NEET 2024 R2 Zoology Question Paper with Solutions

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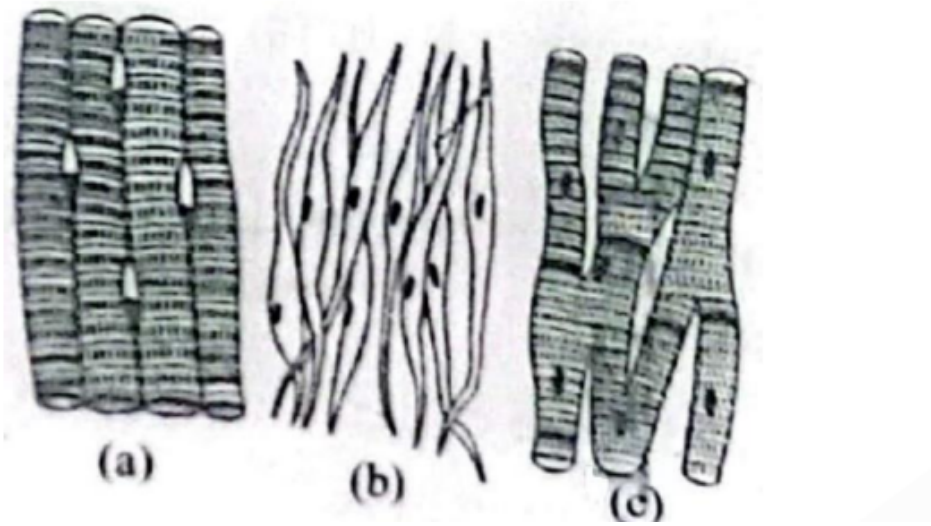
151. Three types of muscles are given as a, b, and c. Identify the correct matching pair along with their location in the human body:



Name of muscle/location

(1) (a) Skeletal - Triceps
  (b) Smooth – Stomach
  (c) Cardiac – Heart

(2) (a) Skeletal - Biceps
  (b) Involuntary – Intestine
  (c) Smooth – Heart

(3) (a) Involuntary – Nose tip
  (b) Skeletal – Bone
  (c) Cardiac – Heart

(4) (a) Smooth - Toes
  (b) Skeletal – Legs
  (c) Cardiac – Heart

Correct Answer: (1) (a) Skeletal - Triceps
(b) Smooth – Stomach

(c) Cardiac – Heart

Solution:

- **Skeletal muscle** is found in the triceps and is voluntary in nature (a).

- **Smooth muscle** is found in the walls of the stomach and is involuntary (b).

- **Cardiac muscle** is found in the heart and is involuntary (c).

Thus, the correct answer is **(1) (a) Skeletal - Triceps, (b) Smooth – Stomach, (c) Cardiac – Heart**.

Quick Tip

Skeletal muscle is voluntary and attached to bones, smooth muscle is involuntary and found in internal organs, and cardiac muscle is involuntary, found only in the heart.

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152. Following are the stages of the pathway for conduction of an action potential through the heart: A. AV bundle B. Purkinje fibres C. AV node D. Bundle branches E. SA node Choose the correct sequence of the pathway from the options given below:

(1) A-E-C-B-D

(2) B-D-E-C-A

(3) E-A-D-B-C

(4) E-C-A-D-B

Correct Answer: (4) E-C-A-D-B

Solution:

The correct sequence of action potential conduction in the heart is: - The impulse originates at the **SA node** (E), then travels to the **AV node** (C).

- From the AV node, the impulse moves to the **AV bundle** (A), followed by the **Bundle branches** (D), and then reaches the **Purkinje fibres** (B).

Thus, the correct answer is **(4) E-C-A-D-B**.

Quick Tip

The SA node initiates the electrical impulse that propagates through the heart, ensuring coordinated contraction and proper circulation.

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153. Which one of the following factors will not affect the Hardy-Weinberg equilibrium?

(1) Genetic drift

(2) Gene migration

(3) Constant gene pool

(4) Genetic recombination

Correct Answer: (3) Constant gene pool

Solution:

The **Hardy-Weinberg equilibrium** assumes no change in allele frequencies in a population, meaning no evolution occurs. The factors that can affect this equilibrium include: - **Genetic drift**, which causes random changes in allele frequencies, especially in small populations.
- **Gene migration** or **gene flow**, which introduces new alleles into a population.
- **Genetic recombination**, which creates new allele combinations but does not affect allele frequencies directly.
A **constant gene pool** is the assumption that the genetic makeup remains stable, and therefore does not affect the equilibrium.
Thus, the correct answer is **(3) Constant gene pool**.

Quick Tip

The Hardy-Weinberg equilibrium assumes no change in allele frequencies, but genetic drift, migration, and recombination can all disrupt this balance.

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154. Which of the following statements is incorrect?

(1) Most commonly used bio-reactors are of stirring type

(2) Bio-reactors are used to produce small-scale bacterial cultures

(3) Bio-reactors have an agitator system, an oxygen delivery system, and foam control system

(4) A bio-reactor provides optimal growth conditions for achieving the desired product

Correct Answer: (2) Bio-reactors are used to produce small-scale bacterial cultures

Solution:

Bio-reactors are primarily used for large-scale production of microbial cultures, not small-scale. They provide optimal growth conditions by regulating factors like temperature, pH, and oxygen levels to enhance the production of desired products such as antibiotics, enzymes, and biofuels.

Thus, the correct answer is **(2) Bio-reactors are used to produce small-scale bacterial cultures**.

Quick Tip

Bio-reactors are critical for large-scale production in biotechnology, ensuring controlled conditions for optimal product yield.

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155. Which one is the correct product of DNA-dependent RNA polymerase to the given template? 3'TACATGGCAAATATCCATTCA5'

(1) 5'AUGUAAAGUUUAUAGGUAAGU3'

(2) 5'AUGUACCGUUUAUAGGGAAGU3'

(3) 5'ATGTACCGTTTATAGGTAAGT3'

(4) 5'AUGUACCGUUUAUAGGUAAGU3'

Correct Answer: (4) 5'AUGUACCGUUUAUAGGUAAGU3'

Solution:

DNA-dependent RNA polymerase transcribes the template strand of DNA to RNA. In this case, the RNA sequence will be complementary to the given DNA template: - The sequence 3'TACATGGCAAATATCCATTCA5' is transcribed to 5'AUGUACCGUUUAUAGGUAAGU3'.

Thus, the correct answer is **(4) 5'AUGUACCGUUUAUAGGUAAGU3'**.

Quick Tip

RNA polymerase synthesizes mRNA in the 5' to 3' direction, complementary to the DNA template strand.

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156. Match List I with List II

List I	**List II**
A. α –I antitrypsin	I. Cotton bollworm
B. Cry IAb	IV. Corn borer
C. Cry IAc	I. Cotton bollworm
D. Enzyme replacement therapy	II. ADA deficiency

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (2) A-III, B-IV, C-I, D-II

Solution:

- **A. –I antitrypsin** is associated with **Emphysema** (A-III).
- **B. Cry IAb** is toxic to the **Cotton bollworm** (B-I).
- **C. Cry IAc** is toxic to the **Corn borer** (C-I).
- **D. Enzyme replacement therapy** is used to treat **ADA deficiency** (D-II).

Thus, the correct answer is **(2) A-III, B-IV, C-I, D-II**.

Quick Tip

Cry proteins from Bacillus thuringiensis are specific to different insect pests, and -I antitrypsin is used to treat emphysema.

157. Which of the following are Autoimmune disorders?

A. Myasthenia gravis

B. Rheumatoid arthritis

C. Gout

D. Muscular dystrophy

E. Systemic Lupus Erythematosus (SLE)

Choose the most appropriate answer from the options given below:

(1) A, B E only

(2) B, C E only

(3) C, D E only

(4) A, B D only

Correct Answer: (1) A, B E only

Solution:

- **Myasthenia gravis, Rheumatoid arthritis, and Systemic Lupus Erythematosus (SLE)** are all autoimmune disorders, where the immune system attacks the body's own tissues.

- **Gout** is not an autoimmune disorder; it is caused by the accumulation of uric acid crystals.

- **Muscular dystrophy** is a genetic disorder, not autoimmune.

Thus, the correct answer is **(1) A, B E only**.

Quick Tip

Autoimmune diseases involve the immune system mistakenly attacking the body's own cells, leading to conditions like rheumatoid arthritis and SLE.

158. Match List I with List II:

	List I		List II
A.	Down's syndrome	I.	11^{th} chromosome
B.	α-Thalassemia	II.	'X' chromosome
C.	β-Thalassemia	III.	21^{st} chromosome
D.	Klinefelter's syndrome	IV.	16^{th} chromosome

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (2) A-III, B-IV, C-I, D-II

Solution:

- **A. Down's syndrome** is caused by a trisomy of chromosome 21, so it matches with **III. 21st chromosome**.
- **B. α-Thalassemia** is linked to mutations on chromosome 16, so it matches with **IV. 16th chromosome**.
- **C. β-Thalassemia** is linked to mutations on chromosome 11, so it matches with **I. 11th chromosome**.
- **D. Klinefelter's syndrome** is associated with an extra X chromosome in males, so it matches with **II. 'X' chromosome**.

Thus, the correct answer is **(2) A-III, B-IV, C-I, D-II**.

Quick Tip

Klinefelter's syndrome involves an additional X chromosome, while Down's syndrome involves a trisomy of chromosome 21.

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159. Given below are two statements:

Statement I: In the nephron, the descending limb of the loop of Henle is impermeable to water and permeable to electrolytes.

Statement II: The proximal convoluted tubule is lined by simple columnar brush border epithelium and increases the surface area for reabsorption. In the light of the above statements, choose the correct answer from the options given below:

(1) Both Statement I and Statement II are false

(2) Statement I is true but Statement II is false

(3) Statement I is false but Statement II is true

(4) Both Statement I and Statement II are true

Correct Answer: (1) Both Statement I and Statement II are false

Solution:

- **Statement I:** The descending limb of the loop of Henle is permeable to water but impermeable to electrolytes, so this statement is false.
- **Statement II:** The proximal convoluted tubule is lined by **cuboidal** epithelium, not columnar, and increases the surface area for reabsorption through microvilli, so this statement is also false.

Thus, the correct answer is **(1) Both Statement I and Statement II are false**.

Quick Tip

The descending limb of the loop of Henle is permeable to water, and the proximal convoluted tubule has cuboidal epithelium.

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160. Match List I with List II:

	List I		List II
A.	Pons	I.	Provides additional space for Neurons, regulates posture and balance.
B.	Hypothalamus	II.	Controls respiration and gastric secretions.
C.	Medulla	III.	Connects different regions of the brain.
D.	Cerebellum	IV.	Neuro secretory cells

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (1) A-III, B-IV, C-II, D-I

Solution:

- **A. Pons** connects different regions of the brain and is associated with regulating respiration, so it matches with **III. Connects different regions of the brain**.
- **B. Hypothalamus** contains neurosecretory cells, which control various hormonal functions, so it matches with **IV. Neurosecretory cells**.
- **C. Medulla** controls respiration and gastric secretions, so it matches with **II. Controls respiration and gastric secretions**.
- **D. Cerebellum** is responsible for maintaining posture and balance, so it matches with **I. Provides additional space for neurons, regulates posture and balance**.

Thus, the correct answer is **(1) A-III, B-IV, C-II, D-I**.

Quick Tip

The pons is involved in connecting brain regions, the hypothalamus controls hormone secretion, the medulla regulates vital functions, and the cerebellum coordinates movement and balance.

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161. Match List I with List II:

	List I		List II
A.	Axoneme	I.	Centriole
B.	Cartwheel pattern	II.	Cilia and flagella
C.	Crista	III.	Chromosome
D.	Satellite	IV.	Mitochondria

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-II, B-I, C-IV, D-III

Solution:

- **A. Axoneme** is the structure found in **cilia and flagella**, so it matches with **II. Cilia and flagella**.

- **B. Cartwheel pattern** is observed in the structure of **centriole**, so it matches with **I. Centriole**.

- **C. Crista** is found in the inner membrane of **mitochondria**, so it matches with **IV. Mitochondria**.

- **D. Satellite** refers to the associated small bodies near **chromosomes**, so it matches with **III. Chromosome**.

Thus, the correct answer is **(3) A-II, B-I, C-IV, D-III**.

Quick Tip

The axoneme is a structural component of cilia and flagella, centrioles have a cartwheel pattern, cristae are found in mitochondria, and satellites are associated with chromosomes.

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162. Match List I with List II:

	List I		List II
A.	Fibrous joints	I.	Adjacent vertebrae, limited movement
B.	Cartilaginous joints	II.	Humerus and Pectoral girdle, rotational movement
C.	Hinge joints	III.	Skull, don't allow any movement
D.	Ball and socket joints	IV.	Knee, help in locomotion

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-III, B-I, C-IV, D-II

Solution:

- **A. Fibrous joints** are found in the **skull**, where no movement occurs, so it matches with **III. Skull, don't allow any movement**.

- **B. Cartilaginous joints** are found between adjacent vertebrae, where limited movement occurs, so it matches with **I. Adjacent vertebrae, limited movement**.

- **C. Hinge joints** allow movement in one direction, such as in the **knee**, so it matches with **IV. Knee, help in locomotion**.

- **D. Ball and socket joints** allow rotational movement, such as in the **humerus and pectoral girdle**, so it matches with **II. Humerus and Pectoral girdle, rotational movement**.

Thus, the correct answer is **(3) A-III, B-I, C-IV, D-II**.

Quick Tip

Fibrous joints are immovable, cartilaginous joints allow limited movement, hinge joints allow bending, and ball-and-socket joints allow rotational movement.

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163. Match List I with List II:

	List I		List II
A.	*Pterophyllum*	I.	Hag fish
B.	*Myxine*	II.	Saw fish
C.	*Pristis*	III.	Angel fish
D.	*Exocoetus*	IV.	Flying fish

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (1) A-III, B-I, C-II, D-IV

Solution:

- **A. Pterophyllum** is known as the **angel fish** (A-III).

- **B. Myxine** is the scientific name for the **hag fish** (B-I).

- **C. Pristis** is the scientific name for the **saw fish** (C-II).

- **D. Exocoetus** is the scientific name for the **flying fish** (D-IV).

Thus, the correct answer is **(1) A-III, B-I, C-II, D-IV**.

Quick Tip

Pterophyllum is the angel fish, Myxine is the hag fish, Pristis is the saw fish, and Exocoetus is the flying fish.

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164. Following are the stages of cell division:

A. Gap 2 phase

B. Cytokinesis

C. Synthesis phase

D. Karyokinesis

E. Gap 1 phase Choose the correct sequence of stages from the options given below:

(1) E-B-D-A-C

(2) B-D-E-A-C

(3) E-C-A-D-B

(4) C-E-D-A-B

Correct Answer: (3) E-C-A-D-B

Solution:

The correct sequence of stages in cell division is: - **E. Gap 1 phase**, where the cell grows.

- **C. Synthesis phase**, where DNA replication occurs.

- **A. Gap 2 phase**, where the cell continues to grow and prepare for division.

- **D. Karyokinesis**, where the nucleus divides.

- **B. Cytokinesis**, where the cytoplasm divides, completing the process.

Thus, the correct answer is **(3) E-C-A-D-B**.

Quick Tip

Cell division progresses in a highly regulated sequence: G1, S, G2, followed by karyokinesis and cytokinesis.

165. Match List I with List II

	List I		List II
A.	Non-medicated IUD	I.	Multiload 375
B.	Copper releasing IUD	II.	Progestogens
C.	Hormone releasing IUD	III.	Lippes loop
D.	Implants	IV.	LNG-20

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-III, B-I, C-IV, D-II

Solution:

- **A. Non-medicated IUD** is represented by **Lippes loop** (III).
- **B. Copper releasing IUD** is represented by **Multiload 375** (I).
- **C. Hormone releasing IUD** is represented by **LNG-20** (IV).
- **D. Implants** are represented by **Progestogens** (II).

Thus, the correct answer is **(3) A-III, B-I, C-IV, D-II**.

Quick Tip

IUDs are categorized based on their medication type: non-medicated, copper-releasing, hormone-releasing, and implants.

166. Match List I with List II:

	List-I		List-II
A.	Lipase	I.	Peptide bond
B.	Nuclease	II.	Ester bond
C.	Protease	III.	Glycosidic bond
D.	Amylase	IV.	Phosphodiester bond

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (2) A-II, B-IV, C-I, D-III

Solution:

- **A. Lipase** breaks **ester bonds** (II).
- **B. Nuclease** breaks **phosphodiester bonds** (IV).
- **C. Protease** breaks **peptide bonds** (I).
- **D. Amylase** breaks **glycosidic bonds** (III).

Thus, the correct answer is **(2) A-II, B-IV, C-I, D-III**.

Quick Tip

Each enzyme acts on a specific type of bond: lipase on ester bonds, nuclease on phosphodiester bonds, protease on peptide bonds, and amylase on glycosidic bonds.

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167. Match List I with List II:

	List I		List II
A.	Expiratory capacity	I.	Expiratory reserve volume + Tidal volume + Inspiratory reserve volume
B.	Functional residual capacity	II.	Tidal volume + Expiratory reserve volume
C.	Vital capacity	III.	Tidal volume + Inspiratory reserve volume
D.	Inspiratory capacity	IV.	Expiratory reserve volume + Residual volume

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (4) A-II, B-IV, C-I, D-III

Solution:

- **A. Expiratory capacity** is **Tidal volume + Expiratory reserve volume** (II).

- **B. Functional residual capacity** is **Expiratory reserve volume + Residual volume** (IV).

- **C. Vital capacity** is **Expiratory reserve volume + Tidal volume + Inspiratory reserve volume** (I).

- **D. Inspiratory capacity** is **Tidal volume + Inspiratory reserve volume** (III).

Thus, the correct answer is **(4) A-II, B-IV, C-I, D-III**.

Quick Tip

The capacities in pulmonary function tests include various combinations of tidal volume, expiratory reserve volume, and inspiratory reserve volume.

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168. Match List I with List II:

	List I		List II
A.	Cocaine	I.	Effective sedative in surger
B.	Heroin	II.	*Cannabis sativa*
C.	Morphine	III.	*Erythroxylum*
D.	Marijuana	IV.	*Papaver somniferum*

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-III, B-IV, C-I, D-II

Solution:

- **A. Cocaine** comes from **Erythroxylum** (III).
- **B. Heroin** is derived from **Papaver somniferum** (IV).
- **C. Morphine** is also derived from **Papaver somniferum** (I).
- **D. Marijuana** comes from **Cannabis sativa** (II).

Thus, the correct answer is **(3) A-III, B-IV, C-I, D-II**.

Quick Tip

Cocaine and heroin are derived from plants, while morphine comes from opium poppies and marijuana from cannabis.

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169. The flippers of the Penguins and Dolphins are the example of:

(1) Natural selection

(2) Convergent evolution

(3) Divergent evolution

(4) Adaptive radiation

Correct Answer: (2) Convergent evolution

Solution:

The flippers of penguins and dolphins are examples of **convergent evolution**, where different species independently evolve similar traits as a result of having to adapt to similar environments.

Thus, the correct answer is **(2) Convergent evolution**.

Quick Tip

Convergent evolution occurs when unrelated species evolve similar traits due to similar environmental pressures.

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

Assertion A: Breast-feeding during the initial period of infant growth is recommended by doctors for bringing a healthy baby.

Reason R: Colostrum contains several antibodies absolutely essential to develop resistance for the newborn baby.

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

(1) Both A and R are correct but R is NOT the correct explanation of A

(2) A is correct but R is not correct

(3) A is not correct but R is correct

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

Correct Answer: (4) Both A and R are correct and R is the correct explanation of A

Solution:

- **Assertion A** is correct: Breastfeeding is highly recommended during the early stages of an infant's development.

- **Reason R** is also correct: Colostrum, the first milk produced, contains antibodies that help in building the baby's immunity.

Thus, the correct answer is **(4) Both A and R are correct and R is the correct explanation of A**.

Quick Tip

Colostrum is rich in antibodies, providing essential immunity to the newborn during the early days.

171. Which of the following is not a component of the Fallopian tube?

(1) Isthmus

(2) Infundibulum

(3) Ampulla

(4) Uterine fundus

Correct Answer: (4) Uterine fundus

Solution:

The uterine fundus is part of the uterus, not the Fallopian tube. The Fallopian tube consists of the infundibulum, ampulla, and isthmus.

Thus, the correct answer is **(4) Uterine fundus**.

Quick Tip

The uterine fundus is the upper portion of the uterus, not part of the Fallopian tube.

172. Match List I with List II:

	List I		List II
A.	Typhoid	I.	Fungus
B.	Leishmaniasis	II.	Nematode
C.	Ringworm	III.	Protozoa
D.	Filariasis	IV.	Bacteria

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (1) A-IV, B-III, C-I, D-II

Solution:

- **A. Typhoid** is caused by a **bacterium**, so it matches with **IV. Bacteria**.

- **B. Leishmaniasis** is caused by a **protozoan**, so it matches with **III. Protozoa**.

- **C. Ringworm** is caused by a **fungus**, so it matches with **I. Fungus**.

- **D. Filariasis** is caused by a **nematode**, so it matches with **II. Nematode**.

Thus, the correct answer is **(1) A-IV, B-III, C-I, D-II**.

Quick Tip

Different diseases are caused by different organisms: bacteria (Typhoid), protozoa (Leishmaniasis), fungi (Ringworm), and nematodes (Filariasis).

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173. Match List I with List II:

	List I		List II
A.	Common cold	I.	*Plasmodium*
B.	Haemozoin	II.	Typhoid
C.	Widal test	III.	Rhinoviruses
D.	Allergy	IV	Dust mites

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (2) A-III, B-I, C-II, D-IV

Solution:

- **A. Common cold** is caused by **Rhinoviruses**, so it matches with **III. Rhinoviruses**.

- **B. Haemozoin** is a byproduct of the malaria-causing **Plasmodium**, so it matches with **I. Plasmodium**.

- **C. Widal test** is used to diagnose **Typhoid**, so it matches with **II. Typhoid**.

- **D. Allergy** can be triggered by **Dust mites**, so it matches with **IV. Dust mites**.

Thus, the correct answer is **(2) A-III, B-I, C-II, D-IV**.

Quick Tip

Common cold is caused by rhinoviruses, malaria by Plasmodium, and allergies by dust mites. The Widal test is used for diagnosing typhoid.

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174. Given below are some stages of human evolution. Arrange them in correct sequence. (Past to Recent) A. Homo habilis

B. Homo sapiens

C. Homo neanderthalensis

D. Homo erectus Choose the correct sequence of human evolution from the options given below:

(1) B-A-D-C

(2) C-B-D-A

(3) A-D-C-B

(4) D-A-C-B

Correct Answer: (3) A-D-C-B

Solution:

The correct sequence of human evolution, from past to recent, is:

- **A. Homo habilis** was one of the earliest members of the genus Homo.
- **D. Homo erectus** evolved next, showing more advanced tool use.
- **C. Homo neanderthalensis** followed, characterized by a robust build.
- **B. Homo sapiens** are the modern humans, representing the most recent stage of evolution.

Thus, the correct answer is **(3) A-D-C-B**.

Quick Tip

The human evolutionary sequence shows a gradual increase in brain size and complexity from Homo habilis to Homo sapiens.

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175. Given below are two statements: One is labelled as Assertion A and the other is

labelled as Reason R:

Assertion A: FSH acts upon ovarian follicles in female and Leydig cells in male.

Reason R: Growing ovarian follicles secrete estrogen in female while interstitial cells secrete androgen in male human being. In the light of the above statements, choose the correct answer from the options given below:

(1) Both A and R are true but R is NOT the correct explanation of A

(2) A is true but R is false

(3) A is false but R is true

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

Correct Answer: (3) A is false but R is true

Solution:

- **Assertion A** is false because FSH acts on ovarian follicles in females and Sertoli cells in males, not Leydig cells.
- **Reason R** is true because growing ovarian follicles secrete estrogen, and interstitial cells (Leydig cells) secrete androgens in males.

Thus, the correct answer is **(3) A is false but R is true**.

Quick Tip

FSH plays key roles in both male and female reproductive systems but acts on different cells in males (Sertoli cells) and females (ovarian follicles).

---

176. Which of the following is not a steroid hormone?

(1) Testosterone

(2) Progesterone

(3) Glucagon

(4) Cortisol

Correct Answer: (3) Glucagon

Solution:

- **Testosterone**, **Progesterone**, and **Cortisol** are steroid hormones, derived from cholesterol and characterized by a four-ring structure.
- **Glucagon**, however, is a peptide hormone, not a steroid.

Thus, the correct answer is **(3) Glucagon**.

Quick Tip

Steroid hormones are derived from cholesterol and include hormones like testosterone and cortisol, while glucagon is a peptide hormone.

---

177. Consider the following statements:

A. Annelids are true coelomates.

B. Poriferans are pseudocoelomates.

C. Aschelminthes are acoelomates.

D. Platyhelminthes are pseudocoelomates.

Choose the correct answer from the options given below:

(1) A only

(2) C only

(3) D only

(4) B only

Correct Answer: (1) A only

Solution:

- **A. Annelids** are true coelomates, meaning they have a well-developed coelom.
- **B. Poriferans** are not pseudocoelomates; they lack a true coelom.
- **C. Aschelminthes** are pseudocoelomates, not acoelomates.
- **D. Platyhelminthes** are acoelomates, not pseudocoelomates.

Thus, the correct answer is **(1) A only**.

Quick Tip

True coelomates, such as annelids, have a true coelom, while pseudocoelomates (e.g., aschelminthes) have a body cavity that is not fully lined by mesoderm.

---

178. Match List I with List II:

	List I (Sub Phases of Prophase I)		List II (Specific Characters)
A.	Diakinesis	I.	Synaptonemal complex formation
B.	Pachytene	II.	Completion of terminalisation of chiasmata
C.	Zygotene	III.	Chromosomes look like thin threads
D.	Leptotene	IV.	Appearance of recombination nodules

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (2) A-II, B-IV, C-I, D-III

Solution:

- **A. Diakinesis** involves the completion of terminalisation of chiasmata (II).
- **B. Pachytene** is characterized by the appearance of recombination nodules (IV).
- **C. Zygotene** involves the formation of the synaptonemal complex (I).
- **D. Leptotene** is characterized by chromosomes appearing as thin threads (III).

Thus, the correct answer is **(2) A-II, B-IV, C-I, D-III**.

Quick Tip

Prophase I of meiosis consists of several sub-stages that prepare homologous chromosomes for crossing over and segregation.

---

179. Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli?

(1) High pO2 and Lesser H+ concentration

(2) Low pCO2 and High H+ concentration

(3) Low pCO2 and High temperature

(4) High pO2 and High pCO2

Correct Answer: (1) High pO2 and Lesser H+ concentration

Solution:

Oxyhemoglobin forms more readily when oxygen levels are high (high pO2) and when the concentration of H+ ions is lower, as in the lungs, where the pH is relatively higher.

Thus, the correct answer is **(1) High pO2 and Lesser H+ concentration**.

Quick Tip

Oxygen binds more effectively to hemoglobin in conditions of high pO2 and low H+ concentration.

---

180. In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on:

(1) 10th segment

(2) 8th and 9th segment

(3) 11th segment

(4) 5th segment

Correct Answer: (1) 10th segment

Solution:

In cockroaches, the anal cerci are a pair of jointed, filamentous structures that are located on the 10th segment of the abdomen. These cerci are sensory organs that help the cockroach detect air currents and vibrations.

Thus, the correct answer is **(1) 10th segment**.

Quick Tip

The anal cerci in cockroaches are used for sensory perception, helping detect environmental changes.

---

181. Match List I with List II:

	List I		List II
A.	Pleurobrachia	I.	Mollusca
B.	Radula	II.	Ctenophora
C.	Stomochord	III.	Osteichthyes
D.	Air bladder	IV.	Hemichordata

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (1) A-II, B-I, C-IV, D-III

Solution:

- **A. Pleurobrachia** is a member of the phylum **Ctenophora** (II).
- **B. Radula** is found in organisms from the phylum **Mollusca** (I).
- **C. Stomochord** is a characteristic feature of organisms from the phylum **Hemichordata** (IV).
- **D. Air bladder** is found in fish from the phylum **Osteichthyes** (III).

Thus, the correct answer is **(1) A-II, B-I, C-IV, D-III**.

Quick Tip

Pleurobrachia belongs to Ctenophora, the radula is a molluscan characteristic, the stomochord is present in Hemichordates, and air bladders are found in osteichthyes.

---

182. The "Ti plasmid" of Agrobacterium tumefaciens stands for:

(1) Tumor independent plasmid

(2) Tumor inducing plasmid

(3) Temperature independent plasmid

(4) Tumor inhibiting plasmid

Correct Answer: (2) Tumor inducing plasmid

Solution:

The **Ti plasmid** in Agrobacterium tumefaciens is responsible for inducing tumor formation in plants. It carries genes that integrate into the plant genome, causing uncontrolled growth and formation of tumors known as crown galls.

Thus, the correct answer is **(2) Tumor inducing plasmid**.

Quick Tip

The Ti plasmid is a crucial tool in plant genetic engineering, used for transferring genes into plant cells.

---

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

Assertion A: The presence or absence of hymen is not a reliable indicator of virginity.

Reason R: The hymen is torn during the first coitus only.

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

(1) Both Statement I and Statement II are false

(2) Statement I is true but Statement II is false

(3) Statement I is false but Statement II is true

(4) Both Statement I and Statement II are true

Correct Answer: (2) Statement I is true but Statement II is false

Solution:

- **Assertion A** is true because the hymen can stretch, tear, or remain intact for reasons unrelated to sexual activity.
- **Reason R** is false because the hymen can be torn or stretched due to various activities, not only during coitus.

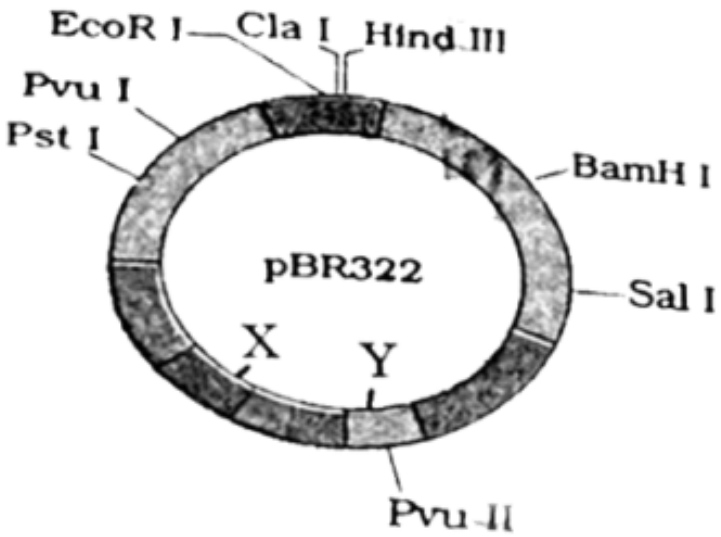
Thus, the correct answer is **(2) Statement I is true but Statement II is false**.

Quick Tip

The hymen is not a reliable indicator of virginity since it can be torn or stretched for various reasons other than sexual intercourse.

---

184. The following diagram shows restriction sites in E. coli cloning vector pBR322. Find the role of 'X' and 'Y' genes:



(1) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.

(2) The gene 'X' is for protein involved in replication of Plasmid and 'Y' for resistance to antibiotics.

(3) Gene 'X' is responsible for recognition sites and 'Y' is responsible for antibiotic resistance.
(4) The gene 'X' is responsible for resistance to antibiotics and 'Y' for protein involved in the replication of Plasmid.

Correct Answer: (1) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.

Solution:

The vector pBR322 contains the **X** and **Y** genes.
- **Gene X** regulates the copy number of the plasmid DNA.
- **Gene Y** encodes a protein involved in the replication of the plasmid. This ensures that the plasmid can replicate inside the host cell.
Thus, the correct answer is **(1) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.**

Quick Tip

In plasmid vectors like pBR322, genes involved in replication control the number of copies of the plasmid within the host cell.

---

185. Which of the following is not a natural/traditional contraceptive method?

(1) Periodic abstinence
(2) Lactational amenorrhea
(3) Vaults
(4) Coitus interruptus

Correct Answer: (3) Vaults

Solution:

- **Periodic abstinence**, **Lactational amenorrhea**, and **Coitus interruptus** are all traditional methods of contraception.
- **Vaults** refer to a modern contraceptive method involving the insertion of a device and are not considered a natural or traditional method.

Thus, the correct answer is **(3) Vaults**.

Quick Tip

Natural contraceptive methods rely on natural cycles or behavioral strategies, while vaults are a modern, medical contraceptive option.

---

186. Match List I with List II:

	List I		List II
A.	Exophthalmic goiter	I.	Excess secretion of cortisol, moon face & hypergylcemia.
B.	Acromegaly	II.	Hypo-secretion of thyroid hormone and stunted growth.
C.	Cushing's syndrome	III.	Hyper secretion of thyroid hormone & protruding eye balls.
D.	Cretinism	IV.	Excessive secretion of growth hormone.

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-III, B-IV, C-I, D-II

Solution:

- **A. Exophthalmic goiter** is caused by **hyper secretion of thyroid hormone** (III).
- **B. Acromegaly** is caused by **excessive secretion of growth hormone** (IV).
- **C. Cushing's syndrome** is caused by **excess secretion of cortisol, moon face, and hyperglycemia** (I).
- **D. Cretinism** is caused by **hypo-secretion of thyroid hormone and stunted growth** (II).

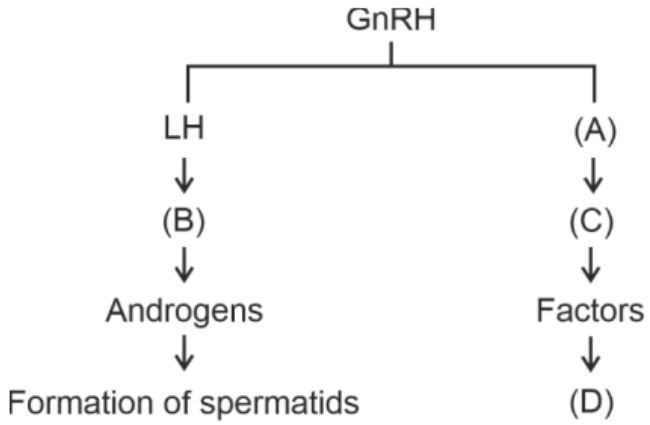
Thus, the correct answer is **(3) A-III, B-IV, C-I, D-II**.

Quick Tip

Endocrine disorders like Cushing's syndrome and acromegaly are caused by excessive hormone secretion, while cretinism is due to undersecretion of thyroid hormone.

---

187. Identify the correct option (A), (B), (C), (D) with respect to spermatogenesis.



(1) ICSH, Interstitial cells, Leydig cells, spermiogenesis.

(2) FSH, Sertoli cells, Leydig cells, spermatogenesis.

(3) ICSH, Leydig cells, Sertoli cells, spermatogenesis.

(4) FSH, Leydig cells, Sertoli cells, spermiogenesis.

Correct Answer: (4) FSH, Leydig cells, Sertoli cells, spermiogenesis.

Solution:

- **FSH (Follicle-stimulating hormone)** acts on the **Sertoli cells** to promote spermatogenesis (the production of sperm).
- **Leydig cells** are responsible for producing testosterone, which supports the process of spermatogenesis.
- **Spermiogenesis** is the final stage of spermatogenesis where spermatids mature into sperm.

Thus, the correct answer is **(4) FSH, Leydig cells, Sertoli cells, spermiogenesis**.

Quick Tip

FSH stimulates Sertoli cells in the seminiferous tubules to support spermatogenesis, while Leydig cells produce testosterone.

188. Given below are two statements:

Statement I: Mitochondria and chloroplasts both are double-membrane bound organelles.

Statement II: Inner membrane of mitochondria is relatively less permeable, as compared to chloroplast.

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 incorrect.

(2) Statement I is correct but Statement II is incorrect.

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

(4) Both Statement I and Statement II are correct.

Correct Answer: (2) Statement I is correct but Statement II is incorrect.

Solution:

- **Statement I** is correct: Both mitochondria and chloroplasts are double-membrane bound organelles, characteristic of eukaryotic cells.

- **Statement II** is incorrect: The inner membrane of the mitochondria is highly impermeable, whereas the inner membrane of the chloroplast is permeable to some molecules due to the presence of specific transporters.

Thus, the correct answer is **(2) Statement I is correct but Statement II is incorrect**.

Quick Tip

Mitochondria and chloroplasts are similar in structure, with double membranes, but their inner membranes have different permeability characteristics.

189. Given below are two statements:

Statement I: Gause's competitive exclusion principle states that two closely related species competing for different resources cannot exist indefinitely.

Statement II: According to Gause's principle, during competition, the inferior will be eliminated. This may be true if resources are limiting.

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

(1) Both Statement I and Statement II are false.

(2) Statement I is true but Statement II is false.

(3) Statement I is false but Statement II is true.

(4) Both Statement I and Statement II are true.

Correct Answer: (3) Statement I is false but Statement II is true.

Solution:

- **Statement I** is false because Gause's competitive exclusion principle states that two species competing for the same resources cannot coexist indefinitely. It is not about different resources.

- **Statement II** is true: In cases of competition for limiting resources, one species may outcompete the other, leading to the elimination of the inferior competitor.

Thus, the correct answer is **(3) Statement I is false but Statement II is true**.

Quick Tip

Gause's competitive exclusion principle emphasizes that species competing for the same resources cannot coexist for long if resources are limiting.

---

190. Regarding catalytic cycle of an enzyme action, select the correct sequential steps:

A. Substrate-enzyme complex formation.

B. Free enzyme ready to bind with another substrate.

C. Release of products.

D. Chemical bonds of the substrate broken.

E. Substrate binding to active site.

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (4) E, A, D, C, B

Solution:

- **E. Substrate binding to the active site** occurs first.

- **A. Substrate-enzyme complex formation** follows after the substrate binds to the active site.

- **D. Chemical bonds of the substrate are broken**, leading to the formation of products.

- **C. Release of products** occurs next.

- **B. Free enzyme is ready to bind with another substrate** to complete the cycle.

Thus, the correct answer is **(4) E, A, D, C, B**.

Quick Tip

The catalytic cycle involves the enzyme-substrate complex formation, substrate breakdown, product release, and enzyme resetting for the next cycle.

---

191. Match List I with List II:

	List I		List II
A.	P wave	I.	Heart muscles are electrically silent.
B.	QRS complex	II.	Depolarisation of ventricles.
C.	T wave	III.	Depolarisation of atria.
D.	T-P gap	IV.	Repolarisation of ventricles.

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (1) A-III, B-II, C-IV, D-I

Solution:

- **A. P wave** corresponds to the depolarisation of the atria (III).

- **B. QRS complex** corresponds to the depolarisation of the ventricles (II).

- **C. T wave** corresponds to the repolarisation of the ventricles (IV).

- **D. T-P gap** represents a period when heart muscles are electrically silent (I).

Thus, the correct answer is **(1) A-III, B-II, C-IV, D-I**.

Quick Tip

Understanding the P wave, QRS complex, and T wave is crucial for interpreting the electrical activity of the heart.

---

192. Match List I with List II:

	List I		List II
A.	RNA polymerase III	I.	snRNPs
B.	Termination of transcription	II.	Promotor
C.	Splicing of Exons	III.	Rho factor
D.	TATA box	IV.	SnRNAs, tRNA

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-IV, B-III, C-I, D-II

Solution:

- **A. RNA polymerase III** synthesizes **snRNAs and tRNA** (IV).

- **B. Termination of transcription** involves the **Rho factor** (III).

- **C. Splicing of exons** is facilitated by **snRNPs** (I).

- **D. TATA box** is involved in the initiation of transcription and serves as a **promoter region** (II).

Thus, the correct answer is **(3) A-IV, B-III, C-I, D-II**.

Quick Tip

The TATA box and RNA polymerase are essential in the initiation of transcription, while snRNPs play a role in splicing.

---

193. Given below are two statements:

Statement I: The cerebral hemispheres are connected by a nerve tract known as corpus callosum.

Statement II: The brain stem consists of the medulla oblongata, pons and cerebrum.

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 incorrect.

(2) Statement I is correct but Statement II is incorrect.

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

(4) Both Statement I and Statement II are correct.

Correct Answer: (2) Statement I is correct but Statement II is incorrect.

Solution:

- **Statement I** is correct: The corpus callosum connects the left and right cerebral hemispheres.

- **Statement II** is incorrect: The brain stem consists of the medulla oblongata, pons, and midbrain, not the cerebrum.

Thus, the correct answer is **(2) Statement I is correct but Statement II is incorrect**.

Quick Tip

The brain stem does not include the cerebrum; it is composed of the medulla oblongata, pons, and midbrain.

---

194. Match List I with List II related to digestive system of cockroach:

	List I		List II
A.	The structures used for storing of food	I.	Gizzard
B.	Ring of 6-8 blind tubules at junction of foregut and midgut.	II.	Gastric Caeca
C.	Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut.	III.	Malpighian tubules
D.	The structures used for grinding the food.	IV.	Crop

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (4) A-IV, B-II, C-III, D-I

Solution:

- **A. Crop** is responsible for storing food (IV).
- **B. Gastric Caeca** are responsible for aiding digestion in the foregut-midgut junction (II).
- **C. Malpighian tubules** are responsible for excretion in the cockroach (III).
- **D. Gizzard** is used for grinding food (I).

Thus, the correct answer is **(4) A-IV, B-II, C-III, D-I**.

Quick Tip

In cockroaches, the digestive system includes specialized structures like the crop for storage and the gizzard for grinding food.

---

195. Match List I with List II:

	List I		List II
A.	Mesozoic Era	I.	Lower invertebrates
B.	Proterozoic Era	II.	Fish & Amphibia
C.	Cenozoic Era	III.	Birds & Reptiles
D.	Paleozoic Era	IV.	Mammals

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (3) A-III, B-I, C-IV, D-II

Solution:

- **A. Mesozoic Era** was dominated by **birds and reptiles** (III).
- **B. Proterozoic Era** featured **lower invertebrates** (I).
- **C. Cenozoic Era** is known for the dominance of **mammals** (IV).
- **D. Paleozoic Era** was characterized by **fish and amphibians** (II).

Thus, the correct answer is **(3) A-III, B-I, C-IV, D-II**.

Quick Tip

The geologic eras are marked by distinct groups of organisms, with mammals dominating the Cenozoic era, and fish and amphibians in the Paleozoic.

---

196. Given below are two statements: Statement I: Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced. Statement II: Both bone marrow and thymus provide microenvironments for the development and maturation of T-lymphocytes. 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 incorrect.

(2) Statement I is correct but Statement II is incorrect.

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

(4) Both Statement I and Statement II are correct.

Correct Answer: (4) Both Statement I and Statement II are correct.

Solution:

- **Statement I** is correct: The bone marrow is indeed the primary site where all blood cells, including lymphocytes, are produced.
- **Statement II** is correct: Both the bone marrow and thymus provide microenvironments for the development and maturation of T-lymphocytes, with the thymus being the primary site for T-cell maturation.

Thus, the correct answer is **(4) Both Statement I and Statement II are correct.**

Quick Tip

The bone marrow produces blood cells, including lymphocytes, while the thymus is key for T-lymphocyte maturation.

---

197. Match List I with List II:

	List I		List II
A.	Unicellular glandular epithelium	I.	Salivary glands
B.	Compound epithelium	II.	Pancreas
C.	Multicellular glandular epithelium	III.	Goblet cells of alimentary canal
D.	Endocrine glandular epithelium	IV.	Moist surface of buccal cavity

Choose the correct answer from the options given below:

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

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

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

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

Correct Answer: (2) A-III, B-IV, C-I, D-II

Solution:

- **A. Unicellular glandular epithelium** refers to **Goblet cells of the alimentary canal** (III).
- **B. Compound epithelium** is found in the **moist surface of the buccal cavity** (IV).
- **C. Multicellular glandular epithelium** includes **salivary glands** (I).
- **D. Endocrine glandular epithelium** is found in the **pancreas** (II).

Thus, the correct answer is **(2) A-III, B-IV, C-I, D-II**.

Quick Tip

Unicellular glands like goblet cells are found in the alimentary canal, while multicellular glands include salivary and endocrine glands like the pancreas.

198. Choose the correct statement given below regarding juxta medullary nephron:

(1) Renal corpuscle of juxta medullary nephron lies in the outer portion of the renal medulla.

(2) Loop of Henle of juxta medullary nephron runs deep into medulla.

(3) Juxta medullary nephrons outnumber the cortical nephrons.

(4) Juxta medullary nephrons are located in the columns of Bertini.

Correct Answer: (2) Loop of Henle of juxta medullary nephron runs deep into medulla.

Solution:

- **Statement 1** is incorrect because the renal corpuscle of juxta medullary nephrons lies in the cortex, not the outer portion of the renal medulla.
- **Statement 2** is correct: The Loop of Henle of juxta medullary nephrons extends deep into the medulla, which helps in water conservation.
- **Statement 3** is incorrect because cortical nephrons outnumber juxta medullary nephrons.
- **Statement 4** is incorrect because juxta medullary nephrons are not located in the columns of Bertini.

Thus, the correct answer is **(2) Loop of Henle of juxta medullary nephron runs deep into medulla.**

Quick Tip

Juxta medullary nephrons have long loops of Henle that extend into the medulla, crucial for water reabsorption and urine concentration.

---

199. As per ABO blood grouping system, the blood group of father is B+, mother is A+ and child is O+. Their respective genotype can be:

A. $I^Bi/I^Ai/ii$

B. $I^BI^B/I^AI^A/ii$

C. $I^AI^B/iI^A/I^Bi$

D. $I^Ai/I^Bi/I^Ai$

E. $iI^B/iI^A/I^AI^B$

(1) B only

(2) C & B only

(3) D & E only

(4) A only

Correct Answer: (4) A only

Solution:

- **Father (B+)** must have the genotype **IBi** because he passed the O allele to the child.
- **Mother (A+)** must have the genotype **IAi** because she passed the O allele to the child.
- The child's genotype must be **ii**, as they inherited the O allele from both parents.

Thus, the correct answer is **(4) A only**.

Quick Tip

For O+ blood group, both parents must carry an O allele (genotype IAi or IBi).

---

200. The following are the statements about non-chordates:

A. Pharynx is perforated by gill slits.

B. Notochord is absent.

C. Central nervous system is dorsal.

D. Heart is dorsal if present.

E. Post anal tail is absent.

Choose the most appropriate answer from the options given below:

(1) A, B & D only

(2) B, D & E only

(3) B, C & D only

(4) A & C only

Correct Answer: (2) B, D & E only

Solution:

- **Statement A** is incorrect because pharyngeal gill slits are not found in all non-chordates, but only in chordates.
- **Statement B** is correct: Non-chordates lack a notochord.

- **Statement C** is correct: In non-chordates, the central nervous system is dorsal.

- **Statement D** is correct: In many non-chordates, the heart, if present, is dorsal.

- **Statement E** is correct: Many non-chordates lack a post-anal tail.

Thus, the correct answer is **(2) B, D & E only**.

Quick Tip

Non-chordates lack a notochord, have a dorsal nervous system, and may have a dorsal heart.
