

Hemoglobin is the oxygen carrier.

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

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

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

(3) A is correct but R is not correct

(4) A is not correct but R is correct

Answer 4

Hemoglobin exhibits *cooperative binding*. The binding of the first heme in the hemoglobin molecule with oxygen increases the affinity of the second heme for oxygen and oxygenation of the second increases the affinity of the third, etc., so that the affinity of hemoglobin for the fourth oxygen molecule is many times greater than that for the first. Nearly all the oxygen carried by whole blood in animals is bound and transported by hemoglobin in erythrocytes (red blood cells).

Sl. No.73
QBID:1077048

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

Assertion A :

Scientists believe that RNA is the primitive genetic material.

Reason R :

RNA has the ability to catalyze chemical reactions.

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

(1) Both A and R are correct and R is the correct explanation of A
(2) Both A and R are correct but R is not the correct explanation of A
(3) A is correct but R is not correct
(4) A is not correct but R is correct

Answer 1

The concept of an *RNA World* answers the fundamental question about the nature of replicating molecules present at the beginning of life. This hypothesis proposes that RNA was actually the first life-form on earth. This hypothesis is supported by the RNA's ability to store, transmit, and duplicate genetic information, just like DNA does, and catalyze chemical reactions, just like protein does.

Sl. No.74
QBID:1077049

Arrange the events in correct order of sequence :

A. Cleavage
B. Fertilization
C. Morula
D. Gastrula
E. Blastula

Choose the correct answer from the options given below :

(1) A, B, E, C, D
(2) B, A, C, E, D
(3) B, C, A, E, D
(4) B, C, E, D, A

Answer 2

Sl. No.75
QBID:1077050

Arrange the following in decreasing order (size).

A. Mitochondria
B. Proteins
C. Ribosomes
D. Human egg
E. Nucleus

Choose the correct answer from the options given below :

(1) D, A, C, B, E
(2) D, A, C, E, B
(3) D, E, C, A, B
(4) D, E, A, C, B

Answer 4

Sl. No.76
QBID:1077051

Arrange the following in sequence of molecular events.

A. Transcription
B. Nuclear Export
C. Translation
D. Splicing
E. Glycosylation

Choose the correct answer from the options given below :

(1) A, D, B, C, E
(2) A, B, C, D, E
(3) C, D, E, A, B
(4) B, A, E, C, D

Answer 1

Sl. No.77
QBID:1077052

Arrange the following in the correct sequence of DNA packaging.

A. DNA Scaffold
B. Nucleosome formation
C. Chromatosome formation
D. Histone Dimerization
E. 30 nm fiber

Choose the correct answer from the options given below :

(1) D, A, C, E, B
(2) D, C, B, E, A
(3) D, B, C, E, A
(4) D, B, E, C, A

Answer 2

Packing of 30 nm fiber leads to a fiber of about 300 nm diameter. The 30 nm fiber is organized into loops of 40–90 kb, stabilized by proteinaceous structure termed as chromosome scaffold. AT-rich DNA sequences that attach the 30 nm fiber to the chromosome scaffold are known as scaffold attachment regions (SARs). Nucleosomes that contain linker histones are referred to as **chromatosomes**. A single linker histone is attached to each chromatosome, but the precise positioning of this linker histone is not known.

Sl. No.78
QBID:1077053

Arrange the following components of complement system as per their involvement in initiation of alternative pathways of complement system.

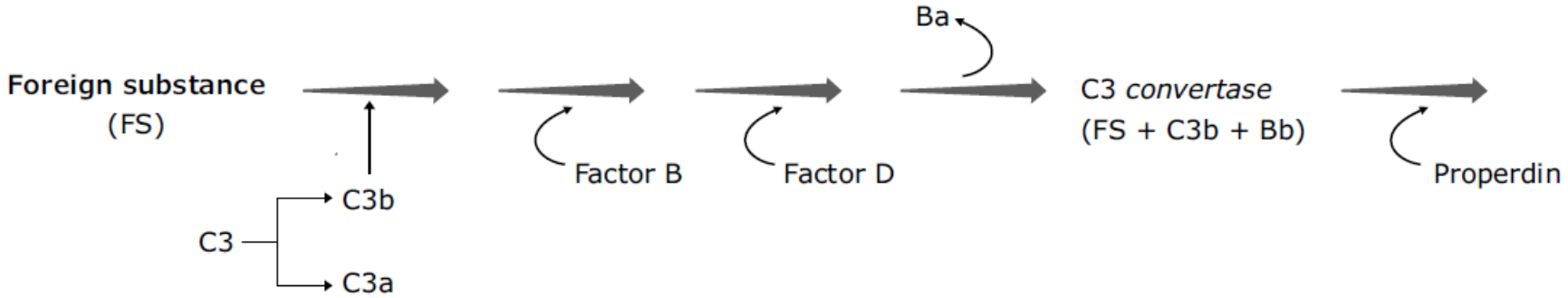
A. Factor D
B. Factor B
C. C3b
D. Properdin

Choose the correct answer from the options given below :

(1) C, A, B, D
(2) A, C, B, D
(3) A, B, C, D
(4) D, C, B, A

Answer 1 (but order should be C, B, A, D)

The alternative pathway is *antibody-independent*. This pathway of complement activation is triggered by almost any foreign substance. This pathway of complement activation involves four serum proteins: C3, factor B, factor D, and **properdin**, also known as **factor P**.



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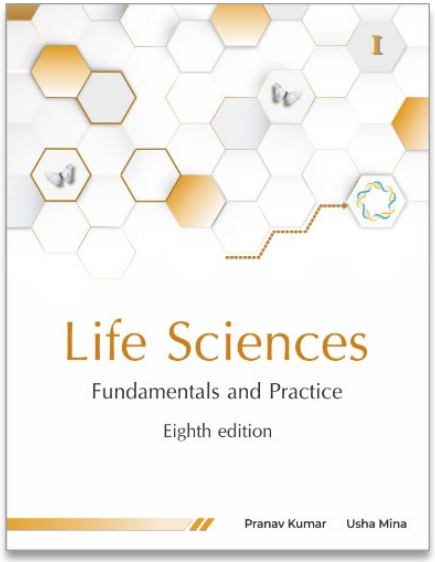

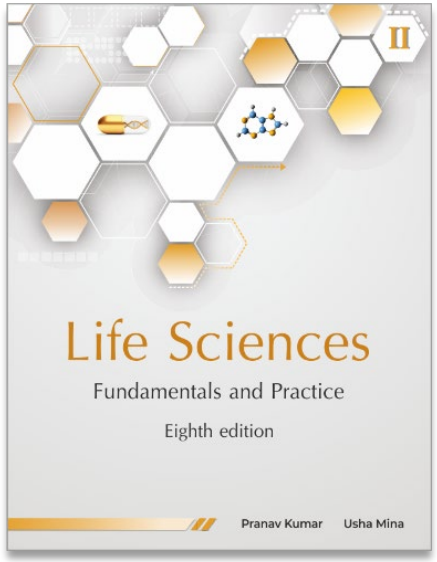

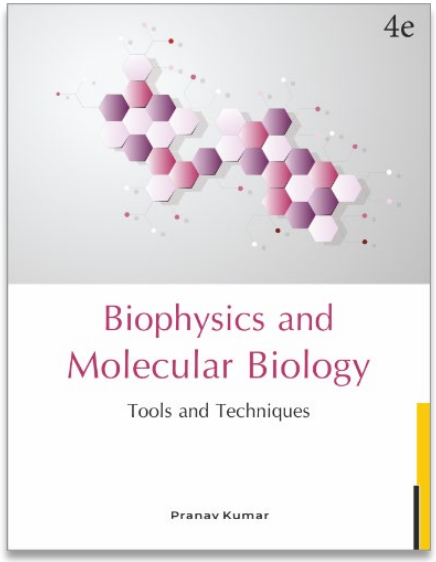

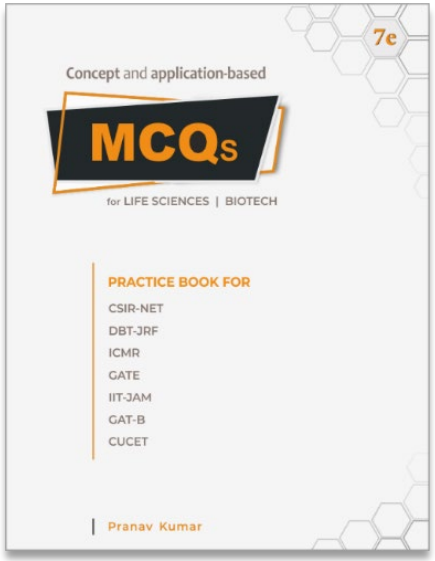

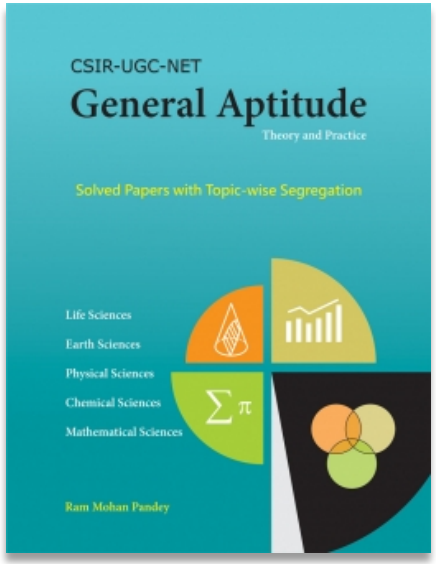

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Sl. No.79
QBID:1077054

Arrange the following animals on the basis of their phyla according to increasing level of complexity.

A. Limulus
B. Nereis
C. *Taenia solium*
D. Sycon

Choose the correct answer from the options given below :

(1) D, C, B, A
(2) C, D, A, B
(3) D, B, C, A
(4) C, D, B, A

Answer 1
Sycon – *Taenia solium* – Nereis – Limulus

Sl. No.80
QBID:1077055

Arrange the following evolutionary events in horse chronologically :

A. Equus
B. Miohippus
C. Orohippus
D. Hyacotherium
E. Merychippus

Choose the correct answer from the options given below :

(1) A, B, C, D, E
(2) D, C, B, E, A
(3) A, C, B, D, E
(4) D, B, C, E, A

Answer 2

Correct chronological order of the evolutionary events in horses is:

Hyacotherium → Orohippus → Miohippus → Merychippus → Equus

Sl. No.81
QBID:1077056

Given below are two statements :

Statement I :

Compound microscope includes condenser lens, the objective lens and the eye piece lens.

Statement II :

Objective lens has a smaller focal length and aperture than the eye piece.

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

(1) Both Statement I and Statement II are correct

(2) Both Statement I and Statement II are incorrect

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

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

Answer 1

Microscope made up of more than one glass lens in combination is termed **compound microscope**. Compound microscope includes the *condenser lens*, the *objective lens* and the *eyepiece lens*. The one facing the object is called the **objective** and the one close to the eye is called the **eyepiece**. The objective has a smaller aperture and smaller focal length than those of the eyepiece (also referred to as the **ocular**).

Sl. No.82
QBID:1077057

Given below are two statements :

Statement I :

Type I Hypersensitivity reaction is mediated by IgE.

Statement II :

Type III Hypersensitivity reaction is mediated by the formation of immune complexes and activation of complement.

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

(1) Both Statement I and Statement II are correct

(2) Both Statement I and Statement II are incorrect

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

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

Answer 1

Type I hypersensitivity: Ag induces cross-linking of IgE bound to mast cells and basophils with release of vasoactive mediators.

Type III hypersensitivity: Ag-Ab complexes deposited in various tissues induce complement activation.

Sl. No.83
QBID:1077058

Given below are two statements :

Statement I :
Flagella has 9 + 2 arrangement of microtubules.
Statement II :
Centriole has 9 + 0 arrangement of microtubules.
In the light of the above statements, choose the most appropriate answer from the options given below

(1) Both Statement I and Statement II are correct
(2) Both Statement I and Statement II are incorrect
(3) Statement I is correct but Statement II is incorrect
(4) Statement I is incorrect but Statement II is correct

Answer 1
Eukaryotic flagella (singular, *flagellum*) have a specialized arrangement of microtubules. A flagellum has two components–a **filament** and a **basal body** (or *kinetosome*). A *filament* possesses a bundle of microtubules, called the **axoneme**, in which nine outer doublet microtubules surround a central pair of singlet microtubules. This is termed as 9 + 2 arrangement. The walls of each centriole (and also basal body) are composed of nine triplet microtubules (9 + 0) arrangement.

Sl. No.84
QBID:1077059

Given below are two statements :

Statement I :

Lysozyme, an enzyme found in mucous secretion and in tears. It cleaves peptide bonds of the antigen.

Statement II :

Interferon comprises a group of proteins produced by virus-infected cells.

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

(1) Both Statement I and Statement II are correct
(2) Both Statement I and Statement II are incorrect
(3) Statement I is correct but Statement II is incorrect
(4) Statement I is incorrect but Statement II is correct

Answer 4

Lysozyme is an enzyme found in saliva, tears, and fluids of the respiratory tract that cleaves the peptidoglycan components of bacterial cell walls. *Interferons* (IFNs), a large family of cytokines, are produced by cells in response to viral infections, as well as other triggers such as bacterial and parasitic infections, tumors, and immune stimulants.

Sl. No.85
QBID:1077060

Given below are two statements :

Statement I :
In non-competitive type of enzymatic inhibition, the V_{max} decreases and k_m remains unchanged.

Statement II :
Temperature below freezing point causes inactivation of enzymes.

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

(1) Both Statement I and Statement II are correct
(2) Both Statement I and Statement II are incorrect
(3) Statement I is correct but Statement II is incorrect
(4) Statement I is incorrect but Statement II is correct

Answer 1

In case of non-competitive inhibition, 'apparent' V_{max} decreases and 'apparent' K_m remain same. The activity of enzymes is generally reduced at low temperatures, and this reduction is typically more pronounced below freezing point. At low temperatures, enzyme molecules have less kinetic energy and move more slowly, reducing the frequency of enzyme-substrate collisions and thus decreasing enzyme activity.

Sl. No.86
QBID:1077061

Given below are two statements :

Statement I :
Myoglobin and haemoglobin are oligomeric proteins.
Statement II :
Myoglobin and haemoglobin are heme-containing proteins.
In the light of the above statements, choose the most appropriate answer from the options given below

(1) Both Statement I and Statement II are correct
(2) Both Statement I and Statement II are incorrect
(3) Statement I is correct but Statement II is incorrect
(4) Statement I is incorrect but Statement II is correct

Answer 4

Myoglobin, a globular protein, contains a single polypeptide chain of 153 amino acid residues and a single heme group. *Hemoglobin* is an oligomeric, allosteric, conjugated protein with four polypeptide chains joined by non-covalent bonds. It also contains *heme* prosthetic group.

Sl. No.87
QBID:1077062

Given below are two statements :

Statement I :

Hypothalamus regulates emotions and behaviour.

Statement II :

Hypothalamus controls body temperature.

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

(1) Both Statement I and Statement II are correct

(2) Both Statement I and Statement II are incorrect

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

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

Answer 1

The hypothalamus helps to maintain a constant body temperature by regulating blood flow, sweating, and shivering. Also involved in regulating emotional responses such as fear, anger, and pleasure.

Sl. No.88
QBID:1077063

Match List I with List II

	List I		List II
A.	Savannah	I.	North American Plains
B.	Taiga	II.	Home of ants, antelopes and lions
C.	Temperate grassland	III.	Deciduous trees, such as hickory and birch
D.	Temperate broadleaf forest	IV.	Spruce, fir, pine and hemlock trees

Choose the correct answer from the options given below :

(1) A-II, B-IV, C-III, D-I
(2) A-II, B-IV, C-I, D-III
(3) A-IV, B-II, C-I, D-III
(4) A-IV, B-II, C-III, D-I

Answer 2

Sl. No.89
QBID:1077064

Given below are two statements :

Statement I :

Migration refers to regular, recurrent and cyclical movement of animals from one place to the other.

Statement II :

Migration occurs to manage the excess of food and water.

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

(1) Both Statement I and Statement II are correct

(2) Both Statement I and Statement II are incorrect

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

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

Answer 1 (In statement II, word *excess* should be replaced by *access*)
Migration in animals refers to the seasonal movement of animals from one region to another. This movement is often driven by changes in the environment, such as changes in temperature or the availability of food and water. Migration is a vital behavior for many species, allowing them to access resources and avoid harsh environmental conditions.

Sl. No.90
QBID:1077065

Choose the correct statement.

A. Differential gene expression can occur only at the level of transcription.
B. RNA polymerase binds to the promoter region to initiate transcription.
C. Enhancers regulate transcription.
D. Transcription factors can recognize specific sequences of DNA in heterochromatic region.
E. Post-translational modification occurs in nucleus.

Choose the correct answer from the options given below :

(1) A, D and E Only
(2) B and C Only
(3) B, C and D Only
(4) A, C and E Only

Answer 2

Sl. No.91
QBID:1077066

Pernicious anemia is a result of

A. Deficiency of Vitamin B_2
B. Deficiency of Vitamin C
C. Blockage of Vitamin B_{12} absorption
D. Blockage of Vitamin A absorption
E. Lack of proteins in diet

Choose the correct answer from the options given below :

(1) A, B, C and E Only
(2) C Only
(3) B, C and D Only
(4) D and E Only

Answer 2

Insufficient hemopoiesis resulting from an inability of the stomach to produce intrinsic factor, which is needed for absorption of vitamin B_{12} in the small intestine, causes **pernicious anemia**. Vitamin B12 is essential for normal RBC maturation.

Sl. No.92
QBID:1077067

Which of the following are correct for MNC-I molecule ?

A. Glycoprotein
B. Expressed by nearly all nucleated cells
C. Present antigen to T_H (T-helper) cells
D. Peptide-binding domain is $\alpha 1$ and $\beta 1$

Choose the correct answer from the options given below :

(1) A and B Only
(2) A, B and C Only
(3) B, C and D Only
(4) B and C Only

Answer 1 (In this question, word *MNC-I* should be replaced by *MHC-I*)
Class I MHC genes express glycoproteins called *class I MHC molecules*, on nearly all nucleated cells. Each class I MHC gene codes for a transmembrane glycoprotein, which is referred to as the α (or heavy chain).

Sl. No.93
QBID:1077068

The aminals having segmented body belong to the phylum

A. Protozoa
B. Cnidaria
C. Ctenophora
D. Annelida
E. Arthropoda

Choose the correct answer from the options given below :

(1) A, B and C Only
(2) C and D Only
(3) B and D Only
(4) D and E Only

Answer 4

Animals having segmented body include phylum Annelida (earthworms, leeches), phylum Arthropoda (insects, crustaceans, spiders), and phylum Chordata (vertebrates).

Sl. No.95
QBID:1077070

In deserts, Kangaroos can survive without drinking water because of the following reasons

A. Dependence on protein rich diet
B. Greater ADH level in the blood
C. Absence of sweat glands
D. Dependence on metabolic water

Choose the correct answer from the options given below :

(1) A Only
(2) C and D Only
(3) A, B, C and D
(4) A, B and D Only

Answer 3

Dependence on a protein-rich diet: Kangaroos have a unique digestive system that allows them to extract more water from their food than other mammals. They produce very dry feces and have a longer retention time in the gut to extract as much moisture as possible from their food. Their diet consists mainly of grasses and shrubs, which are rich in protein and minerals but have low water content.

Dependence on metabolic water: Kangaroos have the ability to produce water internally through metabolic processes. During the process of breaking down food, water is produced as a byproduct of metabolism. Kangaroos have a low metabolic rate, which helps them conserve water and produce metabolic water.

Greater ADH level in the blood: Kangaroos have a higher level of antidiuretic hormone (ADH) in their blood, which helps them retain water in their body. ADH reduces the amount of water lost through urine by promoting water reabsorption in the kidneys.

Absence of sweat glands: Kangaroos do not have sweat glands like other mammals. Sweating is an important mechanism to cool the body and conserve water in hot and dry environments. Kangaroos rely on other methods to dissipate heat, such as panting and seeking shade.

Sl. No.96
QBID:1077071

Which of the following statements are true ?

A. Dominant species have a large effect on the community because of its abundance.
B. Keystone species have a large role in community, out of proportion to its abundance.
C. Indicator species provide information on the overall health of an ecosystem.
D. Flagship species is the single, large and instantly recognisable species.

Choose the correct answer from the options given below :

(1) A and D Only
(2) A and B Only
(3) A, B and C Only
(4) A, B, C and D

Answer 4

Species which by their large number (or biomass) dominate the habitat and control the growth of other species of the community are called the **dominant species**. A **flagship species** is a species chosen to represent an environmental cause, such as an ecosystem in need of conservation. These species are chosen for their vulnerability, attractiveness or distinctiveness in order to generate support and acknowledgment from the public at large.

Sl. No.97
QBID:1077072

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

Assertion A :

Primitive groove is the functional equivalent to dorsal lip of the amphibian blastopore.

Reason R :

Dorsal lip of the amphibian blastopore is considered as the primary organiser.

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

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

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

(3) A is correct but R is not correct

(4) A is not correct but R is correct

Answer 3

The assertion is correct, but the reason is not accurate.

The dorsal lip of the amphibian blastopore is considered the primary organizer is that it secretes signaling molecules, such as BMP and Wnt, that regulate the fate and differentiation of cells in the developing embryo.

Sl. No.98
QBID:1077073

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

Assertion A :

The density of RNA molecule is higher than that of DNA.

Reason R :

RNA has 2'OH group attached to the second carbon atom of the ribose ring.

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

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

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

(3) A is correct but R is not correct

(4) A is not correct but R is correct

Answer 1

Sl. No.99
QBID:1077074

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

Assertion A :

Water is an excellent solvent.

Reason R :

Water has high dielectric constant.

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

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

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

(3) A is correct but R is not correct

(4) A is not correct but R is correct

Answer 1

Water acts as an excellent solvent. It dissolves more substances than any other liquid. 'Solubility' of a solute depends on the ability of a solvent to interact with a solute more strongly than solute particles interact with each other. Water has a very high value of **dielectric constant**, which is a measure of the capacity to neutralize the attraction between electrical charges. Because of this property also, water acts as a excellent solvent.

Sl. No.100
QBID:1077075

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

Assertion A :

Animals cannot convert fatty acids to sugars.

Reason R :

Plants possess glyoxylate cycle.

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

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

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

(3) A is correct but R is not correct

(4) A is not correct but R is correct

Answer 1

Organisms that lack the glyoxylate pathway cannot undertake the net synthesis of glucose from acetyl-CoA. This is the reason humans cannot convert fatty acids (which are catabolized to acetyl-CoA) to carbohydrates (that is, glucose). This process occurs in many bacteria, plants, protists and fungi, *but not animals*.

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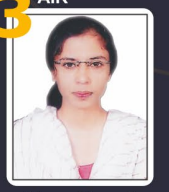

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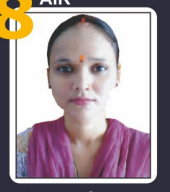

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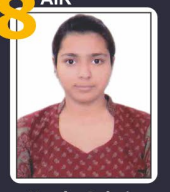

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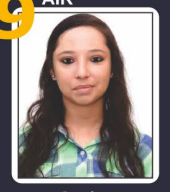

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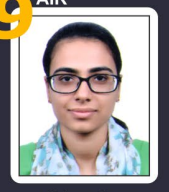

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