Tripura JEE 2024 Biology Set P Question Paper with Solutions

Time Allowed :45 Minutes	**Maximum Marks :**120	**Total questions :**30

General Instructions

Read the following instructions very carefully and strictly follow them:

1. The Tripura Joint Entrance Examination will be conducted in a single day as notified.
2. There will be three shifts: the first shift will consist of Physics and Chemistry question papers, and the subsequent two shifts will consist of Biology and Mathematics question papers.
3. The Board is conducting the examination through Optical Marks Recognition (OMR) system. The pattern of questions is Multiple Choice Question (MCQ) type.
4. The medium of the Question Paper shall be in English and Bengali.
5. There will be 30 (thirty) compulsory questions for each subject, taking 3 (three) questions from each Module.
6. Each question will carry 4 (four) marks, i.e., the total marks will be 120 (30×4) for each subject.

1. Where do you find 'Ball and Socket' joint in human body?

(A) Shoulder

(B) Knee

(C) Atlas

(D) Cranium

Correct Answer: (A) Shoulder

Solution: Step 1: Understand the types of joints.

The ball-and-socket joint is one of the most mobile types of joints. It consists of a spherical ball-like structure at the end of one bone fitting into a cup-like socket of another bone.

Step 2: Identify the location of a ball-and-socket joint.

The ball-and-socket joints are located in the shoulder and hip. They allow for rotational movement and movement in almost all directions.

Step 3: Analyze the options.

The shoulder joint is a ball-and-socket joint, where the ball-shaped head of the humerus fits into the socket of the scapula.

The knee joint is a hinge joint, not a ball-and-socket joint.

The atlas is part of the cervical vertebrae and doesn't form a ball-and-socket joint.

The cranium (skull) houses immovable joints called sutures, not a ball-and-socket joint.

Conclusion: The correct answer is (A) Shoulder.

Quick Tip

For ball-and-socket joints, remember that they are found in the shoulder and hip, providing the most movement of all joint types.

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2. If occipital lobe in cerebrum is damaged, which action is lost?

(A) Speech

(B) Hearing

(C) Vision

(D) Memory

Correct Answer: (C) Vision

Solution: Step 1: Identify the function of the occipital lobe.

The occipital lobe, located at the back of the brain, is primarily responsible for processing visual information.

Step 2: Understand the role of different lobes.

The frontal lobe is responsible for speech and decision-making.

The temporal lobe is responsible for hearing and memory.

The occipital lobe is specialized for vision.

Step 3: Analyze the options.

Speech is controlled by the frontal lobe, not the occipital lobe.

Hearing is controlled by the temporal lobe.

Memory is stored in the hippocampus, part of the temporal lobe.

Vision is directly linked to the occipital lobe, so damage here would result in vision loss.

Conclusion: If the occipital lobe is damaged, vision is lost, so the correct answer is (C) Vision.

Quick Tip

When studying brain functions, remember that each lobe has specialized roles, with the occipital lobe handling vision.

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3. Which hormone promotes glycogenolysis and gluconeogenesis?

(A) Insulin

(B) Aldosterone

(C) Glucagon

(D) ACTH

Correct Answer: (C) Glucagon

Solution:

Step 1: Understanding glycogenolysis and gluconeogenesis.

Glycogenolysis is the process of breaking down glycogen into glucose, while gluconeogenesis is the formation of glucose from non-carbohydrate precursors. These processes are crucial in maintaining blood glucose levels, especially during fasting or stress.

Step 2: Role of Glucagon.

Glucagon is a hormone produced by the alpha cells of the pancreas. It promotes glycogenolysis and gluconeogenesis in the liver. When blood glucose levels drop, glucagon is released to stimulate these processes, thereby raising blood glucose levels.

Step 3: Comparing other options.

Insulin: Insulin works oppositely to glucagon. It promotes glycogenesis (the formation of glycogen from glucose) and lowers blood glucose levels.

Aldosterone: Aldosterone is a hormone involved in regulating sodium and water balance, not glucose metabolism.

ACTH (Adrenocorticotropic hormone): ACTH stimulates cortisol release from the adrenal glands but does not directly promote glycogenolysis or gluconeogenesis.

Thus, the correct answer is **(C) Glucagon.**

Quick Tip

Remember that glucagon raises blood glucose levels by promoting glycogen breakdown (glycogenolysis) and glucose production (gluconeogenesis), while insulin lowers blood glucose levels by promoting glucose storage (glycogenesis).

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4. Which of the following is not the function of the liver?

(A) Detoxification

(B) Bile secretion

(C) Glycogen storage

(D) Insulin production

Correct Answer: (D) Insulin production

Solution:

Step 1: Understanding liver functions.

The liver is a vital organ responsible for several key functions in the body:

Detoxification: The liver helps detoxify harmful substances, including drugs, alcohol, and metabolic waste products.

Bile secretion: The liver produces bile, which is important for the digestion and absorption

of fats in the small intestine.

Glycogen storage: The liver stores glucose as glycogen and can release it when blood glucose levels drop.

Step 2: Understanding insulin production.

Insulin is produced by the pancreas, not the liver. The pancreas has specialized cells known as beta cells that secrete insulin to regulate blood sugar levels. The liver responds to insulin by storing glucose as glycogen, but it does not produce insulin itself.

Step 3: Conclusion.

Since insulin production is the responsibility of the pancreas and not the liver, the correct answer is **(D) Insulin production.**

Quick Tip

The liver performs essential metabolic functions such as detoxification, bile secretion, and glycogen storage, but it does not produce insulin. Insulin production is the primary function of the pancreas.

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5. Stomata of which plants are opened at night?

(A) C3 plants

(B) C4 plants

(C) CAM plants

(D) Hydrolytic plants

Correct Answer: (C) CAM plants

Solution: Step 1: Understand the stomatal function in plants.

In most plants, stomata are open during the day for photosynthesis and closed at night. However, in CAM (Crassulacean Acid Metabolism) plants, the stomata are opened at night to reduce water loss and allow for carbon dioxide to be absorbed.

Step 2: Identify the plant types.

C3 and C4 plants typically open their stomata during the day.

CAM plants open their stomata at night to minimize water loss.

Hydrolytic plants do not have this characteristic.

Conclusion: The correct answer is (C) CAM plants.

Quick Tip

CAM plants are adapted to dry climates and have a unique photosynthetic process where they open their stomata at night to conserve water.

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6. Which part of nephron is responsible for active reabsorption of sodium?

(A) Proximal convoluted tubule

(B) Renal capsule

(C) Collecting duct

(D) Descending arm of Henle's loop

Correct Answer: (A) Proximal convoluted tubule

Solution: Step 1: Understand nephron function.

The nephron is the functional unit of the kidney, responsible for filtering blood and producing urine.

Step 2: Identify the site of sodium reabsorption.

The proximal convoluted tubule is the site where the majority of sodium reabsorption occurs, via active transport mechanisms.

The renal capsule is responsible for filtering blood but not for reabsorption.

The collecting duct and the descending arm of Henle's loop play roles in water reabsorption but are not the primary sites for active sodium reabsorption.

Conclusion: The correct answer is (A) Proximal convoluted tubule.

Quick Tip

The proximal convoluted tubule reabsorbs a large portion of sodium through active transport, playing a key role in kidney function.

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7. Which of the following is associated with Barr body?

(A) Autosome

(B) X chromosome

(C) Y chromosome

(D) Only male body

Correct Answer: (B) X chromosome

Solution: Step 1: Understand Barr body formation.

A Barr body is an inactivated X chromosome in female mammals, which occurs to balance the gene dosage between males and females.

Step 2: Analyze the options.

The Barr body is associated with the X chromosome and is found in females to prevent double expression of X-linked genes.

Autosomes are non-sex chromosomes and are not involved in Barr body formation.

The Y chromosome does not form a Barr body.

Males do not have Barr bodies because they have only one X chromosome.

Conclusion: The correct answer is (B) X chromosome.

Quick Tip

Barr bodies are only present in females and represent inactivated X chromosomes that help equalize gene expression between the sexes.

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8. Which of the following has more similarity with modern man?

(A) Australopithecus

(B) Cro-Magnons

(C) Neanderthals

(D) Homo erectus

Correct Answer: (B) Cro-Magnons

Solution:

Step 1: Understanding Cro-Magnons.

Cro-Magnons are considered the closest relatives to modern humans. They lived around 40,000 years ago and are thought to have shared much of the same physical traits, such as a larger brain, advanced tool-making skills, and symbolic thinking.

Step 2: Comparing other options.

Australopithecus: These early hominids, like ”Lucy,” were much older and had more primitive features compared to modern humans.

Neanderthals: Neanderthals were similar to modern humans but had a more robust build and distinct cranial features.

Homo erectus: While Homo erectus was an important ancestor, it was not as closely related to modern humans as Cro-Magnons.

Thus, the correct answer is **(B) Cro-Magnons.**

Quick Tip

When studying human evolution, focus on Cro-Magnons as they are considered the most similar to modern humans in terms of physical and cultural traits.

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9. Which of the following pairs is correct?

(A) AIDS - Bacillus

(B) Syphilis - Treponema Pallidum

(C) Malaria - Trypanosoma

(D) Gonorrhoea - Virus

Correct Answer: (B) Syphilis - Treponema Pallidum

Solution:

Step 1: Correct identification of disease and pathogen.

Syphilis is caused by the bacterium Treponema pallidum. Therefore, option (B) is correct.

Step 2: Review of other options.

AIDS is caused by HIV, not a Bacillus.

Malaria is caused by Plasmodium, not Trypanosoma (which causes sleeping sickness).

Gonorrhoea is caused by the bacterium Neisseria gonorrhoeae, not a virus.

Thus, the correct answer is **(B) Syphilis - Treponema Pallidum.**

Quick Tip

When studying infectious diseases, focus on the specific pathogens associated with each disease. For example, Treponema pallidum causes syphilis, while HIV causes AIDS.

10. Which is the common term for cancer of epithelial cells?

(A) Leukemia

(B) Sarcoma

(C) Emphysema

(D) Carcinoma

Correct Answer: (D) Carcinoma

Solution:

Step 1: Understanding carcinoma.

Carcinoma refers to cancer that originates in epithelial cells, which line the body's organs and structures. This is the most common type of cancer.

Step 2: Review of other options.

Leukemia: This is a type of cancer that affects blood cells, not epithelial cells.

Sarcoma: This cancer affects connective tissues, such as bones, muscles, and cartilage.

Emphysema: This is a lung condition, not a form of cancer.

Thus, the correct answer is **(D) Carcinoma.**

Quick Tip

Remember that carcinoma affects epithelial cells, sarcoma affects connective tissues, and leukemia affects blood cells.

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11. Which of the following is used for bread-making?

(A) S. cerevisiae

(B) Aspergillus

(C) Streptobacillus

(D) S. octosporus

Correct Answer: (A) S. cerevisiae

Solution: Step 1: Identify the yeast used in bread-making.

S. cerevisiae, commonly known as baker's yeast, is used in bread-making as it ferments sugars to produce carbon dioxide, causing the bread to rise.

Step 2: Analyze the options.

Aspergillus is a genus of molds, not used for bread-making.

Streptobacillus is a genus of bacteria, not used in baking.

S. octosporus is not a yeast species used in bread-making.

Conclusion: The correct answer is (A) S. cerevisiae.

Quick Tip

S. cerevisiae, or baker's yeast, is crucial for fermentation in bread-making, producing gas that helps the dough rise.

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12. What is yogurt?

(A) Fermentation product

(B) Pasteurized product

(C) Dehydrated product

(D) Distillation product

Correct Answer: (A) Fermentation product

Solution: Step 1: Understand yogurt production.

Yogurt is produced through the fermentation of milk by bacteria such as Lactobacillus bulgaricus and Streptococcus thermophilus.

Step 2: Analyze the options.

Yogurt is a product of fermentation where bacteria convert lactose into lactic acid, which gives yogurt its texture and sour taste.

Pasteurized products are heated to kill bacteria, but yogurt is fermented.

Yogurt is not a dehydrated or distillation product.

Conclusion: The correct answer is (A) Fermentation product.

Quick Tip

Yogurt is a result of bacterial fermentation of milk, not pasteurization, dehydration, or distillation.

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13. What are the most important livestocks in India?

(A) Elephants and cattles

(B) Cattles and buffaloes

(C) Cattles and dogs

(D) Dogs and cats

Correct Answer: (B) Cattles and buffaloes

Solution: Step 1: Identify the most important livestock in India. Cattle and buffaloes are considered the most important livestock in India, used for milk, meat, and agricultural purposes.

Step 2: Analyze the options. - Elephants, though culturally important, are not primarily used for milk or agricultural purposes. - Dogs and cats are pets, not considered important livestock. - Cattle and buffaloes are essential for agriculture, dairy, and meat production in India.

Conclusion: The correct answer is (B) Cattles and buffaloes.

Quick Tip

In India, cattle and buffaloes are vital for agriculture and dairy farming, making them the most important livestock.

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14. Which of the following is not an antibiotic?

(A) Streptomycin

(B) Chloromycin

(C) Penicillin

(D) Aflatoxin

Correct Answer: (D) Aflatoxin

Solution: Step 1: Identify the substances.

Antibiotics are substances used to kill or inhibit the growth of bacteria. Streptomycin, chloromycin, and penicillin are antibiotics.

Step 2: Analyze the options.

Aflatoxin is a toxin produced by fungi, not an antibiotic.

Streptomycin, chloromycin, and penicillin are all used to treat bacterial infections.

Conclusion: The correct answer is (D) Aflatoxin.

Quick Tip

Aflatoxins are toxic and carcinogenic compounds produced by fungi, unlike antibiotics which target bacteria.

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15. Which of the following DNA is made from RNA?

(A) A-DNA

(B) B-DNA

(C) C-DNA

(D) Z-DNA

Correct Answer: (B) B-DNA

Solution: Step 1: Understand DNA forms.

B-DNA is the most common form of DNA and can be synthesized from RNA in processes such as reverse transcription.

Step 2: Analyze the options.

A-DNA, C-DNA, and Z-DNA are different structural forms of DNA but are not directly made from RNA.

B-DNA is the form that is most commonly synthesized from RNA during reverse transcription in certain organisms.

Conclusion: The correct answer is (B) B-DNA.

Quick Tip

Reverse transcription is a process where RNA is used as a template to synthesize complementary DNA, typically leading to the formation of B-DNA.

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16. Who first proposed the term 'biodiversity'?

(A) Hooker

(B) Candolle

(C) Radford

(D) W. G. Rosen

Correct Answer: (D) W. G. Rosen

Solution: Step 1: Understand the origin of the term 'biodiversity.'

The term "biodiversity" was first proposed by W.G. Rosen in 1985 to describe the variety of life on Earth.

Step 2: Analyze the options.

Hooker, Candolle, and Radford were prominent biologists, but none of them coined the term "biodiversity."

W.G. Rosen was the one who first used the term in the context of ecosystems and conservation.

Conclusion: The correct answer is (D) W. G. Rosen.

Quick Tip

The term 'biodiversity' refers to the variety of life at different levels, from genes to ecosystems, and was first introduced by W.G. Rosen.

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17. The genetic material of influenza is

(A) Double stranded DNA

(B) Single stranded DNA

(C) Single stranded RNA

(D) Double stranded RNA

Correct Answer: (C) Single stranded RNA

Solution:

Step 1: Identify the virus type.

Influenza is caused by the influenza virus, which is an RNA virus. Viruses can either have DNA or RNA as their genetic material.

Step 2: Review of influenza's genetic material.

Influenza specifically contains single-stranded RNA (ssRNA) as its genetic material. This single-stranded RNA is used by the virus for replication and to produce new viral proteins.

Step 3: Rule out other options.

Double stranded DNA: This is characteristic of many other viruses, but not influenza.

Single stranded DNA: Influenza does not have DNA, it has RNA.

Double stranded RNA: Some viruses have double-stranded RNA, but influenza has single-stranded RNA.

Thus, the correct answer is **(C) Single stranded RNA.**

Quick Tip

Remember that influenza virus has RNA as its genetic material, specifically single-stranded RNA.

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18. Which one of the following is the first stable compound in Krebs cycle?

(A) Citric acid

(B) Fumaric acid

(C) Acetyl-CoA

(D) Oxaloacetic acid

Correct Answer: (A) Citric acid

Solution:

Step 1: Understand the Krebs cycle.

The Krebs cycle is a part of cellular respiration that takes place in the mitochondria. It begins with the combination of Acetyl-CoA and oxaloacetate to form citric acid (also called citrate).

Step 2: Reaction formation.

The reaction begins with the combination of Acetyl-CoA (derived from glucose or fats) with oxaloacetate to form citric acid. This is the first stable compound formed in the cycle.

Step 3: Review of other options.

Fumaric acid: Fumaric acid is produced later in the Krebs cycle, but not as the first stable compound.

Acetyl-CoA: This is a substrate that enters the cycle but is not the first stable compound.

Oxaloacetic acid: This is the molecule that combines with Acetyl-CoA to form citric acid, but it is not the first stable product.

Thus, the correct answer is **(A) Citric acid.**

Quick Tip

Citric acid (citrate) is the first stable compound produced in the Krebs cycle, formed by the combination of Acetyl-CoA and oxaloacetate.

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19. Which one of the following is a non-protein enzyme?

(A) Amylase

(B) Isomerase

(C) Ribozymes

(D) Lipase

Correct Answer: (C) Ribozymes

Solution:

Step 1: Understanding ribozymes.

Ribozymes are RNA molecules that have catalytic properties, meaning they can catalyze biochemical reactions, just like protein enzymes. They do not require proteins to function.

Step 2: Review of other enzymes.

Amylase: This is a protein enzyme that helps break down starches into sugars.

Isomerase: This is also a protein enzyme that catalyzes the conversion of a molecule into its isomer.

Lipase: This is a protein enzyme that catalyzes the breakdown of fats into fatty acids and glycerol.

Thus, the correct answer is **(C) Ribozymes.**

Quick Tip

Ribozymes are non-protein enzymes made of RNA. They are capable of catalyzing chemical reactions, similar to protein enzymes.

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20. Which of the following cells is round and biconcave?

(A) Neutrophil

(B) Osteocyte

(C) Erythrocyte

(D) Astrocyte

Correct Answer: (C) Erythrocyte

Solution:

Step 1: Identify the characteristics of erythrocytes.

Erythrocytes, or red blood cells, are round and biconcave in shape. This biconcave shape allows them to have a large surface area for gas exchange (such as oxygen and carbon dioxide) and to pass through the small capillaries.

Step 2: Review of other cells.

Neutrophils: These are a type of white blood cell, and although they are round, they do not have a biconcave shape.

Osteocytes: These are bone cells that have a star-like shape, not a biconcave one.

Astrocytes: These are star-shaped glial cells in the brain and nervous system.

Thus, the correct answer is **(C) Erythrocyte.**

Quick Tip

Erythrocytes are uniquely round and biconcave, allowing for efficient oxygen transport and flexibility in blood circulation.

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21. Which one is the origin of lysosome?

(A) Chloroplast

(B) Mitochondria

(C) Golgi body

(D) Ribosome

Correct Answer: (C) Golgi body

Solution: Step 1: Understand the origin of lysosomes.

Lysosomes are membrane-bound organelles in the cell that contain digestive enzymes, which help in breaking down excess or worn-out cell parts, and foreign substances.

Step 2: Identify the cellular organelles involved.

The Golgi body (also known as the Golgi apparatus) is responsible for processing and

packaging proteins and lipids. It also forms lysosomes by packaging enzymes into vesicles.

Chloroplasts are involved in photosynthesis and do not form lysosomes.

Mitochondria are the energy powerhouses of the cell, not involved in lysosome formation.

Ribosomes are responsible for protein synthesis, not for the formation of lysosomes.

Step 3: Conclusion.

Lysosomes are formed in the Golgi body, making it the correct answer.

Conclusion: The correct answer is (C) Golgi body.

Quick Tip

Lysosomes are formed by the Golgi apparatus, which packages digestive enzymes into vesicles for cellular digestion.

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22. 'Oral contraceptive pills' help in birth control by

(A) killing sperms

(B) killing ova

(C) preventing ovulation

(D) forming barrier between sperm and ovum

Correct Answer: (C) preventing ovulation

Solution: Step 1: Understand the mechanism of oral contraceptive pills.

Oral contraceptive pills primarily function by releasing hormones (such as estrogen and progestin) that prevent the release of an egg from the ovaries. This is known as preventing ovulation.

Step 2: Analyze the options.

Oral contraceptive pills do not kill sperms or ova directly.

They do not form a physical barrier between the sperm and egg; that's the function of barrier methods like condoms.

The key mechanism is preventing ovulation, so that no egg is available for fertilization.

Step 3: Conclusion.

Oral contraceptive pills prevent ovulation, making option (C) the correct answer.

Conclusion: The correct answer is (C) preventing ovulation.

Quick Tip

Oral contraceptives work by preventing the release of eggs, thus preventing fertilization.

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23. What is the function of manganese in plants?

(A) Formation of cell wall

(B) Synthesis of nucleic acid

(C) Synthesis of chlorophyll

(D) Photolysis during photosynthesis

Correct Answer: (D) Photolysis during photosynthesis

Solution: Step 1: Understand the role of manganese in plants.

Manganese is an essential micronutrient in plants, and it plays a crucial role in the process of photolysis, which is the splitting of water molecules during photosynthesis.

Step 2: Analyze the options.

Manganese is not directly involved in the formation of the cell wall.

It does not play a direct role in nucleic acid synthesis.

While it is important for chlorophyll function, its primary role is in photolysis, where it helps in the splitting of water molecules in photosystem II.

Step 3: Conclusion.

The correct answer is (D) photolysis during photosynthesis, as manganese is vital in this process.

Conclusion: The correct answer is (D) Photolysis during photosynthesis.

Quick Tip

Manganese is important for photolysis during photosynthesis, where it aids in water splitting to release oxygen.

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24. Which of the following is believed to be the cause of dyslexia?

(A) Mercury

(B) Cadmium

(C) Lead

(D) Manganese

Correct Answer: (C) Lead

Solution: Step 1: Understand dyslexia and its causes.

Dyslexia is a learning disorder that primarily affects reading and writing skills.

Environmental toxins such as lead have been implicated in causing neurological damage that may contribute to learning disabilities like dyslexia.

Step 2: Analyze the options.

Mercury, cadmium, and manganese are toxic metals, but lead is most commonly associated with neurological damage and developmental disorders, including dyslexia.

Lead exposure, particularly in early childhood, is a known risk factor for learning disabilities.

Step 3: Conclusion.

The correct answer is (C) Lead, which is a significant cause of dyslexia.

Conclusion: The correct answer is (C) Lead.

Quick Tip

Lead poisoning, especially in children, is associated with developmental and learning disorders, including dyslexia.

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25. Which of the following is an example of Gene bank?

(A) Ex-situ conservation

(B) In-situ conservation

(C) Sanctuary

(D) Hotspot

Correct Answer: (A) Ex-situ conservation

Solution:

Step 1: Understand Gene banks.

Gene banks are facilities where genetic material of plants, animals, or microorganisms is stored for future use. These facilities store DNA, seeds, sperm, and other genetic material.

Step 2: Understanding Ex-situ conservation.

Ex-situ conservation involves preserving species outside of their natural habitat. Gene banks, where genetic material is stored for later use or research, are an example of ex-situ conservation.

Step 3: Review of other options.

In-situ conservation: This refers to the conservation of species in their natural habitat, such as national parks or wildlife sanctuaries.

Sanctuary: A sanctuary is a protected area where wildlife is preserved, but it's part of in-situ conservation.

Hotspot: A biodiversity hotspot is an area that is rich in species but is threatened by human activities, but not a gene bank.

Thus, the correct answer is **(A) Ex-situ conservation.**

Quick Tip

Ex-situ conservation includes gene banks, botanical gardens, and zoos, while in-situ conservation occurs in natural habitats like wildlife sanctuaries.

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26. Fungal part of lichen is called

(A) Phycobiont

(B) Mycobiont

(C) Mycoparasite

(D) None of these

Correct Answer: (B) Mycobiont

Solution:

Step 1: Understanding lichen structure.

Lichens are a mutualistic symbiotic relationship between fungi and photosynthetic organisms (usually algae or cyanobacteria). The fungal part is called the "mycobiont," and the photosynthetic partner is called the "phycobiont."

Step 2: Identifying other terms.

Phycobiont: This refers to the photosynthetic partner in a lichen, not the fungal part.

Mycoparasite: A mycoparasite is a fungus that parasitizes another fungus, not part of lichen.

None of these: This is incorrect, as "mycobiont" is the correct term.

Thus, the correct answer is **(B) Mycobiont.**

Quick Tip

Lichens consist of two main components: the mycobiont (fungal partner) and the phycobiont (photosynthetic partner).

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27. Which of the following restriction enzymes produces blunt ends?

(A) HindIII

(B) SalI

(C) EcoRV

(D) XhoI

Correct Answer: (C) EcoRV

Solution:

Step 1: Understanding blunt ends.

Blunt ends are formed when both strands of the DNA are cut at the same position, without any overhang. Some restriction enzymes cut DNA to produce blunt ends.

Step 2: Identifying EcoRV.

EcoRV is a restriction enzyme that cuts DNA to produce blunt ends. It cleaves the DNA at specific recognition sites without leaving overhanging bases.

Step 3: Reviewing other options.

HindIII: This enzyme cuts to produce sticky ends with overhangs.

SalI: This enzyme also creates sticky ends, not blunt ends.

XhoI: This is another enzyme that creates sticky ends.

Thus, the correct answer is **(C) EcoRV.**

Quick Tip

Restriction enzymes that cut DNA without leaving overhangs (blunt ends) are useful for certain cloning applications.

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28. DNA fragments are

(A) Negatively charged

(B) Neutral

(C) Positively charged

(D) Either positively or negatively charged depending on size

Correct Answer: (A) Negatively charged

Solution:

Step 1: Understanding the charge of DNA.

DNA molecules carry a negative charge due to the phosphate groups present in the backbone of the DNA. This negative charge is crucial for many of the processes in molecular biology, such as gel electrophoresis, where DNA moves towards the positive electrode.

Step 2: Reviewing other options.

Neutral: DNA is not neutral; it is negatively charged due to the phosphate group.

Positively charged: DNA is not positively charged.

Either positively or negatively charged depending on size: DNA is always negatively charged, irrespective of its size.

Thus, the correct answer is **(A) Negatively charged.**

Quick Tip

DNA is always negatively charged because of the phosphate groups in its backbone, which makes it move toward the positive electrode in electrophoresis.

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29. Which of the following is a protein deficiency disease?

(A) Eczema

(B) Cirrhosis

(C) Kwashiorkor

(D) Uremia

Correct Answer: (C) Kwashiorkor

Solution: Step 1: Understand the nature of Kwashiorkor.

Kwashiorkor is a severe protein deficiency disease often seen in children. It is characterized by edema, irritability, an enlarged liver, and stunted growth.

Step 2: Analyze the options.

Eczema is a skin condition caused by inflammation, not protein deficiency.

Cirrhosis is a liver disease, typically caused by chronic alcohol use or viral infections, not by protein deficiency.

Uremia is a condition related to kidney failure, not a result of protein deficiency.

Step 3: Conclusion.

Kwashiorkor is the only disease listed here that is caused by protein deficiency.

Conclusion: The correct answer is (C) Kwashiorkor.

Quick Tip

Kwashiorkor is a result of severe protein malnutrition, often marked by swelling in the abdomen and limbs.

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30. When was WHO established in Switzerland?

(A) 7th April, 1947

(B) 7th April, 1948

(C) 10th April, 1949

(D) 8th April, 1950

Correct Answer: (B) 7th April, 1948

Solution: Step 1: Understand the history of WHO.

The World Health Organization (WHO) was established on 7th April 1948 as the United Nations specialized agency for health, headquartered in Geneva, Switzerland.

Step 2: Analyze the options.

The WHO was established on 7th April, 1948, which corresponds to option (B).

The other dates are incorrect.

Step 3: Conclusion.

The WHO was established on 7th April, 1948, making option (B) the correct answer.

Conclusion: The correct answer is (B) 7th April, 1948.

Quick Tip

The World Health Organization was founded in 1948 and has played a crucial role in global health governance since its establishment.
