Rajasthan JET Biology Sample Paper-4

Duration: 40 Minutes **Maximum Marks: 160**

Instructions

- This paper contains **40** Multiple Choice Questions (Single Correct).
- Each correct answer carries **+4 marks**.
- Each incorrect answer carries: **−1 marks**.
- Use of mobile phones, smartwatches, calculators, or any electronic gadgets is strictly prohibited.

Q1. Which of the following is the correct sequence of layers in the transverse section of a dicot stem from outside to inside?

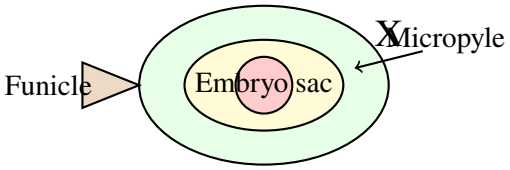
(A) Epidermis, Hypodermis, Cortex, Endodermis, Pericycle, Vascular bundle, Pith

(B) Epidermis, Cortex, Endodermis, Pericycle, Hypodermis, Vascular bundle, Pith

(C) Epidermis, Hypodermis, Endodermis, Cortex, Pericycle, Vascular bundle, Pith

(D) Epidermis, Hypodermis, Cortex, Pericycle, Endodermis, Vascular bundle, Pith

Q2. The diagram shows the structure of a typical anatropous ovule. Identify the structure marked as 'X':



(A) Chalaza

(B) Integument

(C) Nucellus

(D) Micropyle

Q3. In the Calvin cycle, the first stable product formed after CO_2 fixation is:

(A) Oxaloacetate

(B) 3-Phosphoglycerate

(C) Phosphoenolpyruvate

(D) Ribulose-5-phosphate

Q4. Which of the following is NOT a characteristic feature of monocot stem?

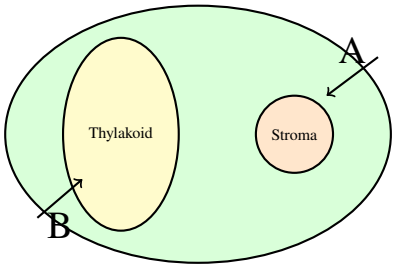
(A) Scattered vascular bundles

(B) Presence of bundle sheath

(C) Presence of endodermis

(D) Presence of cambium

Q5. The diagram below represents the structure of a chloroplast. Which part is the site of the Calvin cycle?



(A) A

(B) B

(C) Both A and B

(D) Neither A nor B

Q6. The phenomenon of linkage was first discovered by:

(A) Mendel

(B) Morgan

(C) Bateson and Punnett

(D) Sutton and Boveri

Q7. Which enzyme is responsible for the formation of peptide bonds during translation?

(A) RNA polymerase

(B) Peptidyl transferase

(C) DNA ligase

(D) Ribonuclease

Q8. In angiosperms, double fertilization was discovered by:

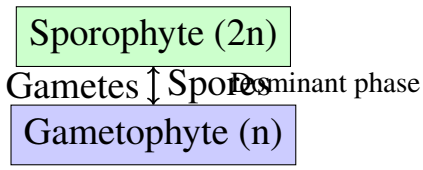
(A) Strasburger

(B) Nawaschin

(C) Hofmeister

(D) Maheshwari

Q9. The diagram shows the life cycle of a fern. Identify the dominant phase:



(A) Sporophyte

(B) Gametophyte

(C) Both equally dominant

(D) Neither

Q10. Which of the following is an example of a xerophytic adaptation in plants?

(A) Presence of aerenchyma

(B) Sunken stomata

(C) Presence of pneumatophores

(D) Broad leaves

Q11. The enzyme that catalyzes the conversion of glucose-6-phosphate to fructose-6-phosphate is:

(A) Hexokinase

(B) Phosphoglucose isomerase

(C) Phosphofructokinase

(D) Aldolase

Q12. Which of the following is a correct example of commensalism?

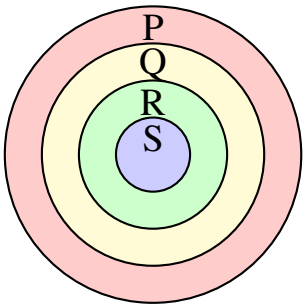
(A) Lichen

(B) Cuscuta on host plant

(C) Epiphyte on tree

(D) Rhizobium in root nodules

Q13. The diagram represents the structure of a typical flower. Identify the whorl marked 'P':



(A) Calyx

(B) Corolla

(C) Androecium

(D) Gynoecium

Q14. Which of the following is the correct order of taxonomic hierarchy?

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

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

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

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

Q15. In C4 plants, the initial CO_2 acceptor is:

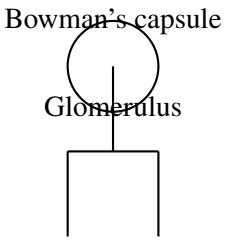
(A) RuBP

(B) PEP

(C) PGA

(D) OAA

Q16. The diagram shows the structure of a nephron. Identify the part where ultrafiltration occurs:



(A) Proximal convoluted tubule

(B) Glomerulus

(C) Loop of Henle

(D) Distal convoluted tubule

Q17. Which of the following is a secondary pollutant?

(A) CO

(B) SO_2

(C) PAN

(D) NO_2

Q18. The process of formation of mRNA from DNA is called:

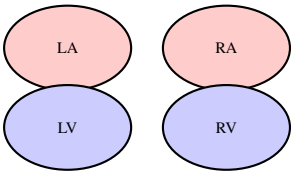
(A) Transcription

(B) Translation

(C) Replication

(D) Transduction

Q19. In the diagram of the human heart, which chamber receives oxygenated blood from the lungs?



(A) Right atrium

(B) Left atrium

(C) Right ventricle

(D) Left ventricle

Q20. Which of the following is the correct sequence of events in the nitrogen cycle?

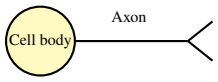
(A) Nitrogen fixation → Nitrification → Ammonification → Denitrification

(B) Ammonification → Nitrification → Nitrogen fixation → Denitrification

(C) Nitrification → Nitrogen fixation → Ammonification → Denitrification

(D) Denitrification → Nitrogen fixation → Ammonification → Nitrification

Q21. The diagram shows the structure of a typical neuron. Identify the part that conducts impulses away from the cell body:



(A) Dendrite

(B) Axon

(C) Myelin sheath

(D) Synaptic knob

Q22. Which of the following is a correct example of a symbiotic relationship?

(A) Mycorrhiza

(B) Parasitism

(C) Predation

(D) Competition

Q23. The enzyme that unwinds the DNA double helix during replication is:

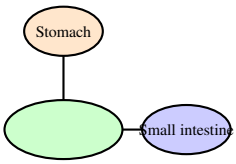
(A) DNA polymerase

(B) Helicase

(C) Ligase

(D) Primase

Q24. In the diagram of the human digestive system, which part is the main site of protein digestion?



(A) Mouth

(B) Stomach

(C) Small intestine

(D) Large intestine

Q25. Which of the following is a characteristic of a prokaryotic cell?

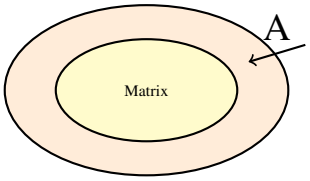
(A) Presence of nuclear membrane

(B) Presence of 80S ribosomes

(C) Absence of membrane-bound organelles

(D) Presence of mitochondria

Q26. The diagram shows the structure of a typical mitochondrion. Identify the part where the Krebs cycle occurs:



(A) Outer membrane

(B) Inner membrane

(C) Matrix

(D) Intermembrane space

Q27. Which of the following is the primary function of the Golgi apparatus?

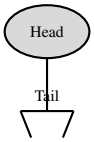
(A) Protein synthesis

(B) Lipid synthesis

(C) Packaging and secretion of proteins

(D) Energy production

Q28. The diagram shows the structure of a typical bacteriophage. Identify the part that contains the genetic material:



(A) Head

(B) Tail sheath

(C) Tail fibers

(D) Base plate

Q29. Which of the following is a correct example of a parasitic plant?

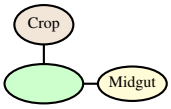
(A) Cuscuta

(B) Orchid

(C) Lichen

(D) Rhizobium

Q30. The diagram shows the structure of a typical insect. Identify the part that is the main site of digestion:



(A) Crop

(B) Gizzard

(C) Midgut

(D) Hindgut

Q31. Which of the following is the correct sequence of stages in the life cycle of a mosquito?

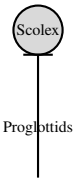
(A) Egg → Larva → Pupa → Adult

(B) Egg → Pupa → Larva → Adult

(C) Larva → Egg → Pupa → Adult

(D) Pupa → Larva → Egg → Adult

Q32. The diagram shows the structure of a typical tapeworm. Identify the part that is the site of attachment to the host intestine:



(A) Scolex

(B) Neck

(C) Proglottids

(D) Strobila

Q33. Which of the following is a correct example of a biological control agent?

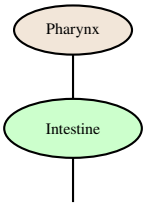
(A) Bacillus thuringiensis

(B) DDT

(C) Malathion

(D) Carbaryl

Q34. The diagram shows the structure of a typical earthworm. Identify the part that is the main site of absorption:



(A) Pharynx

(B) Crop

(C) Gizzard

(D) Intestine

Q35. Which of the following is the correct sequence of events in the process of photosynthesis?

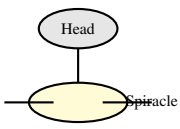
(A) Light reaction → Calvin cycle

(B) Calvin cycle → Light reaction

(C) Krebs cycle → Light reaction

(D) Glycolysis → Calvin cycle

Q36. The diagram shows the structure of a typical cockroach. Identify the part that is the main site of respiration:



(A) Trachea

(B) Spiracle

(C) Malpighian tubule

(D) Crop

Q37. Which of the following is a correct example of a vector-borne disease?

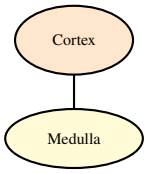
(A) Malaria

(B) Tuberculosis

(C) Cholera

(D) Typhoid

Q38. The diagram shows the structure of a typical human kidney. Identify the part that is the functional unit:



(A) Cortex

(B) Medulla

(C) Nephron

(D) Pelvis

Q39. Which of the following is the correct sequence of events in the process of digestion in humans?

(A) Mouth → Stomach → Small intestine → Large intestine

(B) Stomach → Mouth → Small intestine → Large intestine

(C) Small intestine → Mouth → Stomach → Large intestine

(D) Large intestine → Small intestine → Stomach → Mouth

Q40. Which of the following organelles is present in plant cells but completely absent in typical animal cells?

(A) Mitochondrion

(B) Golgi apparatus

(C) Plastids (chloroplasts, chromoplasts, leucoplasts) and a large central vacuole

(D) Ribosome

Detailed Solutions

Q1.

Solution

Concept:

The transverse section of a dicot stem shows a distinct arrangement of tissues from the periphery towards the center. This arrangement is important for understanding the structural and functional organization of the stem.

Solution:

(a) The outermost layer is the epidermis, which provides protection.

(b) Just beneath the epidermis is the hypodermis, which is made up of collenchyma and provides mechanical support.

(c) The cortex is the next layer, consisting of parenchyma cells that store food.

(d) The endodermis is the innermost layer of the cortex.

(e) The pericycle lies just outside the vascular bundles.

(f) Vascular bundles are arranged in a ring and contain xylem and phloem.

(g) The pith occupies the central region and stores food.

(h) Therefore, the correct sequence from outside to inside is Epidermis, Hypodermis, Cortex, Endodermis, Pericycle, Vascular bundle, Pith.

Final Answer: Epidermis, Hypodermis, Cortex, Endodermis, Pericycle, Vascular bundle, Pith

Answer: (A)

Go Back to Question 1

Q2.

Solution

Concept:

Anatropous ovule is the most common type of ovule in angiosperms. It is characterized by the presence of a micropyle and funicle. The structure marked 'X' is the opening through which the pollen tube enters.

Solution:

(a) The diagram shows an anatropous ovule with the micropyle near the funicle.

(b) The micropyle is the small opening in the integuments through which the pollen tube enters the ovule.

(c) The chalaza is the basal part of the ovule.

(d) The integument is the protective covering of the ovule.

(e) The nucellus is the nutritive tissue inside the ovule.

(f) Hence, the structure marked 'X' is the micropyle.

Final Answer: Micropyle

Answer: (D)

Go Back to Question 2

Q3.

Solution

Concept:

The Calvin cycle (C3 pathway) is the dark reaction of photosynthesis. It occurs in the stroma of the chloroplast and involves the fixation of CO_2 into organic compounds.

Solution:

(a) CO_2 is fixed by the enzyme RuBisCO.

(b) The first stable product formed is 3-phosphoglycerate (PGA), a 3-carbon compound.

(c) This is why the pathway is called the C3 pathway.

(d) Oxaloacetate is the first product in C4 plants.

(e) Phosphoenolpyruvate is the CO_2 acceptor in C4 plants.

(f) Ribulose-5-phosphate is regenerated in the cycle but is not the first stable product.

(g) Therefore, the correct answer is 3-Phosphoglycerate.

Final Answer: 3-Phosphoglycerate

Answer: (B)

Go Back to Question 3

Q4.

Solution

Concept:

Monocot stems have certain characteristic features that distinguish them from dicot stems. The presence or absence of cambium is one of the key differences.

Solution:

(a) Monocot stems have scattered vascular bundles.

(b) They have a bundle sheath around vascular bundles.

(c) They do not have a distinct endodermis.

(d) Most importantly, monocot stems lack cambium, which is why they do not show secondary growth.

(e) Dicot stems have a cambium layer that enables secondary growth.

(f) Hence, the absence of cambium is a characteristic feature of monocot stems.

Final Answer: Presence of cambium

Answer: (D)

Go Back to Question 4

Q5.

Solution

Concept:

Chloroplasts are the sites of photosynthesis. They have two main compartments: thylakoids (where light reactions occur) and stroma (where the Calvin cycle occurs).

Solution:

(a) The diagram shows the thylakoid (A) and stroma (B).

(b) Light reactions occur in the thylakoid membrane.

(c) The Calvin cycle occurs in the stroma, which is the fluid-filled space.

(d) Therefore, B (stroma) is the site of the Calvin cycle.

Final Answer: B

Answer: (B)

Go Back to Question 5

Q6.

Solution

Concept:

Linkage refers to the tendency of genes located on the same chromosome to be inherited together. It was first discovered through experiments on sweet peas.

Solution:

(a) Mendel did not discover linkage as his experiments were on genes located on different chromosomes.

(b) Morgan discovered sex-linked inheritance and crossing over.

(c) Bateson and Punnett first observed linkage in sweet peas (Lathyrus odoratus).

(d) Sutton and Boveri proposed the chromosomal theory of inheritance.

(e) Therefore, the correct answer is Bateson and Punnett.

Final Answer: Bateson and Punnett

Answer: (C)

Go Back to Question 6

Q7.

Solution

Concept:

Translation is the process of protein synthesis from mRNA. Peptide bonds are formed between amino acids during this process.

Solution:

(a) RNA polymerase is involved in transcription.

(b) Peptidyl transferase is the enzyme (part of the ribosome) that catalyzes the formation of peptide bonds.

(c) DNA ligase joins DNA fragments.

(d) Ribonuclease degrades RNA.

(e) Therefore, the correct answer is Peptidyl transferase.

Final Answer: Peptidyl transferase

Answer: (B)

Go Back to Question 7

Q8.

Solution

Concept:

Double fertilization is a unique feature of angiosperms. It was discovered by a Russian botanist.

Solution:

(a) Strasburger discovered syngamy.

(b) Nawaschin discovered double fertilization in 1898.

(c) Hofmeister discovered alternation of generations.

(d) Maheshwari worked on embryology of angiosperms.

(e) Therefore, the correct answer is Nawaschin.

Final Answer: Nawaschin

Answer: (B)

Go Back to Question 8

Q9.

Solution

Concept:

In the life cycle of pteridophytes (ferns), there is alternation of generations. The sporophyte is the dominant and independent phase.

Solution:

(a) The sporophyte is diploid (2n) and produces spores.

(b) The gametophyte is haploid (n) and produces gametes.

(c) In ferns, the sporophyte is the dominant phase, while the gametophyte is small and short-lived.

(d) Therefore, the dominant phase is the sporophyte.

Final Answer: Sporophyte

Answer: (A)

Go Back to Question 9

Q10.

Solution

Concept:

Xerophytes are plants adapted to dry conditions. They have various structural and physiological adaptations to conserve water.

Solution:

(a) Aerenchyma is found in hydrophytes for buoyancy.

(b) Sunken stomata reduce transpiration and are a characteristic feature of xerophytes.

(c) Pneumatophores are found in mangroves (halophytes).

(d) Broad leaves increase transpiration and are not a xerophytic adaptation.

(e) Therefore, the correct answer is Sunken stomata.

Final Answer: Sunken stomata

Answer: (B)

Go Back to Question 10

Q11.

Solution

Concept:

Glycolysis is the breakdown of glucose into pyruvate. It involves several enzymatic steps, each catalyzed by a specific enzyme.

Solution:

(a) Hexokinase phosphorylates glucose to glucose-6-phosphate.

(b) Phosphoglucose isomerase converts glucose-6-phosphate to fructose-6-phosphate.

(c) Phosphofructokinase phosphorylates fructose-6-phosphate.

(d) Aldolase splits fructose-1,6-bisphosphate.

(e) Therefore, the correct answer is Phosphoglucose isomerase.

Final Answer: Phosphoglucose isomerase

Answer: (B)

Go Back to Question 11

Q12.

Solution

Concept:

Commensalism is a type of interaction where one organism benefits while the other is neither benefited nor harmed.

Solution:

(a) Lichen is an example of mutualism (algae and fungus).

(b) Cuscuta is a parasite.

(c) Epiphyte on tree is an example of commensalism (epiphyte benefits, tree is unaffected).

(d) Rhizobium in root nodules is mutualism.

(e) Therefore, the correct answer is Epiphyte on tree.

Final Answer: Epiphyte on tree

Answer: (C)

Go Back to Question 12

Q13.

Solution

Concept:

A typical flower has four whorls: calyx, corolla, androecium, and gynoecium. The outermost whorl is the calyx.

Solution:

(a) The diagram shows four concentric whorls.

(b) P is the outermost whorl.

(c) The outermost whorl is the calyx (sepals).

(d) Q is corolla, R is androecium, and S is gynoecium.

(e) Therefore, the correct answer is Calyx.

Final Answer: Calyx

Answer: (A)

Go Back to Question 13

Q14.

Solution

Concept:

Taxonomic hierarchy is the arrangement of organisms in a hierarchical manner. It starts from the broadest category (Kingdom) to the most specific (Species).

Solution:

(a) The correct sequence is Kingdom → Phylum → Class → Order → Family → Genus → Species.

(b) This is the standard Linnaean hierarchy.

(c) All other options have incorrect order of categories.

(d) Therefore, the correct answer is the first option.

Final Answer: Kingdom → Phylum → Class → Order → Family → Genus → Species

Answer: (A)

Go Back to Question 14

Q15.

Solution

Concept:

C4 plants have a specialized mechanism to concentrate CO_2. The initial CO_2 acceptor is a 3-carbon compound.

Solution:

(a) In C4 plants, CO_2 is initially fixed by PEP carboxylase.

(b) The CO_2 acceptor is Phosphoenolpyruvate (PEP).

(c) RuBP is the acceptor in C3 plants.

(d) PGA and OAA are products, not acceptors.

(e) Therefore, the correct answer is PEP.

Final Answer: PEP

Answer: (B)

Go Back to Question 15

Q16.

Solution

Concept:

The nephron is the functional unit of the kidney. Ultrafiltration occurs at the glomerulus inside Bowman's capsule.

Solution:

(a) The diagram shows Bowman's capsule and glomerulus.

(b) Ultrafiltration occurs at the glomerulus due to high blood pressure.

(c) The proximal convoluted tubule, Loop of Henle, and distal convoluted tubule are involved in reabsorption and secretion.

(d) Therefore, the correct answer is Glomerulus.

Final Answer: Glomerulus

Answer: (B)

Go Back to Question 16

Q17.

Solution

Concept:

Pollutants can be primary (emitted directly) or secondary (formed by reaction of primary pollutants in the atmosphere).

Solution:

(a) CO, SO_2, and NO_2 are primary pollutants.

(b) PAN (Peroxyacyl nitrate) is a secondary pollutant formed by photochemical reactions.

(c) Therefore, the correct answer is PAN.

Final Answer: PAN

Answer: (C)

Go Back to Question 17

Q18.

Solution

Concept:

Transcription is the process of synthesis of mRNA from DNA. It occurs in the nucleus in eukaryotes.

Solution:

(a) Transcription is the synthesis of RNA from DNA.

(b) Translation is the synthesis of protein from mRNA.

(c) Replication is the copying of DNA.

(d) Transduction is the transfer of DNA by viruses.

(e) Therefore, the correct answer is Transcription.

Final Answer: Transcription

Answer: (A)

Go Back to Question 18

Q19.

Solution

Concept:

The human heart has four chambers. Oxygenated blood from the lungs enters the left atrium via pulmonary veins.

Solution:

(a) The diagram shows the four chambers.

(b) The left atrium (LA) receives oxygenated blood from the lungs.

(c) The right atrium receives deoxygenated blood from the body.

(d) The ventricles pump blood out of the heart.

(e) Therefore, the correct answer is Left atrium.

Final Answer: Left atrium

Answer: (B)

Go Back to Question 19

Q20.

Solution

Concept:

The nitrogen cycle involves several processes that convert nitrogen into different forms. The correct sequence is important for understanding nutrient cycling.

Solution:

(a) Nitrogen fixation converts atmospheric N_2 into ammonia.

(b) Nitrification converts ammonia into nitrates.

(c) Ammonification converts organic nitrogen into ammonia.

(d) Denitrification converts nitrates back into N_2.

(e) The correct sequence is Nitrogen fixation → Nitrification → Ammonification → Denitrification.

Final Answer: Nitrogen fixation → Nitrification → Ammonification → Denitrification

Answer: (A)

Go Back to Question 20

Q21.

Solution

Concept:

A neuron consists of a cell body, dendrites, and an axon. The axon conducts impulses away from the cell body.

Solution:

(a) Dendrites receive impulses and conduct them towards the cell body.

(b) The axon conducts impulses away from the cell body to the synaptic knob.

(c) Myelin sheath insulates the axon.

(d) The synaptic knob releases neurotransmitters.

(e) Therefore, the correct answer is Axon.

Final Answer: Axon

Answer: (B)

Go Back to Question 21

Q22.

Solution

Concept:

Symbiosis is a close and long-term interaction between two different species. Mutualism is a type of symbiosis where both organisms benefit.

Solution:

(a) Mycorrhiza is a mutualistic association between fungi and plant roots.

(b) Parasitism, predation, and competition are not mutualistic.

(c) Therefore, the correct answer is Mycorrhiza.

Final Answer: Mycorrhiza

Answer: (A)

Go Back to Question 22

Q23.

Solution

Concept:

DNA replication requires several enzymes. The unwinding of the double helix is a crucial initial step.

Solution:

(a) DNA polymerase synthesizes new DNA strands.

(b) Helicase unwinds the DNA double helix by breaking hydrogen bonds.

(c) Ligase joins Okazaki fragments.

(d) Primase synthesizes RNA primers.

(e) Therefore, the correct answer is Helicase.

Final Answer: Helicase

Answer: (B)

Go Back to Question 23

Q24.

Solution

Concept:

Protein digestion begins in the stomach and is completed in the small intestine. The stomach provides the acidic environment for pepsin.

Solution:

(a) The diagram shows the stomach and small intestine.

(b) Pepsin in the stomach initiates protein digestion.

(c) Trypsin and other enzymes in the small intestine complete the digestion.

(d) The mouth and large intestine do not play a major role in protein digestion.

(e) Therefore, the correct answer is Stomach.

Final Answer: Stomach

Answer: (B)

Go Back to Question 24

Q25.

Solution

Concept:

Prokaryotic cells lack membrane-bound organelles and a true nucleus. This is a fundamental distinction from eukaryotic cells.

Solution:

(a) Prokaryotes lack a nuclear membrane.

(b) They have 70S ribosomes, not 80S.

(c) They lack membrane-bound organelles like mitochondria.

(d) Therefore, the absence of membrane-bound organelles is a characteristic feature of prokaryotic cells.

Final Answer: Absence of membrane-bound organelles

Answer: (C)

Go Back to Question 25

Q26.

Solution

Concept:

Mitochondria are the sites of aerobic respiration. The Krebs cycle occurs in the matrix of the mitochondrion.

Solution:

(a) The diagram shows the matrix (A).

(b) The Krebs cycle (TCA cycle) occurs in the mitochondrial matrix.

(c) The electron transport chain occurs on the inner membrane.

(d) The outer membrane and intermembrane space do not host the Krebs cycle.

(e) Therefore, the correct answer is Matrix.

Final Answer: Matrix

Answer: (C)

Go Back to Question 26

Q27.

Solution

Concept:

The Golgi apparatus is involved in the modification, packaging, and secretion of proteins and lipids.

Solution:

(a) Protein synthesis occurs on ribosomes.

(b) Lipid synthesis occurs in the smooth endoplasmic reticulum.

(c) The Golgi apparatus packages and secretes proteins.

(d) Energy production occurs in mitochondria.

(e) Therefore, the correct answer is Packaging and secretion of proteins.

Final Answer: Packaging and secretion of proteins

Answer: (C)

Go Back to Question 27

Q28.

Solution

Concept:

Bacteriophages are viruses that infect bacteria. They have a head that contains the genetic material (DNA or RNA).

Solution:

(a) The diagram shows the head and tail.

(b) The head (capsid) contains the genetic material.

(c) The tail sheath, tail fibers, and base plate are involved in attachment and injection of genetic material.

(d) Therefore, the correct answer is Head.

Final Answer: Head

Answer: (A)

Go Back to Question 28

Q29.

Solution

Concept:

Parasitic plants derive nutrients from their host. Cuscuta is a classic example of a stem parasite.

Solution:

(a) Cuscuta (dodder) is a parasitic plant that lacks chlorophyll and derives nutrients from the host.

(b) Orchid is an epiphyte.

(c) Lichen is a mutualistic association.

(d) Rhizobium is a symbiotic nitrogen fixer.

(e) Therefore, the correct answer is Cuscuta.

Final Answer: Cuscuta

Answer: (A)

Go Back to Question 29

Q30.

Solution

Concept:

Insects have a complete digestive system. The midgut is the main site of digestion and absorption.

Solution:

(a) The crop stores food.

(b) The gizzard grinds food.

(c) The midgut is the main site of enzymatic digestion and absorption.

(d) The hindgut is mainly for water reabsorption.

(e) Therefore, the correct answer is Midgut.

Final Answer: Midgut

Answer: (C)

Go Back to Question 30

Q31.

Solution

Concept:

The life cycle of a mosquito involves four stages: egg, larva, pupa, and adult. This is an example of complete metamorphosis.

Solution:

(a) The correct sequence is Egg → Larva → Pupa → Adult.

(b) All other options have incorrect order.

(c) Therefore, the correct answer is the first option.

Final Answer: Egg → Larva → Pupa → Adult

Answer: (A)

Go Back to Question 31

Q32.

Solution

Concept:

Tapeworms (cestodes) attach to the host intestine using a specialized structure called the scolex.

Solution:

(a) The diagram shows the scolex with hooks and suckers.

(b) The scolex is the anterior end used for attachment.

(c) The neck, proglottids, and strobila are posterior segments.

(d) Therefore, the correct answer is Scolex.

Final Answer: Scolex

Answer: (A)

Go Back to Question 32

Q33.

Solution

Concept:

Biological control uses natural enemies to control pests. Bacillus thuringiensis is a bacterium used as a biopesticide.

Solution:

(a) Bacillus thuringiensis produces toxins that kill insect larvae.

(b) DDT, Malathion, and Carbaryl are chemical pesticides.

(c) Therefore, the correct answer is Bacillus thuringiensis.

Final Answer: Bacillus thuringiensis

Answer: (A)

Go Back to Question 33

Q34.

Solution

Concept:

Earthworms have a straight alimentary canal. The intestine is the main site of digestion and absorption.

Solution:

(a) The pharynx sucks food.

(b) The crop stores food.

(c) The gizzard grinds food.

(d) The intestine is the main site of enzymatic digestion and absorption.

(e) Therefore, the correct answer is Intestine.

Final Answer: Intestine

Answer: (D)

Go Back to Question 34

Q35.

Solution

Concept:

Photosynthesis consists of two main phases: light-dependent reactions and the Calvin cycle (dark reactions).

Solution:

(a) Light reactions occur first and produce ATP and NADPH.

(b) The Calvin cycle uses ATP and NADPH to fix CO_2.

(c) The correct sequence is Light reaction $\rightarrow$ Calvin cycle.

(d) All other options have incorrect sequences.

Final Answer: Light reaction $\rightarrow$ Calvin cycle

Answer: (A)

Go Back to Question 35

Q36.

Solution

Concept:

Insects respire through a tracheal system. Air enters through openings called spiracles.

Solution:

(a) The trachea is the internal tube system.

(b) Spiracles are the external openings on the body surface.

(c) Malpighian tubules are excretory organs.

(d) The crop is part of the digestive system.

(e) Therefore, the correct answer is Spiracle.

Final Answer: Spiracle

Answer: (B)

Go Back to Question 36

Q37.

Solution

Concept:

Vector-borne diseases are transmitted by vectors such as mosquitoes. Malaria is transmitted by Anopheles mosquitoes.

Solution:

(a) Malaria is caused by Plasmodium and transmitted by Anopheles mosquitoes.

(b) Tuberculosis, Cholera, and Typhoid are not vector-borne.

(c) Therefore, the correct answer is Malaria.

Final Answer: Malaria

Answer: (A)

Go Back to Question 37

Q38.

Solution

Concept:

The kidney is divided into cortex and medulla. The functional unit of the kidney is the nephron.

Solution:

(a) The cortex and medulla are regions of the kidney.

(b) The nephron is the structural and functional unit where filtration, reabsorption, and secretion occur.

(c) The pelvis collects urine.

(d) Therefore, the correct answer is Nephron.

Final Answer: Nephron

Answer: (C)

Go Back to Question 38

Q39.

Solution

Concept:

Digestion in humans occurs in a specific sequence through different parts of the alimentary canal.

Solution:

(a) Food enters through the mouth, where digestion begins.

(b) It then moves to the stomach for further digestion.

(c) Most digestion and absorption occur in the small intestine.

(d) The large intestine absorbs water and forms feces.

(e) The correct sequence is Mouth → Stomach → Small intestine → Large intestine.

Final Answer: Mouth → Stomach → Small intestine → Large intestine

Answer: (A)

Go Back to Question 39

Q40.

Solution

Concept:

Plant cells and animal cells share several membrane-bound organelles due to their eukaryotic nature. However, they possess distinct structural differences that accommodate their specific metabolic and ecological needs, such as photosynthesis and structural rigidity.

Solution:

(a) Mitochondria, Golgi apparatus, and ribosomes are universal eukaryotic components found in both plant and animal cells for respiration, protein packaging, and translation.

(b) Plastids are specialized double-membrane organelles exclusive to plants and algae. They include chloroplasts for photosynthesis, chromoplasts for pigment storage, and leucoplasts for food storage.

(c) Plant cells feature a massive, permanent central vacuole that maintains turgor pressure against the rigid cell wall, providing structural support to the entire plant tissue.

(d) Animal cells completely lack plastids because they are heterotrophic organisms and do not synthesize their own food via light energy.

(e) While animal cells may contain vacuoles, they are always small, temporary, and primarily function in intracellular digestion or transport rather than turgor maintenance.

Final Answer: Plastids (chloroplasts, chromoplasts, leucoplasts) and a large central vacuole.

Answer: (C)

Go Back to Question 40

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	A	2	D	3	B	4	D	5	B
6	C	7	B	8	B	9	A	10	B
11	B	12	C	13	A	14	A	15	B
16	B	17	C	18	A	19	B	20	A
21	B	22	A	23	B	24	B	25	C
26	C	27	C	28	A	29	A	30	C
31	A	32	A	33	A	34	D	35	A
36	B	37	A	38	C	39	A	40	C