

NEET UG 2024 Zoology Q4 Question Paper with Solutions

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

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

**Solution:** Pleurobrachia is a member of the phylum Ctenophora, known for its characteristic comb-like cilia used for propulsion (A-II). The radula is an organ found in mollusks, used for feeding by scraping or cutting food (B-I). The stomochord is a structure in Hemichordata, often confused with the chordate notochord, but it differs in function and structure (C-IV). The air bladder, also known as the swim bladder, is a gas-filled organ that helps bony fish (Osteichthyes) regulate buoyancy (D-III). This question evaluates your understanding of biological classification and the anatomical features of different animal groups.

**Quick Tip**

Understanding the unique structures within animal phyla can help identify evolutionary relationships and adaptive functions.

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**152. 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) C-E-D-A-B
- (2) E-B-D-A-C
- (3) B-D-E-A-C
- (4) E-C-A-D-B

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

**Solution:** The sequence of stages in the cell cycle starts with the Gap 1 phase (E), where the cell grows and prepares for DNA replication. This is followed by the Synthesis phase (C), where DNA replication occurs. Next, the cell enters the Gap 2 phase (A), where further preparation for mitosis takes place. Karyokinesis (D), or nuclear division, follows, and finally, Cytokinesis (B) divides the cytoplasm to form two daughter cells. This understanding of the cell cycle is fundamental for studying cell division, its regulation, and its implications in diseases like cancer.

**Quick Tip**

Disruptions in the normal progression of the cell cycle can lead to uncontrolled cell growth, often observed in cancer.

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**153. 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-II, B-IV, C-III, D-I
- (2) A-I, B-III, C-II, D-IV
- (3) A-III, B-I, C-II, D-IV
- (4) A-IV, B-II, C-III, D-I

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

**Solution:** The common cold is caused by rhinoviruses (A-III), which are known to cause upper respiratory tract infections. Haemozoin is a product of hemoglobin breakdown by Plasmodium, the parasite responsible for malaria (B-I). The Widal test is used to diagnose typhoid fever, which is caused by the bacterium *Salmonella typhi* (C-II). Allergies related to dust mites involve immune reactions to the proteins found in the waste products of dust mites (D-IV). This matching tests your knowledge of infectious agents and their associated diagnostic tools.

#### Quick Tip

Being able to identify the causative agents of diseases and their diagnostic tests is essential for effective disease management.

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**154. 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-I, B-III, C-II, D-IV
- (2) A-IV, B-III, C-I, D-II
- (3) A-III, B-I, C-IV, D-II
- (4) A-II, B-IV, C-III, D-I

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

**Solution:** Typhoid is caused by the bacterium *Salmonella typhi* (A-IV). Leishmaniasis is caused by protozoan parasites of the genus *Leishmania* (B-III). Ringworm, a fungal infection, is caused by fungi that live on the skin, hair, and nails (C-I). Filariasis is caused by nematodes (roundworms) of the family Filarioidea, transmitted by mosquito bites (D-II). This question helps in understanding the specific pathogens responsible for various infectious diseases and their classifications.

#### Quick Tip

Knowing the correct pathogen and the resulting disease is key for effective treatment and control.

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**155. The flippers of the Penguins and Dolphins are an example of:**

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

**Correct Answer:** (3) Convergent evolution

**Solution:** The flippers of penguins and dolphins provide an excellent example of convergent evolution. Although penguins are birds and dolphins are mammals, both species have evolved similar flippers as a result of living in similar aquatic environments. This convergence demonstrates how different evolutionary paths can lead to similar adaptations due to similar environmental pressures.

#### Quick Tip

Convergent evolution occurs when unrelated species develop similar traits due to comparable selective pressures in their environment.

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**156. 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) E-C-A-D-B
- (2) A-E-C-B-D
- (3) B-D-E-C-A
- (4) E-A-D-B-C

**Correct Answer:** (1) E-C-A-D-B

**Solution:** The correct sequence for the conduction of an action potential through the heart begins at the sinoatrial (SA) node (E), which generates the electrical impulse that triggers heartbeats. The impulse travels to the atrioventricular (AV) node (C), then passes through the AV bundle (A) and bundle branches (D), before reaching the Purkinje fibers (B), which carry the impulse to the ventricular muscles, leading to contraction. This orderly conduction ensures synchronized heartbeats and efficient blood flow.

#### Quick Tip

Understanding the heart's conduction system is crucial for diagnosing and treating cardiac arrhythmias and other heart conditions.

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**157. Which of the following statements is incorrect?**

- (1) A bio-reactor provides optimal growth conditions for achieving the desired product
- (2) Most commonly used bio-reactors are of stirring type
- (3) Bio-reactors are used to produce small scale bacterial cultures
- (4) Bio-reactors have an agitator system, an oxygen delivery system, and foam control system

**Correct Answer:** (3) Bio-reactors are used to produce small scale bacterial cultures

**Solution:** The incorrect statement is that bio-reactors are used to produce small-scale bacterial cultures (3). Bio-reactors are typically designed for large-scale production, used in industries like pharmaceuticals, biotechnology, and food processing, where optimal conditions for the growth of microorganisms are maintained. They are equipped with systems for temperature control, pH regulation, oxygen supply, and foam control to maximize production efficiency.

### Quick Tip

Bio-reactors are essential for large-scale production in the biotechnology industry, enabling the efficient manufacture of biological products.

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

- (1) Uterine fundus
- (2) Isthmus
- (3) Infundibulum
- (4) Ampulla

**Correct Answer:** (1) Uterine fundus

**Solution:** The uterine fundus is the upper part of the uterus, above the openings of the Fallopian tubes, and is not a part of the Fallopian tube. The Fallopian tube consists of the infundibulum, isthmus, and ampulla, which are involved in transporting the egg from the ovary to the uterus. Understanding the anatomy of the female reproductive system is essential for reproductive health studies and gynecological practices.

### Quick Tip

Knowledge of the female reproductive anatomy is critical for diagnosing and treating various reproductive health conditions.

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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 option given below:

- (1) Both Statement I and Statement II are true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II is false
- (4) Statement I is false but Statement II is true

**Correct Answer:** (2) Both Statement I and Statement II are false

**Solution:** Statement I is incorrect because the descending limb of the loop of Henle is permeable to water, allowing water reabsorption, but is largely impermeable to electrolytes. Statement II is also incorrect, as the proximal convoluted tubule is lined by simple cuboidal epithelium, not columnar, and this epithelium has a brush border that increases the surface area for absorption. These facts are important for understanding kidney function and fluid balance in the body.

#### Quick Tip

Accurate knowledge of nephron structure and its function is essential for understanding kidney physiology and diagnosing renal disorders.

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

- (1) Genetic recombination
- (2) Genetic drift
- (3) Gene migration
- (4) Constant gene pool

**Correct Answer:** (4) Constant gene pool

**Solution:** The Hardy-Weinberg equilibrium assumes no changes in allele frequencies, which is maintained in a constant gene pool (4). Factors such as genetic recombination, genetic drift, and gene migration lead to changes in allele frequencies, disrupting the equilibrium.

A constant gene pool means no changes in allele frequencies over generations, which aligns with Hardy-Weinberg conditions. This principle is fundamental in population genetics and the study of evolutionary processes.

#### Quick Tip

The Hardy-Weinberg equilibrium provides a baseline for studying genetic variation and evolutionary forces within populations.

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### 161. Which of the following is not a steroid hormone?

- (1) Cortisol
- (2) Testosterone
- (3) Progesterone
- (4) Glucagon

**Correct Answer:** (4) Glucagon

**Solution:** Glucagon is a peptide hormone, not a steroid hormone. It is produced by the alpha cells of the pancreas and plays a critical role in regulating blood glucose levels by promoting the breakdown of glycogen to glucose in the liver. Steroid hormones, like cortisol, testosterone, and progesterone, are derived from cholesterol and are involved in a range of physiological processes from stress response to reproductive functions. Understanding the differences between peptide and steroid hormones is fundamental in endocrinology, emphasizing their distinct synthesis pathways and mechanisms of action.

#### Quick Tip

Steroid hormones can cross cell membranes due to their lipophilic nature, binding to intracellular receptors, unlike peptide hormones that bind to surface receptors.

**162. 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-III, B-I, C-II, D-IV
- (2) A-I, B-III, C-IV, D-II
- (3) A-IV, B-I, C-II, D-III
- (4) A-III, B-I, C-IV, D-II

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

**Solution:** The correct matches for each type of IUD and implant are: Non-medicated IUDs like the Lippes loop (A-III) are simple devices that do not release any hormones or copper. Copper releasing IUDs such as Multiload 375 (B-I) release copper to increase contraceptive efficacy. Hormone releasing IUDs like LNG-20 (C-IV) release levonorgestrel, a hormone, to help prevent pregnancy. Lastly, implants such as those that release progestogens (D-II) are subdermal devices that provide long-term contraception. This question highlights various contraceptive technologies and their mechanisms of action.

**Quick Tip**

Choosing the right contraceptive method involves considering both the mechanism of action and individual health needs.

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

- (1) 5th segment
- (2) 10th segment
- (3) 8th and 9th segment
- (4) 11th segment

**Correct Answer:** (2) 10th segment

**Solution:** In cockroaches, the anal cerci are located at the 10th segment of the abdomen. These structures are sensitive to air currents, helping the cockroach detect movements around it, which is crucial for its survival as it allows the cockroach to respond quickly to potential threats. This anatomical feature is an example of how morphology can be linked to behavioral adaptations in insects.

#### Quick Tip

Anal cerci are used in various insects not only for sensing but also in mating rituals, showcasing the diverse functions of similar structures.

#### 164. Match List I with List II:

List I	List II
A. Expiratory capacity	I. Expiratory reserve volume + Tidal vol + Inspiratory reserve vol
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-II, B-IV, C-I, D-III
- (2) A-III, B-II, C-IV, D-I
- (3) A-II, B-I, C-IV, D-III
- (4) A-I, B-III, C-II, D-IV

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

**Solution:** Expiratory capacity (A) is the combination of tidal volume and expiratory reserve volume (A-II), representing the total volume of air expelled from the lungs during a normal exhalation followed by a forced exhalation. Functional residual capacity (B) includes the expiratory reserve volume plus the residual volume (B-IV), indicating the volume of air remaining in the lungs after a normal exhalation. Vital capacity (C) is the total volume of air that can be exhaled after a maximal inhalation, including tidal volume, inspiratory reserve volume, and expiratory reserve volume (C-I). Inspiratory capacity (D) is the sum of tidal volume and inspiratory reserve volume (D-III), representing the total volume of air that can be inhaled after a normal exhalation. Understanding these lung capacities is crucial for respiratory physiology and clinical assessments.

### Quick Tip

Lung capacity measurements are essential in diagnosing and monitoring respiratory conditions such as asthma and COPD.

### 165. 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-II, B-III, C-I, D-IV
- (2) A-III, B-IV, C-II, D-I
- (3) A-I, B-II, C-III, D-IV
- (4) A-II, B-I, C-IV, D-III

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

**Solution:** The pons acts as a bridge connecting different regions of the brain, facilitating communication between them (A-III). The hypothalamus contains neurosecretory cells that

are crucial for hormone production and regulation of the autonomic nervous system (B-IV). The medulla controls essential autonomic functions such as respiration and digestion (C-II). The cerebellum is critical for motor control, including the regulation of posture and balance (D-I). This question tests knowledge of the functions and locations of major brain structures, important for understanding neural control and integration.

#### Quick Tip

The central nervous system's complexity is organized functionally and anatomically to optimize neural processing and bodily control.

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#### 166. 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 true
- (2) Both Statement I and Statement II are false
- (3) Statement I is true but Statement II is false

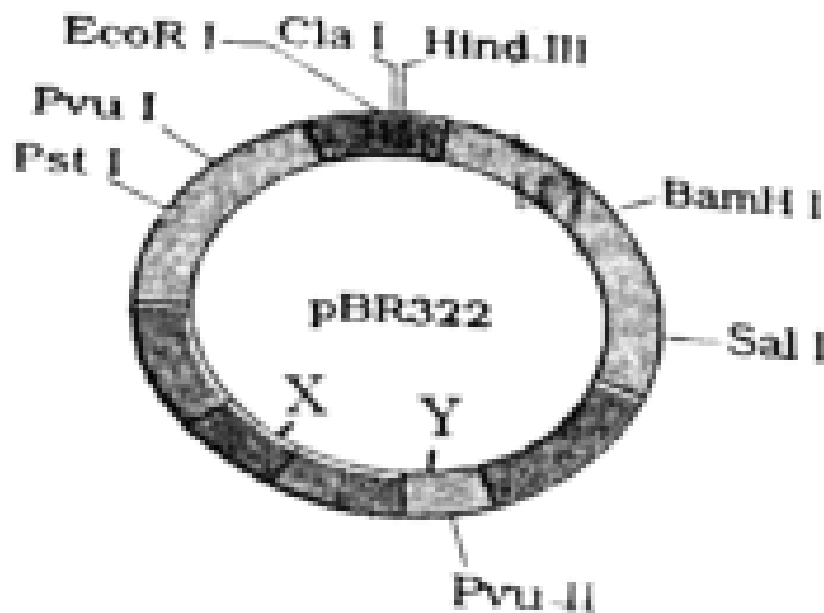
**Correct Answer:** (3) Statement I is true but Statement II is false

**Solution:** Statement I is true because the hymen can vary significantly in appearance and can be absent, torn, or stretched from activities other than sexual intercourse, such as physical activities or tampon use. Statement II is false as the hymen can be elastic or already have openings that do not tear during sexual activity; it does not always tear during the first coitus. This underscores the importance of understanding human anatomy and debunking myths related to physical indicators of virginity.

### Quick Tip

Educational efforts are essential to dispel myths regarding the hymen and virginity, promoting a more scientifically accurate understanding of human anatomy.

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



- (1) The gene 'X' is responsible for resistance to antibiotics and 'Y' for protein involved in the replication of Plasmid.
- (2) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.
- (3) The gene 'X' is for protein involved in replication of Plasmid and 'Y' for resistance to antibiotics.
- (4) Gene 'X' is responsible for recognitions sites and 'Y' is responsible for antibiotic resistance.

**Correct Answer:** (2) 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:** In the pBR322 vector, gene 'X' typically refers to elements like the *rop* gene that helps control the plasmid's copy number within the host cell, whereas gene 'Y' could refer to a gene like the *rep* gene involved in the initiation of plasmid DNA replication. This setup ensures that the plasmid can maintain itself efficiently within bacterial cells, crucial for its use in cloning and genetic engineering.

#### Quick Tip

Understanding plasmid functions such as copy number control and replication is critical in biotechnology and genetic engineering.

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

3' TACATGGCAAATATCCATTCA 5'

- (1) 5' AUGUACCGUUUUAUAGGUAAGU 3'
- (2) 5' AUGUAAAGUUUUAUAGGUAAGU 3'
- (3) 5' AUGUACCGUUUUAUAGGGAAGU 3'
- (4) 5' ATGTACCGTTTATAGGTAAGT 3'

**Correct Answer:** (1) 5' AUGUACCGUUUUAUAGGUAAGU 3'

**Solution:** The correct RNA sequence is synthesized by RNA polymerase which reads the DNA template strand from 3' to 5' and synthesizes RNA from 5' to 3'. The RNA sequence matching the DNA template 'TACATGGCAAATATCCATTCA' would be 'AUGUACCGU-UUAUAGGUAAGU', where each DNA base is transcribed to its complementary RNA base (A to U, T to A, C to G, G to C).

### Quick Tip

Understanding transcription fidelity is crucial for techniques in molecular biology, such as RNA synthesis and gene expression studies.

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#### 169. 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 & D only
- (2) A, B & E only
- (3) B, C & E only
- (4) C, D & E only

**Correct Answer:** (2) A, B & E only

**Solution:** Autoimmune disorders are conditions where the immune system mistakenly attacks the body's own tissues. Myasthenia gravis (A) involves antibodies that block or destroy muscle receptor cells, Rheumatoid arthritis (B) is characterized by immune-mediated destruction of joint linings, and Systemic Lupus Erythematosus (E) affects multiple organs with widespread inflammation and tissue damage. Gout and Muscular dystrophy, however, are not autoimmune; gout is a metabolic disorder and muscular dystrophy is a genetic disorder.

### Quick Tip

Recognition of autoimmune mechanisms can aid in the development of targeted therapies that modulate the immune response.

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

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

**Solution:** Pterophyllum is commonly known as the angel fish (A-III), an elegant, flat-bodied freshwater fish. Myxine, or hagfish (B-I), are jawless marine creatures known for their slime production. Pristis represents the sawfish (C-II), known for its long, toothed rostrum resembling a saw. Exocoetus, or flying fish (D-IV), are known for their ability to glide above the water's surface to escape predators. This question tests knowledge of common names and characteristics of various fish species, useful in studies of marine biology and ecology.

**Quick Tip**

Linking scientific names with common names enhances understanding of biodiversity and aids in more effective communication in biological sciences.

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171. 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 females and Leydig cells in males.

**Reason (R):** Growing ovarian follicles secrete estrogen in females while interstitial cells secrete androgen in males.

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

- (1) Both A and R are true and R is the correct explanation of A
- (2) Both A and R are true but R is NOT the correct explanation of A
- (3) A is true but R is false
- (4) A is false but R is true

**Correct Answer:** (4) A is false but R is true

**Solution:** Assertion (A) is incorrect because FSH acts on Sertoli cells in males, not Leydig cells, which are instead stimulated by LH. On the other hand, Reason (R) is accurate because it correctly explains the hormonal activity in females and males, where ovarian follicles release estrogen and interstitial cells produce androgens.

#### Quick Tip

Having a clear understanding of the specific actions of FSH and LH is essential for comprehending reproductive physiology and disorders related to hormone imbalances.

#### 172. 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-IV, B-II, C-III, D-I
- (2) A-III, B-II, C-I, D-IV
- (3) A-II, B-IV, C-I, D-III

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

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

**Solution:** Lipase is an enzyme that specifically breaks down ester bonds found in lipids (A-II). Nuclease is responsible for cutting phosphodiester bonds in nucleic acids (B-IV). Protease breaks peptide bonds in proteins (C-I). Amylase catalyzes the breakdown of glycosidic bonds in starch (D-III). This matching evaluates the enzymatic specificity and their role in biochemical reactions.

#### Quick Tip

Recognizing the specific bonds targeted by different enzymes is fundamental in biochemistry, especially in the context of molecular biology and medicine.

**173. 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-III, C-II, D-I
- (2) A-IV, B-II, C-III, D-I
- (3) A-II, B-IV, C-I, D-III
- (4) A-II, B-I, C-IV, D-III

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

**Solution:** Axoneme, which is the central structure of cilia and flagella, is crucial for their movement (A-II). The cartwheel pattern is characteristic of centrioles, visible during their replication (B-I). Cristae are folds inside mitochondria that increase the surface area for ATP production (C-IV). Satellites are repetitive DNA sequences typically found near centromeres on chromosomes (D-III). This matching tests knowledge of cellular structures and their specialized functions.

#### Quick Tip

Understanding the relationship between structure and function in cells enhances our ability to comprehend cellular activities and diseases.

#### 174. 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-IV, B-II, C-III, D-I
- (2) A-I, B-II, C-IV, D-III
- (3) A-II, B-IV, C-I, D-III
- (4) A-IV, B-III, C-II, D-I

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

**Solution:** Diakinesis is marked by the completion of the terminalization of chiasmata (A-II), where chromosomes prepare for their separation. Pachytene is characterized by the appearance of recombination nodules (B-IV), essential for genetic recombination. Zygotene is the

stage where synaptonemal complexes form to facilitate the pairing of chromosomes (C-I). During Leptotene, chromosomes first appear as thin threads under the microscope (D-III). This is fundamental to understanding genetic recombination and meiosis.

#### Quick Tip

Understanding the key events of meiosis, especially during prophase I, is vital for insights into genetic inheritance and variation.

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#### 175. 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) B only
- (2) A only
- (3) C only
- (4) D only

**Correct Answer:** (2) A only

**Solution:** Annelids are true coelomates, meaning they have a coelom fully lined with mesoderm (A). Poriferans lack a body cavity and are not pseudocoelomates (B is incorrect). Aschelminthes are pseudocoelomates, not acoelomates (C is incorrect). Platyhelminthes are acoelomates, having no body cavity (D is incorrect). Understanding these terms is essential for recognizing different types of body plans in animals.

### Quick Tip

Correctly identifying body cavity types helps in distinguishing between various animal phyla, crucial for understanding evolutionary biology and classification.

### 176. Match List I with List II:

List I	List II
A. $\alpha$ -I 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-II, B-I, C-IV, D-III
- (2) A-III, B-I, C-II, D-IV
- (3) A-III, B-IV, C-I, D-II
- (4) A-II, B-IV, C-I, D-III

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

**Solution:**  $\alpha$ -I antitrypsin is a protein that protects tissues from enzymes of inflammatory cells, especially in the lungs; deficiency can lead to emphysema (A-III). Cry IAb and Cry IAc are insecticidal proteins produced by *Bacillus thuringiensis*; Cry IAb targets the corn borer (B-IV) and Cry IAc targets the cotton bollworm (C-I). Enzyme replacement therapy is used to treat various deficiencies, such as ADA deficiency (D-II). This question helps in understanding biotechnological applications and their impact on medicine and agriculture.

### Quick Tip

Biotechnology utilizes biological systems to develop technologies that improve our lives and the health of our planet.

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**177. 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-IV, B-II, C-III, D-I
- (2) A-I, B-III, C-II, D-IV
- (3) A-II, B-III, C-I, D-IV
- (4) A-III, B-I, C-IV, D-II

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

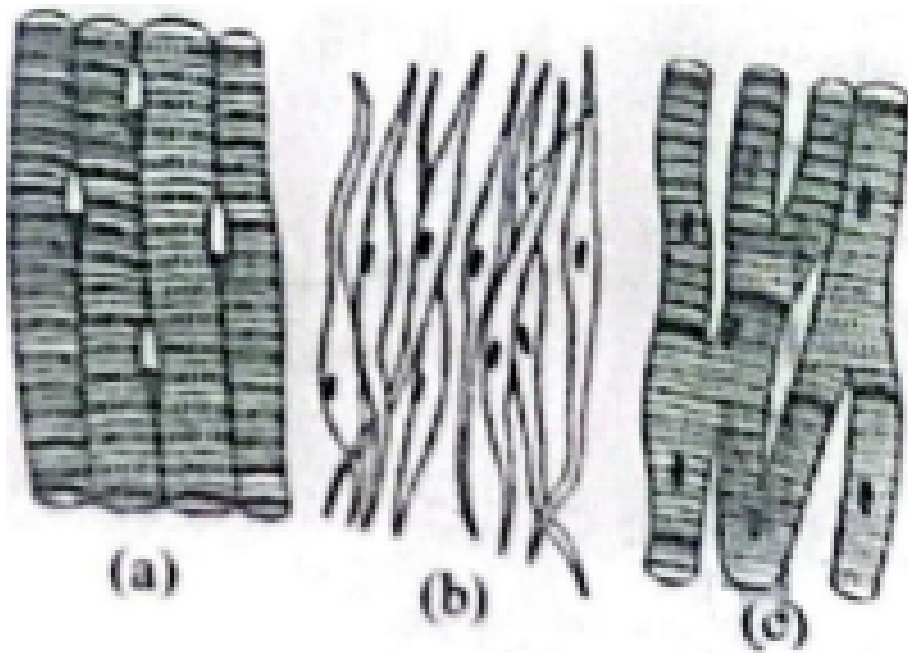
**Solution:** Fibrous joints, such as those in the skull, do not permit movement (A-III). Cartilaginous joints, like those found between adjacent vertebrae, allow limited movement (B-I). Hinge joints, such as the knee joint, facilitate movement in one plane, helping with locomotion (C-IV). Ball and socket joints, such as the shoulder joint between the humerus and pectoral girdle, permit rotational and other movements (D-II). This question helps in understanding the anatomy and function of various joint types.

**Quick Tip**

Recognizing the types of joints and their movements is important for diagnosing musculoskeletal disorders and improving physical therapy treatments.

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**178. 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) Smooth - Toes, (b) Skeletal – Legs, (c) Cardiac – Heart
- (2) (a) Skeletal - Triceps, (b) Smooth – Stomach, (c) Cardiac – Heart
- (3) (a) Skeletal - Biceps, (b) Involuntary – Intestine, (c) Smooth – Heart
- (4) (a) Involuntary – Nose tip, (b) Skeletal – Bone, (c) Cardiac – Heart

**Correct Answer:** (2) (a) Skeletal - Triceps, (b) Smooth – Stomach, (c) Cardiac – Heart

**Solution:** The correct matching of muscle types to their locations in the human body is: (a) Skeletal muscles like the triceps are located in the arms, enabling movement; (b) Smooth muscles are found in organs such as the stomach, aiding in involuntary functions like digestion; (c) Cardiac muscle, which is found exclusively in the heart, is crucial for pumping blood throughout the body. This question assesses knowledge of muscle types and their anatomical locations, important for understanding human physiology.

### Quick Tip

Knowing the function and location of different muscle types helps in understanding their roles in health and disease.

### 179. Match List I with List II:

List I	List II
A. Down's syndrome	I. 11 <sup>th</sup> chromosome
B. $\alpha$ -Thalassemia	II. X chromosome
C. $\beta$ -Thalassemia	III. 21 <sup>st</sup> chromosome
D. Klinefelter's syndrome	IV. 16 <sup>th</sup> chromosome

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

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

**Solution:** Down's syndrome is associated with an extra copy of the 21st chromosome (A-III),  $\alpha$ -Thalassemia is linked to defects on the 16th chromosome (B-IV),  $\beta$ -Thalassemia involves the 11th chromosome (C-I), and Klinefelter's syndrome is characterized by an extra 'X' chromosome (D-II). This question helps in understanding genetic disorders and their chromosomal bases.

### Quick Tip

Accurate knowledge of genetic disorders and their chromosomal links is crucial for diagnosis and genetic counseling.

---

**180. Which of the following factors are favorable for the formation of oxyhaemoglobin in alveoli?**

- (1) High pO<sub>2</sub> and High pCO<sub>2</sub>
- (2) High pO<sub>2</sub> and Lesser H<sup>+</sup> concentration
- (3) Low pCO<sub>2</sub> and High H<sup>+</sup> concentration
- (4) Low pCO<sub>2</sub> and High temperature

**Correct Answer:** (2) High pO<sub>2</sub> and Lesser H<sup>+</sup> concentration

**Solution:** High partial pressure of oxygen (pO<sub>2</sub>) and lower hydrogen ion (H<sup>+</sup>) concentration enhance the formation of oxyhaemoglobin in the alveoli. High pO<sub>2</sub> increases the oxygen saturation of haemoglobin, while lower H<sup>+</sup> concentration reduces the Bohr effect, thereby facilitating the uptake of oxygen by haemoglobin.

**Quick Tip**

Understanding the conditions that favor oxyhaemoglobin formation can help in assessing respiratory efficiency and the oxygen-carrying capacity of the blood.

---

**181. 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) D-A-C-B
- (2) B-A-D-C

(3) C-B-D-A

(4) A-D-C-B

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

**Solution:** The correct chronological sequence of human evolution, from earliest to most recent, is: Homo habilis (A) as one of the earliest known species using tools, Homo erectus (D) known for significant brain enlargement and use of fire, Homo neanderthalensis (C) known for robust build and adaptability to cold climates, and Homo sapiens (B) which represents modern humans, known for advanced tools and complex social structures.

#### Quick Tip

Studying human evolution provides insights into our biological history and the evolutionary processes that influence our current form and behaviors.

#### 182. Match List I with List II:

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

Choose the correct answer from the options given below:

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

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

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

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

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

**Solution:** Cocaine is derived from the *Erythroxylum coca* plant (A-III), heroin is processed from morphine, which comes from *Papaver somniferum*, the opium poppy (B-IV), morphine is also derived from *Papaver somniferum* (C-I), and marijuana comes from *Cannabis sativa* (D-II). This question tests knowledge of the source plants of various drugs, important for understanding their effects and regulation.

#### Quick Tip

Knowledge of the origins and effects of psychoactive substances can aid in their proper regulation and in public health education.

---

**183. Given below are two statements: One is labelled as Assertion (A) and the other is labelled as Reason (R): Assertion (A):** Breast-feeding during 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 new born 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 and R is the correct explanation of A

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

(3) A is correct but R is not correct

(4) A is not correct but R is correct

**Correct Answer:** (1) Both A and R are correct and R is the correct explanation of A

**Solution:** Both statements are correct and Reason (R) is the correct explanation for Assertion (A). Breastfeeding is highly recommended as it not only provides complete nutrition but also passes essential antibodies found in colostrum, which protect the newborn against various diseases, boosting their immune system early in life.

### Quick Tip

The benefits of breastfeeding extend beyond basic nutrition, including enhanced immunity and improved health outcomes for babies.

- 
- 184. Which of the following is not a natural/traditional contraceptive method?** (1) Coitus interruptus  
(2) Periodic abstinence  
(3) Lactational amenorrhea  
(4) Vaults

**Correct Answer:** (4) Vaults

**Solution:** Vaults, or cervical caps, are not traditional methods; they are barrier methods of contraception that involve a device placed over the cervix to prevent sperm from entering the uterus. The other options listed are considered natural or traditional methods, relying on behavior rather than devices.

### Quick Tip

Understanding the range of contraceptive methods available can aid individuals in choosing the most appropriate method for their needs.

- 
- 185. The “Ti plasmid” of *Agrobacterium tumefaciens* stands for** (1) Tumour inhibiting plasmid  
(2) Tumor independent plasmid  
(3) Tumor inducing plasmid  
(4) Temperature independent plasmid

**Correct Answer:** (3) Tumor inducing plasmid

**Solution:** The "Ti plasmid" in *Agrobacterium tumefaciens* stands for "tumor inducing" plasmid. This plasmid is responsible for transferring part of its DNA to plant cells, leading to the formation of tumors or galls. This mechanism has been harnessed in genetic engineering to introduce new genes into plants.

#### Quick Tip

The manipulation of the Ti plasmid has significant applications in biotechnology, especially in creating genetically modified plants.

#### 186. Match List I with List II:

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

Choose the correct answer from the options given below:

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

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

**Solution:** A. Exophthalmic goiter is associated with hypersecretion of thyroid hormones and protruding eyeballs, which corresponds to III.

B. Acromegaly is caused by the excessive secretion of growth hormone, corresponding to IV.

C. Cushing's syndrome involves excess secretion of cortisol, leading to symptoms like moon face and hyperglycemia, corresponding to I.

D. Cretinism is caused by hypothyroidism in early childhood, leading to stunted growth, corresponding to II.

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

#### Quick Tip

Exophthalmic goiter is another name for Graves' disease, characterized by hyperthyroidism and protruding eyeballs.

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**187. Given below are two statements:** Statement I: Mitochondria and chloroplasts both are double-membrane-bound organelles. Statement II: The inner membrane of mitochondria is relatively less permeable, as compared to chloroplasts.

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

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

**Correct Answer:** (3) Statement I is correct but Statement II is incorrect.

**Solution:** - Statement I is correct because both mitochondria and chloroplasts are double-membrane-bound organelles, which are essential for their respective roles in energy metabolism (mitochondria) and photosynthesis (chloroplasts). - Statement II is incorrect because the inner membrane of mitochondria is more impermeable compared to the outer membrane, whereas in chloroplasts, both membranes are relatively permeable to ions and molecules.

**Conclusion:** The correct answer is (3) Statement I is correct but Statement II is incorrect.

### Quick Tip

Both mitochondria and chloroplasts have double membranes, but their permeability characteristics are different.

**188. Regarding the 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 the active site.

Choose the correct answer from the options given below:

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

**Correct Answer:** (1) E, A, D, C, B

**Solution:** The correct sequence for the catalytic cycle of enzyme action is:

E. Substrate binding to the active site: The enzyme's active site binds to the substrate, initiating the reaction.

A. Substrate-enzyme complex formation: After the substrate binds, an enzyme-substrate complex forms.

D. Chemical bonds of the substrate broken: The enzyme catalyzes the breaking of chemical bonds in the substrate.

C. Release of products: The products of the reaction are released from the enzyme.

B. Free enzyme ready to bind with another substrate: The enzyme is now free to bind with another substrate and repeat the process.

**Conclusion:** The correct answer is (1) E, A, D, C, B.

### Quick Tip

Enzyme catalysis involves the formation of an enzyme-substrate complex, followed by product formation and release, after which the enzyme is free to catalyze further reactions.

### 189. Match List I with List II related to the digestive system of a 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-IV, B-II, C-III, D-I
- (2) A-I, B-II, C-III, D-IV
- (3) A-IV, B-III, C-II, D-I
- (4) A-III, B-II, C-IV, D-I

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

**Solution:** A. The structures used for storing food: The crop is responsible for storing food in a cockroach, corresponding to IV.

B. Ring of 6-8 blind tubules at junction of foregut and midgut: These structures are gastric caeca, corresponding to II.

C. Ring of 100-150 yellow colored thin filaments at junction of midgut and hindgut: These are Malpighian tubules, corresponding to III.

D. The structures used for grinding the food: The gizzard is responsible for grinding food, corresponding to I.

**Conclusion:** The correct answer is (1) A-IV, B-II, C-III, D-I.

### Quick Tip

In cockroaches, the crop stores food, the gastric caeca aid digestion, the Malpighian tubules excrete waste, and the gizzard grinds food.

---

**190. 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 & C only
- (2) A, B & D only
- (3) B, D & E only
- (4) B, C & D only

**Correct Answer:** (3) B, D & E only

**Solution:** A is true for chordates but not for all non-chordates.

B is true for non-chordates as they do not possess a notochord.

D is true for many non-chordates, as their heart is dorsal (e.g., arthropods).

E is true for some non-chordates, as they lack a post-anal tail (e.g., arthropods).

C is false for all non-chordates, as their central nervous system is not dorsal.

**Conclusion:** The correct answer is (3) B, D & E only.

### Quick Tip

Non-chordates typically lack a notochord, dorsal nervous system, and a post-anal tail, distinguishing them from chordates.

---

**191. Choose the correct statement given below regarding juxtamedullary nephron.**

- (1) Juxtamedullary nephrons are located in the columns of Bertini.
- (2) Renal corpuscle of juxtamedullary nephron lies in the outer portion of the renal medulla.
- (3) Loop of Henle of juxtamedullary nephron runs deep into medulla.
- (4) Juxtamedullary nephrons outnumber the cortical nephrons.

**Correct Answer:** (3) Loop of Henle of juxtamedullary nephron runs deep into medulla.

**Solution:** Juxtamedullary nephrons are defined by their long loops of Henle, which extend deep into the renal medulla. This structure is key for the concentration of urine through a countercurrent exchange mechanism.

The renal corpuscle of juxtamedullary nephrons is positioned at the boundary between the renal cortex and medulla, not in the outer medulla. Additionally, juxtamedullary nephrons are fewer in number compared to cortical nephrons.

Columns of Bertini, which are found in the renal cortex, do not house juxtamedullary nephrons.

**Conclusion:** The correct answer is (3) Loop of Henle of juxtamedullary nephron runs deep into medulla.

#### Quick Tip

Juxtamedullary nephrons play a vital role in producing concentrated urine through their long loops of Henle, crucial for water balance.

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**192. Given below are two statements:** Statement I: The cerebral hemispheres are connected by a nerve tract known as the corpus callosum. Statement II: The brain stem consists of the medulla oblongata, pons, and cerebrum.

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

- (1) Both Statement I and Statement II are correct.
- (2) Both Statement I and Statement II are incorrect.

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

**Correct Answer:** (3) Statement I is correct but Statement II is incorrect.

**Solution:** Statement I is accurate as the corpus callosum is a large bundle of nerve fibers that connects the right and left cerebral hemispheres, allowing communication between them. Statement II is incorrect because the brainstem consists of the medulla oblongata, pons, and midbrain, not the cerebrum, which is part of the forebrain and not involved in the brainstem.

**Conclusion:** The correct answer is (3) Statement I is correct but Statement II is incorrect.

#### Quick Tip

The brainstem controls basic life functions, whereas the cerebrum is responsible for higher functions such as thinking, memory, and voluntary movement.

#### 193. Match List I with List II:

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

Choose the correct answer from the options given below:

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

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

- Solution:** - A. P wave represents the depolarization of the atria, corresponding to III.  
 - B. QRS complex is linked to the depolarization of the ventricles, corresponding to II.  
 - C. T wave corresponds to the repolarization of the ventricles, linked to IV.  
 - D. T-P gap refers to the period during which heart muscles are electrically silent, corresponding to I.

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

**Quick Tip**

ECG provides critical insights into the heart's electrical activity, with each wave representing specific phases of depolarization and repolarization in the cardiac cycle.

**194. 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-II, B-I, C-III, D-IV  
 (2) A-III, B-I, C-II, D-IV  
 (3) A-I, B-II, C-IV, D-III  
 (4) A-III, B-I, C-IV, D-II

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

**Solution:**

- A. Mesozoic Era is known for the rise of birds and reptiles, corresponding to III.
- B. Proterozoic Era is marked by the appearance of lower invertebrates, corresponding to I.
- C. Cenozoic Era is the age of mammals, corresponding to IV.
- D. Paleozoic Era is characterized by the emergence of fish and amphibians, corresponding to II.

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

#### Quick Tip

Each geological era highlights the development and dominance of different life forms, with the Mesozoic known for reptiles and the Cenozoic for mammals.

**195. 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.  $I^B I^A / ii$
- B.  $I^B I^B / I^A I^A$
- C.  $I^A I^B / ii$
- D.  $I^A I^B / I^A I^i$
- E.  $ii / I^A I^B / I^A I^B$

- (1) A only
- (2) B only
- (3) C & B only
- (4) D & E only

**Correct Answer:** (1) A only

**Solution:** The father's blood group is B+, which means his genotype can be  $I_B I_B$  (homozygous) or  $I_B i$  (heterozygous).

The mother's blood group is A+, which means her genotype can be  $I_A I_A$  or  $I_A i$ .

The child's blood group is O+, which must have the genotype  $ii$  as O blood type is recessive. For the child to inherit  $ii$ , both parents must contribute an  $i$  allele, meaning both parents must be heterozygous:  $I_B i$  (father) and  $I_A i$  (mother).

#### Quick Tip

For a child to have blood group O, both parents must carry the  $i$  allele.

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#### 196. 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 true.
- (2) Both Statement I and Statement II are false.
- (3) Statement I is true but Statement II is false.
- (4) Statement I is false but Statement II is true.

**Correct Answer:** (4) Statement I is false but Statement II is true.

**Solution:** Statement I is false because Gause's competitive exclusion principle actually states that two closely related species competing for the *same* resources cannot coexist indefinitely. Statement II is true as it correctly reflects that in competitive scenarios under limited resources, typically the inferior competitor will be eliminated.

### Quick Tip

Understanding ecological principles like Gause's can help in conservation efforts by predicting the outcomes of species interactions.

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#### 197. 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 correct.
- (2) Both Statement I and Statement II are incorrect.
- (3) Statement I is correct but Statement II is incorrect.
- (4) Statement I is incorrect but Statement II is correct.

**Correct Answer:** (3) Statement I is correct but Statement II is incorrect.

**Solution:** Statement I is correct; bone marrow is indeed the primary site for the production of all types of blood cells, including lymphocytes. However, Statement II is incorrect because while the thymus is involved in the maturation of T-lymphocytes, bone marrow does not directly contribute to the maturation of T-lymphocytes; it is involved in their initial formation.

### Quick Tip

Knowledge of where blood cells are formed and matured is essential in medical sciences, especially in immunology and hematology.

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#### 198. 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-II, B-I, C-III, D-IV
- (2) A-IV, B-III, C-I, D-II
- (3) A-III, B-IV, C-I, D-II
- (4) A-II, B-I, C-IV, D-III

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

**Solution:** Unicellular glandular epithelium like goblet cells are found in the alimentary canal (A-III). Compound epithelium is found on moist surfaces like the buccal cavity (B-IV). Multicellular glandular epithelium like that in salivary glands produces various secretions (C-I). Endocrine glandular epithelium, such as in the pancreas, secretes hormones directly into the bloodstream (D-II).

#### Quick Tip

Understanding the structure and function of different types of epithelial tissue is crucial in anatomy and physiology for insights into how various body systems operate.

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**199. 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-II, B-IV, C-I, D-III
- (2) A-III, B-II, C-IV, D-I
- (3) A-III, B-IV, C-I, D-II
- (4) A-IV, B-III, C-I, D-II

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

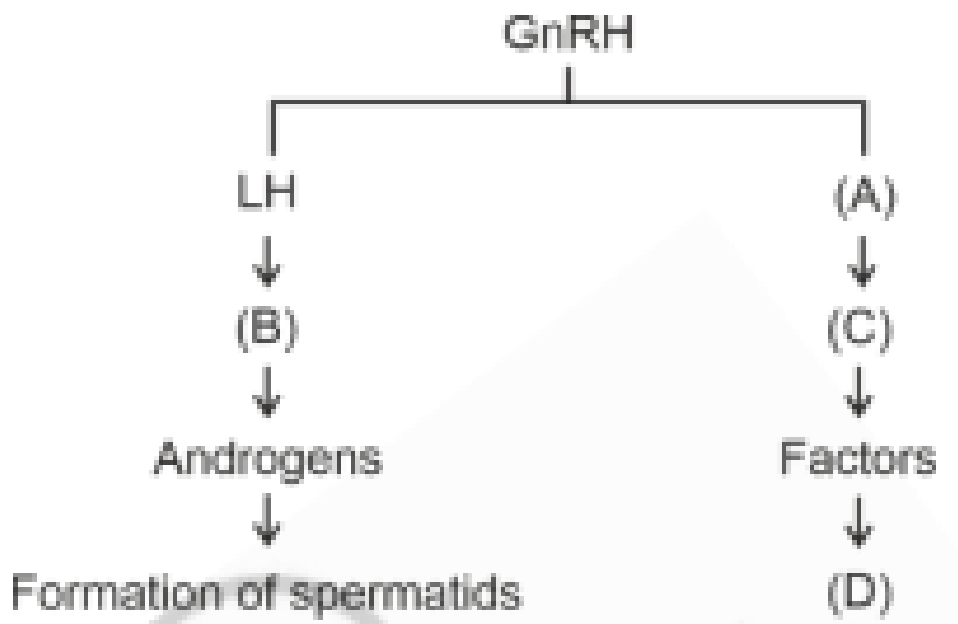
**Solution:** RNA polymerase III transcribes genes encoding tRNAs and some snRNAs (A-IV). The termination of transcription in prokaryotes often involves the Rho factor (B-III). Splicing of exons is facilitated by snRNPs, which are part of the spliceosome complex (C-I). The TATA box is a core promotor element found in many genes (D-II).

#### Quick Tip

Familiarity with molecular biology's core concepts, like transcription and splicing, is vital for understanding genetic expression and regulation.

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



- (1) FSH, Leydig cells, Sertoli cells, spermiogenesis.
- (2) ICSH, Interstitial cells, Leydig cells, spermiogenesis.
- (3) FSH, Sertoli cells, Leydig cells, spermatogenesis.
- (4) ICSH, Leydig cells, Sertoli cells, spermatogenesis.

**Correct Answer:** (1) FSH, Leydig cells, Sertoli cells, spermiogenesis.

**Solution:** FSH stimulates Sertoli cells, which in turn support spermatogenesis. Leydig cells, stimulated by LH (also known as ICSH in males), produce testosterone, crucial for the final stages of spermatogenesis, known as spermiogenesis.

#### Quick Tip

Understanding hormonal regulation of spermatogenesis is important in fields like endocrinology and reproductive medicine.