

NEET 2024 R5 Zoology Question Paper with Solutions

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

Assertion A: FSH acts upon ovarian follicles in females and Leydig cells in males.

Reason R: Growing ovarian follicles secrete estrogen in females while interstitial cells secrete androgen in male human beings.

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: Step 1: Understanding FSH Action

- FSH (Follicle-Stimulating Hormone) acts on ovarian follicles in females to stimulate their growth and maturation.
- However, in males, FSH stimulates the Sertoli cells (not Leydig cells) to support spermatogenesis.

Step 2: Understanding Estrogen and Androgen Secretion

- Ovarian follicles secrete estrogen, which is correct.
- Leydig cells secrete testosterone (androgen) in males, which is also correct.

Conclusion: Since A states that FSH acts on Leydig cells (which is incorrect), the correct answer is (3).

Quick Tip

FSH acts on Sertoli cells, while LH (Luteinizing Hormone) acts on Leydig cells to stimulate testosterone production.

2. Match List I with List II

List I	List II
<i>A.Lipase</i>	<i>I.Peptidebond</i>
<i>B.Nuclease</i>	<i>II.Esterbond</i>
<i>C.Protease</i>	<i>III.Glycosidicbond</i>
<i>D.Amylase</i>	<i>IV.Phosphodiesterbond</i>

(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:

Understanding the Enzyme Functions :

- Lipase hydrolyzes fats, breaking down ester bonds in lipids.
- Nuclease breaks phosphodiester bonds in nucleic acids.
- Protease hydrolyzes peptide bonds in proteins.
- Amylase breaks glycosidic bonds in carbohydrates.

Conclusion: The correct option is (2).

Quick Tip

Enzymes catalyze specific biochemical reactions by targeting specific bonds in macromolecules.

153. 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:

Cardiac Conduction Pathway

- **SA node (Sinoatrial node):** Acts as the **pacemaker** of the heart, initiating the heartbeat.
- **AV node (Atrioventricular node):** Delays the electrical impulse before transmitting it to the ventricles.
- **AV bundle (Bundle of His):** Conducts impulses from the atria to the ventricles.
- **Bundle branches:** Transmit the impulse to both ventricles.
- **Purkinje fibers:** Distribute the impulse throughout the ventricles, leading to **ventricular contraction**.

Conclusion:

The correct sequence is $E \rightarrow C \rightarrow A \rightarrow D \rightarrow B$, corresponding to option (4).

Quick Tip

The SA node is the natural pacemaker of the heart, setting the rhythm of cardiac contractions.

4. 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

(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: Understanding Brain Regions

- Pons connects different brain regions, facilitating communication.
- Hypothalamus contains neurosecretory cells regulating homeostasis.
- Medulla oblongata controls involuntary functions such as respiration and digestion.
- Cerebellum coordinates posture, balance, and fine motor movements.

Conclusion: The correct option is (1).

Quick Tip

The cerebellum is essential for motor coordination, while the medulla controls vital autonomic functions.

5. 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: Understanding Hardy-Weinberg Equilibrium

- Hardy-Weinberg equilibrium states that allele frequencies in a population remain constant unless disturbed by evolutionary forces.
- Factors affecting equilibrium include genetic drift, gene migration, mutation, selection, and recombination.

Conclusion: A constant gene pool maintains equilibrium, so the correct option is (3).

Quick Tip

For a population to be in Hardy-Weinberg equilibrium, it must have random mating, large population size, and no mutation, selection, or migration.

6. 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: Understanding Cockroach Anatomy

- Anal cerci are sensory appendages present on the 10th segment in both male and female cockroaches.

- They detect vibrations and help in reflexive responses to threats.

Conclusion: The correct answer is (1).

Quick Tip

Anal cerci are sensitive to vibrations and function as sensory organs in cockroaches.

7. 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:

Step 1: Understanding Lung Capacities and Their Components

- Expiratory capacity (A-II): The total volume of air that can be exhaled after normal inspiration.

$$\text{Expiratory capacity} = \text{Tidal volume} + \text{Expiratory reserve volume}$$

- Functional residual capacity (B-IV): The volume of air remaining in the lungs after normal expiration.

$$\text{Functional residual capacity} = \text{Expiratory reserve volume} + \text{Residual volume}$$

- Vital capacity (C-I): The maximum volume of air a person can exhale after a deep inspiration.

$$\text{Vital capacity} = \text{Expiratory reserve volume} + \text{Tidal volume} + \text{Inspiratory reserve volume}$$

- Inspiratory capacity (D-III): The maximum volume of air that can be inhaled after a normal expiration.

$$\text{Inspiratory capacity} = \text{Tidal volume} + \text{Inspiratory reserve volume}$$

Step 2: Matching the correct pairs

$A \rightarrow II$ (Tidal volume + Expiratory reserve volume)

$B \rightarrow IV$ (Expiratory reserve volume + Residual volume)

$C \rightarrow I$ (Expiratory reserve volume + Tidal volume + Inspiratory reserve volume)

$D \rightarrow III$ (Tidal volume + Inspiratory reserve volume)

Conclusion: The correct answer is (4) **A-II, B-IV, C-I, D-III**.

Quick Tip

Lung capacities are combinations of different lung volumes. Expiratory capacity is the sum of tidal volume and expiratory reserve volume, while functional residual capacity includes the residual volume. Vital capacity is the total air exhaled after deep inspiration, and inspiratory capacity is the sum of tidal volume and inspiratory reserve volume.

8. The flippers of Penguins and Dolphins are an example of:

- (1) Natural selection
- (2) Convergent evolution
- (3) Divergent evolution
- (4) Adaptive radiation

Correct Answer: (2) Convergent evolution

Solution: Understanding Evolutionary Trends

- Convergent evolution occurs when unrelated species evolve similar traits due to adaptation to similar environments.
- Flippers of Penguins (birds) and Dolphins (mammals) evolved independently for swimming, despite their different ancestral origins.

Conclusion: Since Penguins and Dolphins evolved similar features independently, the correct answer is (2).

Quick Tip

Convergent evolution results in analogous structures, while divergent evolution results in homologous structures.

9. Match List I with List II:

List I		List II
A. α -1 antitrypsin		I. Cotton bollworm
B. Cry IAb		II. ADA deficiency
C. Cry IAc		III. Emphysema
D. Enzyme replacement therapy		IV. Corn borer

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:

Step 1: Understanding the Functions of the Given Terms

- α -1 antitrypsin (A-III): It is a protein that protects lung tissue from damage and its deficiency leads to **emphysema**.
- Cry IAb (B-IV): This gene from **Bacillus thuringiensis (Bt)** produces a toxin effective against the **corn borer**.
- Cry IAc (C-I): This Bt toxin specifically targets **cotton bollworm**.
- Enzyme replacement therapy (D-II): This therapy is used to treat **ADA deficiency**, a disorder affecting the immune system.

Step 2: Matching the Correct Pairs

$A \rightarrow III$ (Emphysema)

$B \rightarrow IV$ (Corn borer)

$C \rightarrow I$ (Cotton bollworm)

$D \rightarrow II$ (ADA deficiency)

Conclusion: The correct answer is **(2) A-III, B-IV, C-I, D-II**.

Quick Tip

α -1 antitrypsin prevents lung damage; Cry IAb targets corn borer, and Cry IAc targets cotton bollworm. Enzyme replacement therapy is a treatment for ADA deficiency.

10. 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

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

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

Solution: Understanding Chromosomal Disorders

- Down's syndrome results from trisomy of the 21st chromosome.
- α -Thalassemia is associated with deletions in the 16th chromosome, affecting hemoglobin production.
- β -Thalassemia is linked to mutations in the X chromosome, causing anemia.
- Klinefelter's syndrome (XXY condition) occurs due to an extra X chromosome in males.

Conclusion: The correct match is (2).

Quick Tip

Genetic disorders can be caused by trisomy (e.g., Down's syndrome) or chromosomal mutations affecting specific gene loci.

161. Given below are two statements:

Statement I: The presence or absence of hymen is not a reliable indicator of virginity.

Statement II: 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: Understanding the Role of Hymen

- The hymen can be torn due to several activities, including sports, cycling, or medical examinations, apart from sexual intercourse.
- Thus, it is not a reliable indicator of virginity.

Conclusion: The correct option is (2).

Quick Tip

Virginity is a social concept and cannot be medically determined by the presence or absence of the hymen.

162. Match List I with List II:

List I	List II
<i>A.Commoncold</i>	<i>I.Plasmodium</i>
<i>B.Haemozoin</i>	<i>II.Typhoid</i>
<i>C.Widaltest</i>	<i>III.Rhinoviruses</i>
<i>D.Allergy</i>	<i>IV.Dustmites</i>

- (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: Understanding Disease and Diagnostic Associations

- Common cold is caused by rhinoviruses.
- Haemozoin is a byproduct of Plasmodium, the parasite responsible for malaria.
- Widal test is used for diagnosing typhoid fever.
- Allergies can be triggered by dust mites and other allergens.

Conclusion: The correct match is (2).

Quick Tip

Plasmodium causes malaria, and its breakdown of hemoglobin results in haemozoin, which causes fever recurrence.

13. 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:

Structure of the Fallopian Tube

- The **Fallopian tube** consists of four distinct regions:
 1. **Infundibulum:** A funnel-shaped opening near the ovary.
 2. **Ampulla:** The widest section where **fertilization** occurs.
 3. **Isthmus:** A narrow segment connecting to the uterus.
 4. **Interstitial (Intramural) part:** The portion passing through the **uterine wall**.
- The **Uterine Fundus** is **not** a part of the Fallopian tube; instead, it is the **topmost portion of the uterus**.

Conclusion:

The correct answer is (4).

Quick Tip

Fertilization occurs in the ampulla of the Fallopian tube, making it a crucial structure in reproduction.

14. 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: Understanding Cell Cycle Phases

- Gap 1 phase (G1): The first growth phase, preparing for DNA replication.
- Synthesis phase (S): DNA replication occurs.
- Gap 2 phase (G2): Preparation for mitosis.
- Karyokinesis: Nuclear division (mitosis).
- Cytokinesis: Division of cytoplasm leading to two daughter cells.

Conclusion: The correct sequence is $E \rightarrow C \rightarrow A \rightarrow D \rightarrow B$.

Quick Tip

The cell cycle consists of interphase (G1, S, G2) followed by mitotic phase (M), which includes karyokinesis and cytokinesis.

15. Match List I with List II:

List I	List II
<i>A.Axoneme</i>	<i>I.Centriole</i>
<i>B.Cartwheelpattern</i>	<i>II.Ciliaandflagella</i>
<i>C.Crista</i>	<i>III.Chromosome</i>
<i>D.Satellite</i>	<i>IV.Mitochondria</i>

(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: Understanding the Cellular Structures

- Axoneme is the structural core of cilia and flagella.
- Cartwheel pattern is seen in centrioles during cell division.
- Crista are folds in the inner membrane of mitochondria.
- Satellite regions are part of chromosomes involved in rRNA synthesis.

Conclusion: The correct match is (3).

Quick Tip

Cilia and flagella are supported by axonemes, while mitochondria have crista to increase surface area for ATP synthesis.

16. Given below are two statements:

Assertion A: Breast-feeding during the initial period of infant growth is recommended by doctors for bringing up 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: Understanding the Role of Breastfeeding

- Colostrum, the first milk produced by the mother, is rich in immunoglobulins (IgA) that help protect the newborn.

- Breastfeeding also provides essential nutrients for growth and brain development.

Conclusion: Since colostrum helps in immunity development, it supports the assertion.

Hence, (4) is correct.

Quick Tip

Colostrum is crucial for newborn immunity, providing passive immunity against infections.

17. 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: Understanding the Sub Phases of Prophase I

- Leptotene: Chromosomes appear as thin threads.

- Zygotene: Synaptonemal complex formation occurs.

- Pachytene: Recombination nodules appear, crossing over occurs.

- Diakinesis: Terminalisation of chiasmata completes, preparing for metaphase.

Conclusion: The correct match is (2).

Quick Tip

Prophase I is the longest meiotic phase, crucial for genetic variation due to recombination.

18. Match List I with List II:

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

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: Understanding Types of Joints

- Fibrous Joints: Found in the skull, with no movement.
- Cartilaginous Joints: Found between vertebrae, allowing limited movement.
- Hinge Joints: Present in knees, allowing movement in one plane.
- Ball and Socket Joints: Shoulder and hip joints allow multi-directional movement.

Conclusion: The correct match is (3).

Quick Tip

Joints allow mobility while maintaining structural integrity; different types provide different movement ranges.

19. 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: Conditions for Oxyhaemoglobin Formation

- High pO₂ promotes oxygen binding with haemoglobin.
- Low H⁺ concentration prevents haemoglobin from releasing oxygen.
- Low pCO₂ prevents the Bohr effect, which enhances oxygen loading.

Conclusion: (1) is correct.

Quick Tip

Oxygen binds to haemoglobin in high pO₂ environments (lungs) and is released in low pO₂ tissues.

20. 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: Understanding Contraceptive Methods

- Periodic abstinence: Avoiding intercourse during the fertile window.
- Lactational amenorrhea: Temporary infertility during breastfeeding.
- Coitus interruptus: Withdrawal before ejaculation.
- Vaults: Barrier method, not natural.

Conclusion: (3) is correct.

Quick Tip

Natural contraceptive methods rely on physiological changes and awareness, while barrier methods like vaults are artificial.

171. 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: Understanding Autoimmune Disorders

- Myasthenia gravis: An autoimmune disorder affecting neuromuscular function.
- Rheumatoid arthritis: An autoimmune disease causing joint inflammation.
- Systemic Lupus Erythematosus (SLE): A systemic autoimmune disease.
- Gout: A metabolic disorder, not autoimmune.
- Muscular dystrophy: A genetic disorder, not autoimmune.

Conclusion: The correct answer is (1).

Quick Tip

Autoimmune disorders occur when the immune system mistakenly attacks the body's own cells.

22. The “Ti plasmid” of *Agrobacterium tumefaciens* stands for

- (1) Tumor independent plasmid
- (2) Tumor inducing plasmid
- (3) Temperature independent plasmid
- (4) Tumour inhibiting plasmid

Correct Answer: (2) Tumor inducing plasmid

Solution: Understanding Ti Plasmid

- Agrobacterium tumefaciens is a bacterium that causes crown gall disease in plants.
- The Ti plasmid (Tumor-inducing plasmid) carries genes responsible for transforming plant cells.
- It is widely used in genetic engineering to transfer foreign genes into plants.

Conclusion: The correct answer is (2).

Quick Tip

Ti plasmid is an essential tool in plant biotechnology, enabling genetic modifications in crops.

23. Which one is the correct product of DNA-dependent RNA polymerase to the given template?

3'-TACATGGCAAATATCCATTCA-5'

- (1) 5'-AUGUAAAGUUUAUAGGUAAGU-3'
- (2) 5'-AUGUACCGUUUAUAGGGAAGU-3'
- (3) 5'-ATGTACCGTTTATAGGTAAGT-3'
- (4) 5'-AUGUACCGUUUAUAGGUAAGU-3'

Correct Answer: (4) 5'-AUGUACCGUUUAUAGGUAAGU-3'

Solution: Step 1: Understanding Transcription

- The given DNA template is 3' to 5', and RNA polymerase synthesizes mRNA in the 5' to 3' direction.
- Base pairing rules for transcription:
 - A (Adenine) → U (Uracil)
 - T (Thymine) → A (Adenine)
 - C (Cytosine) → G (Guanine)
 - G (Guanine) → C (Cytosine)

Step 2: Complementary mRNA Formation

DNA template: 3'-TACATGGCAAATATCCATTCA-5'

mRNA strand: 5'-AUGUACCGUUUAUAGGUAAGU-3'

Conclusion: The correct answer is (4).

Quick Tip

Transcription produces mRNA, which is complementary to the DNA template and replaces thymine (T) with uracil (U).

24. 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: Understanding Bio-reactors

- Bio-reactors are used for large-scale production of microbial cultures.
- Small-scale cultures are grown in flasks or test tubes rather than in bio-reactors.
- Bio-reactors provide controlled temperature, pH, aeration, and mixing to maximize product yield.

Conclusion: The correct answer is (2).

Quick Tip

Bio-reactors are essential in industrial biotechnology for large-scale microbial culture and fermentation processes.

25. Match List I with List II

List I (Drug)	List II (Source)
A.Cocaine	I.Effective sedative in surgery
B.Heroin	II.Cannabis sativa
C.Morphine	III.Erythroxylum
D.Marijuana	IV.Papaver somniferum

(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: - Cocaine is derived from **Erythroxylum** plant.

- Heroin is synthesized from morphine, which is obtained from **Papaver somniferum**.

- Morphine is an effective sedative used in surgery.

- Marijuana comes from Cannabis sativa.

Conclusion: The correct answer is (3).

Quick Tip

Drugs derived from plants have significant medicinal and recreational impacts.

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

(1) Testosterone

(2) Progesterone

(3) Glucagon

(4) Cortisol

Correct Answer: (3) Glucagon

Solution: - Steroid hormones include testosterone, progesterone, and cortisol.

- Glucagon is a peptide hormone, not a steroid hormone.

- It is produced by pancreatic alpha cells and regulates blood glucose.

Conclusion: The correct answer is (3).

Quick Tip

Steroid hormones are derived from cholesterol and regulate metabolism, inflammation, and reproductive functions.

27. Match List I with List II

List I (Contraceptive Method)	List II (Example)
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

(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: - Non-medicated IUD: **Lippes loop**.

- Copper releasing IUD: **Multiload 375**.

- Hormone releasing IUD: **LNG-20**.

- Implants: **Progestogens**.

Conclusion: The correct answer is (3).

Quick Tip

IUDs (Intrauterine Devices) are effective birth control methods with varying mechanisms.

28. 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.

- (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:

Understanding Nephron Structure and Function

- The **descending limb of the loop of Henle** is **permeable to water** but **partially permeable to electrolytes**, making the given statement **incorrect**.
- The **proximal convoluted tubule (PCT)** is lined with **simple cuboidal brush border epithelium**, not **columnar epithelium**, which makes the given statement **incorrect**.

Conclusion:

The correct answer is (1).

Quick Tip

Nephrons regulate water and electrolyte balance through selective permeability in different segments.

29. 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: - Homo habilis (Earliest tool-user, appeared 2.1 million years ago).

- Homo erectus (More advanced, first to use fire).

- Homo neanderthalensis (Coexisted with early Homo sapiens, adapted to cold).

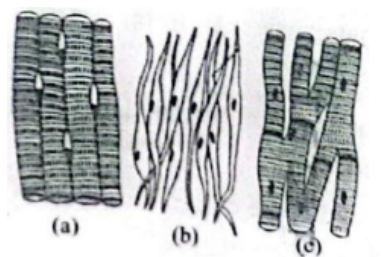
- Homo sapiens (Modern humans, dominant species today).

Conclusion: The correct sequence is A-D-C-B.

Quick Tip

Human evolution involved gradual brain development, tool usage, and social complexity.

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



(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) Skeletal - Triceps, Smooth - Stomach, Cardiac - Heart

- Solution:** - Skeletal muscles: Voluntary, attached to bones (e.g., triceps, biceps).
- Smooth muscles: Involuntary, found in digestive organs (e.g., stomach, intestine).
- Cardiac muscles: Specialized involuntary muscles in the heart.

Conclusion: The correct option is (1).

Quick Tip

Muscle types differ in function: Skeletal (voluntary), Smooth (involuntary), and Cardiac (automatic rhythmic contractions).

31. 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:

- Pleurobrachia: Ctenophora, known as comb jellies.
- Radula: Mollusca, rasping organ used for feeding.
- Stomochord: Hemichordata, structure similar to notochord.
- Air bladder: Osteichthyes (bony fish), used for buoyancy.

Conclusion: The correct option is (1).

Quick Tip

Animal classification is based on body structure, function, and evolutionary lineage.

32. Match List I with List II

List I (Fish Species)	List II (Common Name)
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: - Pterophyllum (Angel fish) is a popular aquarium fish.

- Myxine (Hag fish) is a jawless fish known for its slime production.
- Pristis (Saw fish) has a long, saw-like rostrum.
- Exocoetus (Flying fish) can glide above water using wing-like fins.

Conclusion: The correct option is (1).

Quick Tip

Different fish species have unique adaptations for survival, such as gliding, slime production, and specialized feeding structures.

33. 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:

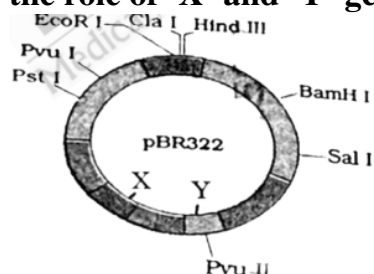
- Typhoid is caused by the bacterium *Salmonella typhi*.
- Leishmaniasis is caused by the protozoan *Leishmania*.
- Ringworm is a fungal infection affecting the skin.
- Filariasis is caused by a nematode (*Wuchereria bancrofti*).

Conclusion: The correct option is (1).

Quick Tip

Different types of pathogens (bacteria, protozoa, fungi, and nematodes) cause various infectious diseases in humans.

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



(1) The gene 'X' controls the copy number of the linked DNA, and 'Y' codes for a protein

involved in plasmid replication.

(2) The gene 'X' codes for a protein involved in plasmid replication, and 'Y' provides antibiotic resistance.

(3) Gene 'X' is responsible for recognition sites, and 'Y' is responsible for antibiotic resistance.

(4) The gene 'X' provides antibiotic resistance, and 'Y' codes for a protein involved in plasmid replication.

Correct Answer: (1) The gene 'X' controls the copy number of the linked DNA, and 'Y' codes for a protein involved in plasmid replication.

Solution: - Gene 'X': Regulates plasmid copy number, crucial for cloning efficiency.

- Gene 'Y': Produces a protein essential for plasmid replication.

Conclusion: The correct option is (1).

Quick Tip

Plasmid vectors such as pBR322 play a critical role in genetic engineering by allowing gene insertion and controlled replication.

35. 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: - Annelids (e.g., earthworms) have a true coelom (coelomates).

- Poriferans (sponges) lack body cavities and are acoelomates.

- Aschelminthes (roundworms) have a pseudocoelom, not an acoelom.
- Platyhelminthes (flatworms) are also acoelomates, not pseudocoelomates.

Conclusion: The correct statement is (A: Annelids are true coelomates).

Quick Tip

Coelom classification: Coelomates (Annelids), Pseudocoelomates (Aschelminthes), Acoelomates (Platyhelminthes, Porifera).

Section B

36. 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:

Juxta Medullary and Cortical Nephrons: Key Differences

- **Juxta medullary nephrons** have their **renal corpuscle** positioned deep within the **renal cortex**.
- Their **Loop of Henle** extends significantly into the **renal medulla**, enabling **enhanced water reabsorption**.
- **Cortical nephrons** are **more abundant** than juxta medullary nephrons.
- The **Columns of Bertini** do not house nephrons; they primarily serve as **support structures** for the **renal pyramids**.

Conclusion:

The correct answer is (2).

Quick Tip

Juxta medullary nephrons play a crucial role in urine concentration by maintaining the osmotic gradient in the medulla.

37. 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 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:

- Bone marrow is the primary lymphoid organ responsible for blood cell formation, including lymphocytes.
- T-lymphocytes mature in the thymus, which provides the necessary microenvironment for their differentiation.
- Both bone marrow and thymus play key roles in immune system development.

Conclusion: The correct option is (4).

Quick Tip

Bone marrow is the primary site of hematopoiesis, while the thymus is essential for T-cell maturation.

38. Match List I with List II related to the 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:

- Crop (A-IV): Stores food before digestion.
- Gastric Caeca (B-II): Secrete digestive enzymes.
- Malpighian Tubules (C-III): Excretory structures involved in osmoregulation.
- Gizzard (D-I): Helps in mechanical grinding of food.

Conclusion: The correct option is (4).

Quick Tip

Cockroach digestive system includes the foregut (crop and gizzard), midgut (gastric caeca), and hindgut (Malpighian tubules for excretion).

39. 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:

- P wave represents atrial depolarization, indicating contraction of the atria.
- QRS complex represents ventricular depolarization, indicating contraction of the ventricles.
- T wave represents ventricular repolarization, meaning ventricles relax.
- T-P gap is the period when the heart is electrically silent before the next cycle.

Conclusion: The correct option is (1).

Quick Tip

ECG is an important tool in cardiology, where each wave corresponds to specific electrical events in the heart.

40. 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^{B_i}/I^{A_i}

(B) $I^B I^B / I^{A_i}$

(C) $I^A B / I^A I^B$

(D) $I^{A_i} / I^B I^A$

(E) $ii / I^A I^B$

Choose the most appropriate answer from the options given below :

(1) B only

(2) C & B only

(3) D & E only

(4) A only

Correct Answer: (4) A only

Solution:

- Since the child has O+ blood type, both parents must have one recessive 'i' allele.
- Possible parental genotypes are:
- Father (B+): I^{B_i}

- Mother (A+): $I^A i$

- This allows the child to inherit 'i' from both parents, resulting in O+ blood type.

Conclusion: The correct option is (4).

Quick Tip

The ABO blood group system follows Mendelian inheritance, where 'A' and 'B' are dominant over 'O'.

41. Match List I with List II:

List I		List II
A. RNA polymerase III		I. snRNPs
B. Termination of transcription		II. Promoter
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:

Step 1: Understanding the Functions of the Given Terms

- RNA polymerase III (A-IV): Responsible for the transcription of **small nuclear RNAs (snRNAs)** and **transfer RNAs (tRNA)**.

- Termination of transcription (B-III): The **Rho factor** plays a role in the termination of transcription in prokaryotic cells.

- Splicing of Exons (C-I): Small nuclear ribonucleoproteins (**snRNPs**) participate in **RNA splicing**, removing introns and joining exons.

- TATA box (D-II): A conserved **promoter** sequence that helps in the initiation of transcription.

Step 2: Matching the Correct Pairs

$A \rightarrow IV$ (SnRNAs, tRNA)

$B \rightarrow III$ (Rho factor)

$C \rightarrow I$ (snRNPs)

$D \rightarrow II$ (Promoter)

Conclusion: The correct answer is **(3) A-IV, B-III, C-I, D-II**.

Quick Tip

RNA polymerase III transcribes snRNAs and tRNA, the Rho factor terminates transcription, snRNPs assist in splicing, and the TATA box is a crucial promoter sequence for gene expression.

42. Given below are two statements:

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

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

In the light of the above statements, choose the mis 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:

- Mitochondria and chloroplasts are double-membrane bound organelles, confirming Statement I is correct.
- However, the inner membrane of chloroplasts is less permeable than mitochondria, making Statement II incorrect.
- The mitochondrial inner membrane is involved in ATP synthesis and has more selective

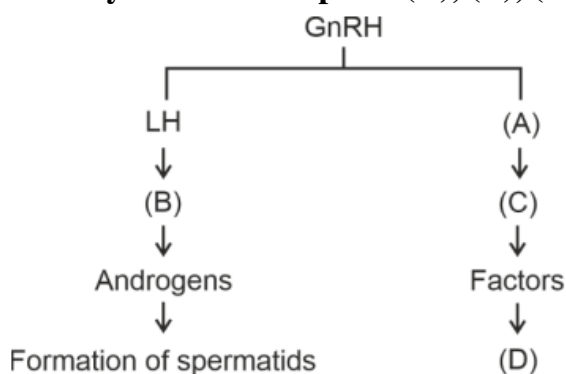
transporters than chloroplasts.

Conclusion: The correct option is (2).

Quick Tip

Mitochondria are the powerhouse of the cell, while chloroplasts are responsible for photosynthesis. Both have their own DNA.

43. 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) stimulates Sertoli cells to support spermatogenesis.

- Leydig cells, stimulated by ICSH (Interstitial Cell-Stimulating Hormone), produce testosterone for sperm development.

- Spermiogenesis is the final transformation of spermatids into mature spermatozoa.

Conclusion: The correct option is (4).

Quick Tip

FSH plays a crucial role in sperm development, while Leydig cells support testosterone production.

44. 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: - Non-chordates lack a notochord and post-anal tail (Statement B, E).

- If a heart is present, it is dorsal (Statement D).

- Gill slits and dorsal CNS are characteristics of chordates, so A and C are incorrect.

Conclusion: The correct option is (2).

Quick Tip

Non-chordates lack a notochord, post-anal tail, and have a ventral nerve cord instead of a dorsal one.

45. 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: - Gause's principle states that two species competing for the same resources cannot coexist indefinitely, but if they utilize different resources, coexistence is possible.

- Statement I is false, as competition occurs when species compete for same resources.
- Statement II is true, as the inferior competitor is eliminated when resources are limited.

Conclusion: The correct option is (3).

Quick Tip

Competitive exclusion principle states that no two species can occupy the same ecological niche for long.

46. 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: - Step 1 (E): The substrate binds to the active site of the enzyme.

- Step 2 (A): This forms a substrate-enzyme complex.
- Step 3 (D): The enzyme catalyzes the breakage of chemical bonds in the substrate.
- Step 4 (C): The products are released from the enzyme.
- Step 5 (B): The enzyme is free to bind another substrate.

Conclusion: The correct sequence is $E \rightarrow A \rightarrow D \rightarrow C \rightarrow B$, option (4).

Quick Tip

Enzymes work by lowering the activation energy of a reaction and remain unchanged after the process.

47. Given below are two statements:

Statement I: The cerebral hemispheres are connected by 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: - The corpus callosum is a large nerve fiber bundle that connects the two cerebral hemispheres, facilitating communication between them. Statement I is correct.

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

Conclusion: The correct option is (2).

Quick Tip

The brainstem controls vital functions such as breathing, heart rate, and reflexes, while the cerebrum handles higher cognitive functions.

48. Match List I with List II:

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

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: - Exophthalmic goiter (Graves' disease) results from hypersecretion of thyroid hormones, leading to protruding eyeballs.

- Acromegaly occurs due to excess growth hormone secretion in adulthood, causing enlarged extremities.

- Cushing's syndrome is caused by excess cortisol secretion, leading to moon face and hyperglycemia.

- Cretinism is due to thyroid hormone deficiency in childhood, causing stunted growth and mental retardation.

Conclusion: The correct option is (3).

Quick Tip

Hormonal imbalances can lead to distinct disorders; thyroid hormones affect metabolism, while cortisol and growth hormone regulate stress and growth.

49. 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: - Unicellular glandular epithelium consists of goblet cells found in the alimentary canal.

- Compound epithelium forms moist surfaces like the buccal cavity and provides protection.
- Multicellular glandular epithelium is found in salivary glands for secretion.
- Endocrine glandular epithelium includes the pancreas, which secretes hormones.

Conclusion: The correct option is (2).

Quick Tip

Glandular epithelium plays a major role in secretion; unicellular glands release mucus, whereas multicellular glands produce enzymes and hormones.

50. 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:

Step 1: Understanding Geological Eras and Their Characteristic Fauna

- Mesozoic Era (A-III): Known as the "Age of Reptiles," it saw the dominance of **birds and**

reptiles.

- Proterozoic Era (B-I): Marked by the emergence of **lower invertebrates** such as early multicellular life forms.
- Cenozoic Era (C-IV): Often referred to as the "Age of Mammals," characterized by the evolution and diversification of **mammals**.
- Paleozoic Era (D-II): Notable for the evolution of **fish and amphibians**, which thrived in aquatic environments.

Step 2: Matching the Correct Pairs

$A \rightarrow III$ (Birds & Reptiles)

$B \rightarrow I$ (Lower invertebrates)

$C \rightarrow IV$ (Mammals)

$D \rightarrow II$ (Fish & Amphibia)

Conclusion: The correct answer is **(3) A-III, B-I, C-IV, D-II**.

Quick Tip

The geological time scale classifies Earth's history into different eras. The **Proterozoic Era** saw early multicellular life, the **Paleozoic Era** was dominated by fish and amphibians, the **Mesozoic Era** was the age of reptiles and birds, and the **Cenozoic Era** saw the rise of mammals.