NEET 2024 S1 Zoology Question Paper with Solutions

Time Allowed :3 Hours 20 Minutes	**Maximum Marks :**720	**Total Questions :**200

151.

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

(1) Low pCO_2 and High temperature

(2) High pO_2 and High pCO_2

(3) High pO_2 and Lesser H^+ concentration

(4) Low pCO_2 and High H^+ concentration

Solution:

The formation of oxyhaemoglobin is favoured in conditions of high pO_2 and low H^+ concentration, as it enhances oxygen binding to hemoglobin.

Correct Answer: (3) High pO_2 and Lesser H^+ concentration

Quick Tip

Oxyhaemoglobin forms more efficiently when pO_2 is high (as in alveoli) and pCO_2 is low, favoring oxygen binding.

152.

Following are the stages of cell division:

A. Gap 2 phase

B. Cytokinesis

C. Synthesis phase

D. Karyokinesis

E. Gap 1 phase

Solution:

The correct sequence of stages in cell division is: - Gap 1 phase (E) - Synthesis phase (C) - Gap 2 phase (A) - Karyokinesis (D) - Cytokinesis (B)

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

Quick Tip

Cell division follows a specific sequence: G1, S, G2, mitosis (karyokinesis), and cytokinesis.

153.

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

which segment?

Solution:

The anal cerci in cockroaches are present on the **10th segment**.

Correct Answer: (3) 10^{th} segment

Quick Tip

- The anal cerci are sensory organs found on the 10th abdominal segment of both male and female cockroaches.

154.

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

Solution:

The correct matching is: - A. Pleurobrachia $\rightarrow$ II. Ctenophora - B. Radula $\rightarrow$ I. Mollusca - C. Stomochord $\rightarrow$ IV. Hemichordata - D. Air bladder $\rightarrow$ III. Osteichthyes

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

Quick Tip

- Pleurobrachia is a genus of Ctenophora (comb jellies). - Radula is a characteristic of molluscs. - Stomochord is a structure found in hemichordates. - Air bladder is a feature of osteichthyes (bony fish).

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155. Match List I with List II:

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

Solution:

- A - IV (Typhoid is caused by bacteria)
- B - III (Leishmaniasis is caused by protozoa)
- C - I (Ringworm is a fungal infection)
- D - II (Filariasis is caused by nematodes)

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

Quick Tip

Quick Tip: Remember that the pathogens of diseases can be classified as bacteria, viruses, fungi, protozoa, or worms (nematodes). Knowing the disease and its causative agent helps in matching them correctly.

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156. Match List I with List II:

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

Solution:

- A - I (Cocaine is an effective sedative in surgery)
- B - IV (Heroin is derived from Papaver somniferum)
- C - III (Morphine is derived from Erythroxylum)
- D - II (Marijuana is derived from Cannabis sativa)

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

Quick Tip

Quick Tip: Understanding the origins of substances and their medicinal properties helps in matching them to their respective uses and sources.

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

- **List of muscles/locations:**
  - (1) (a) Involuntary - Nose tip (b) Skeletal - Bone (c) Cardiac - Heart
  - (2) (a) Smooth - Toes (b) Skeletal - Legs (c) Cardiac - Heart
  - (3) (a) Skeletal - Triceps (b) Smooth - Stomach (c) Smooth - Heart
  - (4) (a) Skeletal - Biceps (b) Involuntary - Intestine (c) Cardiac - Heart

Solution:

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

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

Quick Tip

Quick Tip: Understanding the differences in the structure and location of various muscle types—skeletal, smooth, and cardiac—helps in identifying them accurately.

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158. Match List I with List II:

1. A. Pons
   B. Hypothalamus
   C. Medulla
   D. Cerebellum

List II:

1. I. Provides additional space for Neurons, regulates posture and balance.
2. II. Controls respiration and gastric secretions.

3. III. Connects different regions of the brain.
4. IV. Neuro secretory cells

Solution:

The **Pons** (A) is a part of the brainstem and is responsible for regulating various functions such as posture and balance. The pons also provides additional space for neurons and serves as a relay between different parts of the brain. Hence, it matches with List II as **I. Provides additional space for Neurons, regulates posture and balance.**

The **Hypothalamus** (B) plays a crucial role in regulating several essential bodily functions, including hunger, thirst, temperature control, and regulating the pituitary gland. The hypothalamus controls respiration and gastric secretions, which makes it match with **II. Controls respiration and gastric secretions.**

The **Medulla** (C) is the part of the brainstem that is responsible for regulating autonomic functions, such as heart rate, blood pressure, and respiratory rate. It is essential in maintaining the body's homeostasis and therefore matches with **III. Connects different regions of the brain.**

The **Cerebellum** (D) is located at the back of the brain and is responsible for coordinating voluntary movements such as balance, posture, and motor control. It also contains neurosecretory cells that play an important role in regulating various physiological processes. Therefore, it matches with **IV. Neuro secretory cells.**

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

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159. Match List I with List II:

1. A. α-I antitrypsin
   B. Cry IAb
   C. Cry IAc
   D. Enzyme replacement therapy

List II:

1. I. Cotton bollworm
2. II. ADA deficiency

3. III. Emphysema
4. IV. Corn borer

Solution:

The α**-I antitrypsin** (A) is a protein that helps protect the lungs from damage by inhibiting the activity of enzymes such as elastase. A deficiency in α-I antitrypsin can lead to lung conditions such as emphysema. Therefore, it matches with **III. Emphysema.**

The **Cry IAb** (B) is a toxin produced by the bacterium *Bacillus thuringiensis* that is toxic to certain insect larvae. Specifically, it is effective in controlling pests like the corn borer, hence matching with **IV. Corn borer.**

The **Cry IAc** (C) is another toxin variant of *Bacillus thuringiensis* that has been found to be particularly effective against the cotton bollworm, a major pest in cotton cultivation. As such, it matches with **I. Cotton bollworm.**

Enzyme replacement therapy (D) is a treatment method that involves supplementing the body with the necessary enzymes it lacks. It is commonly used for conditions like ADA (Adenosine Deaminase) deficiency, where patients are given enzyme replacements to help treat this genetic disorder. Therefore, it matches with **II. ADA deficiency.**

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

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160. Given below are some stages of human evolution. Arrange them in correct sequence. (Past to Recent)

1. 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. (1) A-D-C-B
2. (2) D-A-C-B
3. (3) B-A-D-C

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

Solution:

The sequence of human evolution from past to recent is: - **Homo habilis** is considered one of the earliest species of the genus Homo, existing around 2.4 to 1.4 million years ago. Hence, it comes first in the sequence. - **Homo erectus**, an extinct species of early humans, evolved next and is regarded as the ancestor of both modern humans and the later Homo species. - **Homo neanderthalensis** or Neanderthals existed around 400,000 to 40,000 years ago, evolving after Homo erectus. - Finally, **Homo sapiens**, modern humans, evolved last and are the most recent species.

Thus, the correct order is **A-D-C-B**.

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

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

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

Solution:

The Fallopian tube, also known as the oviduct, is a part of the female reproductive system and is composed of several distinct parts: - The **Ampulla** is the widest section of the tube and is where fertilization usually occurs. - The **Isthmus** is the narrowest part of the Fallopian tube, connecting the ampulla to the uterus. - The **Infundibulum** is the funnel-shaped portion of the tube near the ovary that helps in capturing the egg after ovulation.

However, the **Uterine fundus** is not a part of the Fallopian tube; it refers to the top portion of the uterus, above the openings of the Fallopian tubes.

Correct Answer: (2) Uterine fundus

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162. Match List I with List II:

1. A. Non-medicated IUD

B. Copper releasing IUD

C. Hormone releasing IUD

D. Implants

1. I. Multiload 375

   II. Progestogens

   III. Lippes loop

   IV. LNG-20

Choose the correct answer from the options given below:

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

Solution:

- **Non-medicated IUD** is typically a device like **Lippes loop** that does not release any drugs and only acts as a physical barrier. - **Copper releasing IUD** releases copper ions which are toxic to sperm and help in contraception. The well-known example is **Multiload 375**. - **Hormone releasing IUD** releases progestogens to prevent pregnancy. One example is **LNG-20**. - **Implants** release progestogen and are a method of contraception that is typically long-lasting.

Thus, the correct matching is: **A-III, B-IV, C-II, D-I**

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

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

(A) Vaults

(B) Coitus interruptus

(C) Periodic abstinence

(D) Lactational amenorrhea

Correct Answer: (A) Vaults

Solution:

Step 1: Understanding Natural Contraceptive Methods

- Natural contraception relies on the body's biological functions without external interventions. - Coitus interruptus (withdrawal), periodic abstinence, and lactational amenorrhea are natural methods.

Step 2: Identify the Incorrect Option

- Vaults are **barrier methods** (diaphragms or caps) placed inside the female reproductive tract, making them **non-natural** contraception.

Step 3: Conclusion

Since Vaults involve artificial means, the correct answer is **(A) Vaults**.

Quick Tip

Natural contraception includes behavioral and physiological methods like abstinence, withdrawal, and fertility awareness.

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164. Match List I with List II:

List I:

(A) *Pterophyllum*

(B) *Myxine*

(C) *Pristis*

(D) *Exocoetus*

List II:

(I) Hagfish

(II) Sawfish

(III) Angel fish

(IV) Flying fish

Choose the correct answer from the options given below:

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

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

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

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

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

Solution:

Step 1: Identify the Organisms

- **Pterophyllum** (Angelfish) → (III) Angel Fish

- **Myxine** (Hagfish) → (I) Hag Fish

- **Pristis** (Sawfish) → (II) Saw Fish

- **Exocoetus** (Flying Fish) → (IV) Flying Fish

Step 2: Match List I with List II

List I	List II
Pterophyllum	$AngelFish(III)$
Myxine	$HagFish(I)$
Pristis	$SawFish(II)$
Exocoetus	$FlyingFish(IV)$

Step 3: Conclusion

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

Quick Tip

Taxonomic classification helps in understanding fish diversity, including their evolutionary adaptations.

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

(A) Divergent evolution

(B) Adaptive radiation

(C) Natural selection

(D) Convergent evolution

Correct Answer: (D) Convergent evolution

Solution:

Step 1: Understanding Evolutionary Concepts

- **Divergent Evolution**: Organisms share a common ancestor but develop different

structures over time. - **Convergent Evolution**: Different species develop similar structures due to similar environmental pressures. - **Adaptive Radiation**: Rapid diversification from a common ancestor. - **Natural Selection**: Survival and reproduction based on advantageous traits.

Step 2: Identifying the Correct Type of Evolution

- **Penguins (Birds) and Dolphins (Mammals)** evolved flippers independently due to **aquatic adaptation**. - This is an example of **convergent evolution**, as their flippers serve similar functions but originate from different ancestral structures.

Step 3: Conclusion

Thus, the correct answer is **(D) Convergent Evolution**.

Quick Tip

Convergent evolution occurs when unrelated species develop similar traits due to environmental adaptation.

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

(A) Glucagon

(B) Cortisol

(C) Testosterone

(D) Progesterone

Correct Answer: (A) Glucagon

Solution:

Step 1: Classify Steroid Hormones

Steroid hormones are derived from cholesterol and include hormones like cortisol, testosterone, and progesterone.

Step 2: Identify the Non-Steroid Hormone

Glucagon is a **peptide hormone** produced by the pancreas, not a steroid hormone.

Step 3: Conclusion

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

Quick Tip

Steroid hormones include cortisol, testosterone, and progesterone, while glucagon is a peptide hormone.

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167. Match List I with List II:

List I:

(A) Down's syndrome

(B) α-Thalassemia

(C) β-Thalassemia

(D) Klinefelter's syndrome

List II:

(I) 11^{th} chromosome

(II) X chromosome

(III) 21^{st} chromosome

(IV) 16^{th} chromosome

Choose the correct answer from the options given below:

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

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

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

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

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

Solution:

Step 1: Identify the Chromosomal Abnormalities

- **Down's syndrome** is caused by trisomy of chromosome 21. - **α-Thalassemia** is associated with deletions on chromosome 16. - **β-Thalassemia** is linked to mutations on chromosome 11. - **Klinefelter's syndrome** is caused by the presence of an extra X chromosome (XXY).

Step 2: Match the Correct Chromosomes

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

Step 3: Conclusion

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

Quick Tip

Down's syndrome is caused by trisomy of chromosome 21, while Klinefelter's syndrome is caused by the presence of an extra X chromosome.

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

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

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

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

(A) A is not correct but R is correct

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

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

(D) A is correct but R is not correct

Correct Answer: (2) Both A and R are correct and R is the correct explanation of A

Solution:

Step 1: Evaluate Assertion A

Breast-feeding during the initial period is recommended by doctors because of its nutritional value and its ability to provide immunity.

Step 2: Evaluate Reason R

Colostrum, the first milk produced by the mother, contains essential antibodies that help the infant to develop immunity and resistance to infections.

Step 3: Conclusion

Since both Assertion A and Reason R are correct, and Reason R explains why breast-feeding is beneficial, the correct answer is **(2) Both A and R are correct and R is the correct

explanation of A**.

Quick Tip

Breast-feeding provides not just nutrition but also vital antibodies from colostrum to build the infant's immunity.

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169. Match List I with List II:

List I:

(A) Expiratory capacity

(B) Functional residual capacity

(C) Vital capacity

(D) Inspiratory capacity

List II:

(I) Expiratory reserve volume + Tidal volume + Inspiratory reserve volume

(II) Tidal volume + Expiratory reserve volume

(III) Tidal volume + Inspiratory reserve volume

(IV) Expiratory reserve volume + Residual volume

Choose the correct answer from the options given below:

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

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

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

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

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

Solution:

Step 1: Understand Respiratory Capacities

- **Expiratory capacity** is the sum of **expiratory reserve volume** and **tidal volume**, and includes the volume of air a person can forcefully exhale after normal exhalation. - **Functional residual capacity** is the sum of **residual volume** and **expiratory reserve volume**, representing the volume of air remaining in the lungs after normal exhalation. - **Vital capacity** is the sum of **tidal volume**, **inspiratory

reserve volume**, and **expiratory reserve volume**, representing the maximum volume of air a person can exhale after taking a deep breath. - **Inspiratory capacity** is the sum of **tidal volume** and **inspiratory reserve volume**, representing the maximum volume of air a person can inhale after normal inhalation.

Step 2: Match the Lists

- A-I: Expiratory capacity $\rightarrow$ Expiratory reserve volume + Tidal volume + Inspiratory reserve volume. - B-III: Functional residual capacity $\rightarrow$ Expiratory reserve volume + Residual volume. - C-II: Vital capacity $\rightarrow$ Tidal volume + Expiratory reserve volume. - D-IV: Inspiratory capacity $\rightarrow$ Tidal volume + Inspiratory reserve volume.

Step 3: Conclusion

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

Quick Tip

Vital capacity is one of the key measures of lung function, indicating the maximum amount of air a person can exhale after inhaling deeply.

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170. Match List I with List II:

List I (Sub Phases of Prophase I):

(A) Diakinesis

(B) Pachytene

(C) Zygotene

(D) Leptotene

List II (Specific Characters):

(I) Synaptonemal complex formation

(II) Completion of terminalisation of chiasmata

(III) Chromosomes look like thin threads

(IV) Appearance of recombination nodules

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-I, B-II, C-IV, D-III

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

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

Solution:

Step 1: Match the Sub Phases and Specific Characteristics

- **Diakinesis** → Completion of terminalisation of chiasmata (A-II). - **Pachytene** → Appearance of recombination nodules (B-IV). - **Zygotene** → Synaptonemal complex formation (C-I). - **Leptotene** → Chromosomes look like thin threads (D-III).

Step 2: Conclusion

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

Quick Tip

During prophase I of meiosis, chromosomes undergo synapsis and recombination to ensure genetic diversity.

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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 female and Leydig cells in male.

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

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

(1) A is false but R is true

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

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

(4) A is true but R is false

Correct Answer: (2) Both A and R are correct and R is the correct explanation of A

Solution:

Step 1: Evaluate Assertion A

FSH (Follicle Stimulating Hormone) stimulates the development of ovarian follicles in

females and the Leydig cells in males.

Step 2: Evaluate Reason R

Growing ovarian follicles indeed secrete estrogen, and interstitial cells (Leydig cells) secrete androgen in males.

Step 3: Conclusion

Both Assertion A and Reason R are correct, and Reason R explains why FSH is involved in hormone secretion in both males and females. Thus, the correct answer is **(2) Both A and R are correct and R is the correct explanation of A**.

Quick Tip

FSH plays a crucial role in regulating reproductive functions in both males and females by acting on the gonads.

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172. Given below are two statements:

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

Statement II: Female genital mutilation (FGM) is a procedure that involves the removal or alteration of female genitalia for non-medical reasons.

Choose the most appropriate answer from the options given below:

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

(B) Both Statement I and Statement II are true

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

(D) Both Statement I and Statement II are false

Correct Answer: (B) Both Statement I and Statement II are true

Solution:

Step 1: Evaluate Statement I

The presence or absence of hymen is not a reliable indicator of virginity because it can be affected by several non-sexual factors such as physical activity, injury, or medical procedures.

Step 2: Evaluate Statement II

Female genital mutilation (FGM) is a harmful practice that involves the partial or complete removal or alteration of female genitalia for non-medical reasons, usually as part of certain

cultural practices.

Step 3: Conclusion

Both statements are true. Therefore, the correct answer is **(B) Both Statement I and Statement II are true**.

Quick Tip

FGM is a human rights violation, and it is crucial to raise awareness about its dangers and the importance of protecting girls and women from this practice.

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173. 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) C, D E only

(2) A, B D only

(3) A, B E only

(4) B, C E only

Correct Answer: (3) A, B E only

Solution:

- **Myasthenia gravis** is an autoimmune disorder in which the immune system attacks the communication between nerves and muscles. - **Rheumatoid arthritis** is an autoimmune disorder that causes chronic inflammation in the joints. - **Gout** is not an autoimmune disorder; it is caused by the buildup of uric acid crystals in the joints. - **Muscular dystrophy** is a genetic disorder that affects muscle strength and function, but it is not autoimmune. - **Systemic Lupus Erythematosus (SLE)** is an autoimmune disease where the immune system attacks various parts of the body, including the skin, joints, and organs. Thus, the correct answer is **(3) A, B E only**.

Quick Tip

Autoimmune disorders occur when the body's immune system mistakenly attacks its own tissues, and they can affect various body parts including joints, muscles, and organs.

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174. 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) D only

(2) B only

(3) A only

(4) C only

Correct Answer: (3) A only

Solution:

Step 1: Evaluate each statement

- **Annelids** are true coelomates because they possess a well-developed body cavity lined by mesoderm. (**True**) - **Poriferans** (sponges) are not pseudocoelomates; they lack a body cavity entirely. (**False**) - **Aschelminthes** (Nematodes) are not acoelomates; they are pseudocoelomates, meaning they have a body cavity but it is not lined by mesoderm. (**False**) - **Platyhelminthes** (flatworms) are acoelomates, meaning they lack a body cavity. They are not pseudocoelomates. (**False**)

Step 2: Conclusion

Only **statement A** is correct. Thus, the correct answer is **(3) A only**.

Quick Tip

Coelomates have a body cavity completely lined by mesoderm, while pseudocoelomates have a body cavity partially lined with mesoderm. Acoelomates lack a body cavity.

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

Template Strand:

3’ TACATGGCAAATTACCATTCA 5’

(1) 5’ ATGTACCGTTTTAAGGTAAAGT3’

(2) 5’ AUGUACCGUUUUAAGGUAAAGU3’

(3) 5’ AUGUAAAUGUUUAUGGUAAGU3’

(4) 5’ AUGUACCGUUUUAAGGGAGU3’

Correct Answer: (2) 5’ AUGUACCGUUUUAAGGUAAAGU3’

Solution:

Step 1: Understand Transcription Process

DNA-dependent RNA polymerase synthesizes an mRNA strand complementary to the template DNA strand using the base-pairing rule: - Adenine (A) pairs with Uracil (U) in RNA. - Thymine (T) pairs with Adenine (A). - Cytosine (C) pairs with Guanine (G). - Guanine (G) pairs with Cytosine (C).

Step 2: Convert DNA to mRNA

Using the given DNA template strand (3’ TACATGGCAAATTACCATTCA 5’), the complementary mRNA strand will be:

$$5'AUGUACCGUUUUAAGGUAAAGU3'$$

This matches option **(2)**.

Step 3: Conclusion

The correct answer is **(2) 5’ AUGUACCGUUUUAAGGUAAAGU3’**.

Quick Tip

During transcription, the RNA strand is synthesized in the **5’ to 3’ direction**, complementary to the DNA template strand.

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

(1) Constant gene pool

(2) Genetic recombination

(3) Genetic drift

(4) Gene migration

Correct Answer: (1) Constant gene pool

Solution:

Step 1: Understanding Hardy-Weinberg Equilibrium

The Hardy-Weinberg principle states that the allele and genotype frequencies in a population remain constant over generations if evolutionary influences are absent.

Step 2: Analyzing the Given Options

- **Constant gene pool** ensures no evolutionary forces act, maintaining equilibrium. (**Correct Answer**) - **Genetic recombination** introduces variation, altering allele frequencies. (**Affects equilibrium**) - **Genetic drift** causes random fluctuations in allele frequencies, violating Hardy-Weinberg. (**Affects equilibrium**) - **Gene migration** leads to introduction/removal of alleles, disrupting equilibrium. (**Affects equilibrium**)

Step 3: Conclusion

Only **option (1) Constant gene pool** maintains Hardy-Weinberg equilibrium.

Quick Tip

Hardy-Weinberg equilibrium assumes **no mutation, no selection, no migration, no genetic drift, and random mating**.

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177. The "Ti plasmid" of *Agrobacterium tumefaciens* stands for:

(1) Temperature independent plasmid

(2) Tumour inhibiting plasmid

(3) Tumor independent plasmid

(4) Tumor inducing plasmid

Correct Answer: (4) Tumor inducing plasmid

Solution:

Step 1: Understanding Ti Plasmid

The **Ti (Tumor-inducing) plasmid** is a **circular DNA** found in *Agrobacterium tumefaciens*, a bacterium responsible for causing crown gall disease in plants.

Step 2: Function of the Ti Plasmid

- It carries **T-DNA** (Transfer DNA) which integrates into the plant genome. - This integration leads to uncontrolled cell division, resulting in tumors.

Step 3: Conclusion

Since the Ti plasmid **induces tumors** in plants, the correct answer is **option (4) Tumor inducing plasmid**.

Quick Tip

Ti plasmids are used in genetic engineering to transfer foreign genes into plants.

---

178. Given below are two statements:

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

Statement II: The proximal convoluted tubule is lined by simple columnar brush border epithelium and increases the surface area for reabsorption.

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

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

(2) Both Statement I and Statement II are true

(3) Both Statement I and Statement II are false

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

Correct Answer: (3) Both Statement I and Statement II are false

Solution:

Step 1: Analyze Statement I

- The **descending limb of Henle's loop** is **permeable to water** but **impermeable to electrolytes**. - Since Statement I incorrectly states that it is impermeable to water, it is **false**.

Step 2: Analyze Statement II

- The **proximal convoluted tubule (PCT)** is lined by **simple cuboidal** brush border epithelium, **not columnar**. - Since Statement II incorrectly states it is columnar, it is also **false**.

Step 3: Conclusion

Since both statements contain incorrect information, the correct answer is **option (3) Both Statement I and Statement II are false**.

Quick Tip

The **descending limb** of the nephron loop absorbs **water**, while the **ascending limb** absorbs **electrolytes**.

---

179. 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-I, C-III, D-II

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

(3) A-III, B-II, C-I, 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 Enzymes and Their Action

- **Lipase** breaks down lipids and hydrolyzes **ester bonds**.

- **Nuclease** cleaves nucleotides by hydrolyzing **phosphodiester bonds** in nucleic acids.

- **Protease** hydrolyzes **peptide bonds** in proteins.

- **Amylase** breaks down polysaccharides by hydrolyzing **glycosidic bonds**.

Step 2: Matching List-I and List-II

- **A-II** (Lipase → Ester bond)

- **B-IV** (Nuclease → Phosphodiester bond)

- **C-I** (Protease → Peptide bond)

- **D-III** (Amylase → Glycosidic bond)

Step 3: Conclusion

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

Quick Tip

Each enzyme targets a specific bond: Lipase (Ester), Nuclease (Phosphodiester), Protease (Peptide), and Amylase (Glycosidic).

---

180. 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-III, B-I, C-IV, D-II

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

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

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

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

Solution:

Step 1: Understanding Joint Types

- **Fibrous joints** are **immovable** and found in the **skull**.

- **Cartilaginous joints** allow **limited movement** and are present in the **vertebrae**.

- **Hinge joints** allow **one-directional movement** and are present in the **knee**.

- **Ball and socket joints** allow **free rotational movement** and are found in the

shoulder (humerus and pectoral girdle).

Step 2: Matching List-I and List-II

- **A-III** (Fibrous joints → Skull, no movement)

- **B-I** (Cartilaginous joints → Vertebrae, limited movement)

- **C-IV** (Hinge joints → Knee, helps in locomotion)

- **D-II** (Ball and socket joints → Humerus Pectoral girdle)

Step 3: Conclusion

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

Quick Tip

Fibrous joints are **immovable**, cartilaginous joints allow **limited movement**, hinge joints allow **one-directional movement**, and ball socket joints provide **maximum mobility**.

---

181. Following are the stages of 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 pathway from the options given below:

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

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

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

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

Correct Answer: (2) E-C-A-D-B

Solution:

Step 1: Understanding the Electrical Conduction System of the Heart

- The **SA node (E)** initiates the heartbeat and acts as the natural pacemaker.

- The electrical impulse moves to the **AV node (C)**, which delays the signal slightly.
- Then, the signal passes to the **AV bundle (A)**, also called the Bundle of His.
- From there, it travels to the **Bundle branches (D)** in the interventricular septum.
- Finally, the signal reaches the **Purkinje fibers (B)**, which help in ventricular contraction.

Step 2: Correct Sequence

- **E $\rightarrow$ C $\rightarrow$ A $\rightarrow$ D $\rightarrow$ B** matches option **(2)**.

Step 3: Conclusion

The correct answer is **option (2) E-C-A-D-B**.

Quick Tip

The correct sequence for heart conduction is: **SA node $\rightarrow$ AV node $\rightarrow$ AV bundle $\rightarrow$ Bundle branches $\rightarrow$ Purkinje fibers**.

---

182. Which of the following statements is incorrect?

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

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

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

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

Correct Answer: (4) Bio-reactors are used to produce small-scale bacterial cultures.

Solution:

Step 1: Understanding the Function of Bio-reactors

- **Bio-reactors** are designed for **large-scale production** of microbial, plant, and animal cell cultures.
- They provide **controlled conditions** like **temperature, pH, aeration, and mixing** to optimize microbial growth.

Step 2: Evaluating the Options

- **Statement 1** is correct (Bio-reactors have an agitator, oxygen delivery, and foam control systems).

- **Statement 2** is correct (Bio-reactors provide optimal growth conditions).
- **Statement 3** is correct (Most bio-reactors use stirring-type mechanisms).
- **Statement 4** is incorrect (Bio-reactors are used for large-scale, not small-scale production).

Step 3: Conclusion

The incorrect statement is **option (4) Bio-reactors are used to produce small-scale bacterial cultures**.

Quick Tip

Bio-reactors are **large-scale fermentation systems** that provide an optimal environment for **mass production** of microbial or cellular products.

---

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

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

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

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

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

Correct Answer: (3) The gene 'X' is responsible for controlling the copy number of the linked DNA and 'Y' for protein involved in the replication of Plasmid.

Solution: The 'X' gene controls the replication of linked DNA and the 'Y' gene encodes a protein essential for plasmid replication.

Quick Tip

In molecular biology, plasmids are used in genetic engineering as vectors to transfer genes into cells.

184. Match List I with 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-IV, B-I, C-II, D-III

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

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

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

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

Solution: - **A**: Common cold is caused by **Rhinoviruses** (III).

- **B**: Haemozoin is associated with **Plasmodium** (I).

- **C**: Widal test is used for **Typhoid** (II).

- **D**: Allergy is triggered by **Dust mites** (IV).

Thus, the correct answer is **option (4)**.

Quick Tip

Haemozoin is a byproduct of the breakdown of hemoglobin by Plasmodium in malaria infections.

185. Match List I with 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-II, B-I, C-IV, D-III

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

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

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

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

Solution: - **A**: Axoneme is associated with **Cilia and flagella** (II).

- **B**: Cartwheel pattern is seen in **Centriole** (I).

- **C**: Crista is found in **Mitochondria** (IV).

- **D**: Satellite is found on the **Chromosome** (III).

Thus, the correct answer is **option (1)**.

Quick Tip

Axonemes are the structural cores of cilia and flagella, composed of microtubules.

---

186. 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) B, C D only

(2) A C only

(3) A, B D only

(4) B, D E only

Correct Answer: (4) B, D E only

Solution: Non-chordates lack a notochord, post-anal tail, and have a dorsal heart if present.

Quick Tip

Non-chordates include species like arthropods and molluscs which do not possess the notochord.

---

187. 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:

(1) I^i/ii

(2) $|B|^i/I^A|/I^B$

(3) $|A|^I/|I^i|$

(4) ii/I^A/I^B

Correct Answer: (2) $|B|^i/I^A|/I^B$

Solution: Given the blood types, the possible genotypes are for the father I^B, mother I^A, and child I^i.

Quick Tip

The ABO blood group system is determined by the alleles I^A, I^B, and i. These are codominant, meaning that both I^A and I^B are expressed when inherited.

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188. Match List I with List II :

List I	List II
A. Mesozic 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-IV, D-II

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

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

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

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

Solution: - Mesozic Era refers to the time period characterized by the development of reptiles, which is associated with the Birds & Reptiles (III). - Proterozoic Era refers to the emergence of simple life forms like lower invertebrates (I). - Cenozoic Era marks the time of Mammals (IV). - Paleozoic Era corresponds to the Fish & Amphibia (II).

Quick Tip

The geological eras are divided into the Hadean, Archean, Proterozoic, and Phanerozoic eons. Each of these eons represents major developments in life forms.

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189. 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-IV, B-I, C-II, D-III

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

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

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

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

Solution: - The P wave corresponds to depolarisation of atria (III). - The QRS complex corresponds to depolarisation of ventricles (II). - The T wave corresponds to repolarisation of ventricles (IV). - The T-P gap represents the heart muscles being electrically silent (I).

Quick Tip

The P wave, QRS complex, and T wave are the key components in an ECG (electrocardiogram) tracing, which helps in understanding heart function.

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190. 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 eye balls.

D. Cretinism IV. Excessive secretion of growth hormone.

Choose the correct answer from the options given below:

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

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

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

(4) A-III, B-VI, C-I, D-I

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

Solution:

- A. Exophthalmic goiter is related to excessive secretion of thyroid hormone which leads to protruding eyeballs (III). - B. Acromegaly is due to excessive secretion of growth hormone (IV). - C. Cushing's syndrome is related to the excess secretion of cortisol, leading to moon face and hyperglycemia (I). - D. Cretinism is associated with hypothyroidism, causing stunted growth and dwarfism (II).

Quick Tip

Excessive secretion of growth hormone leads to conditions like acromegaly, while insufficient secretion results in conditions such as cretinism.

---

191. Given below are two statements:

Statement I: Mitochondria and chloroplasts both have double membranes bound organelles.

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

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

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

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

(3) Both Statement I and Statement II are incorrect.

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

Correct Answer: (4) Statement I is correct but Statement II is incorrect.

Solution:

- Statement I is correct: Both mitochondria and chloroplasts are double-membraned organelles. - Statement II is incorrect: The inner membrane of mitochondria is less permeable than the inner membrane of chloroplasts.

Quick Tip

Mitochondria and chloroplasts are essential organelles with unique roles in energy production. Their inner membranes play a crucial role in these processes, and their structure reflects their specialized functions.

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192. 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) E, D, C, B, A

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

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

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

Correct Answer: (2) A, E, D, C, B

Solution:

The correct sequence of catalytic cycle for an enzyme is: 1. Substrate enzyme complex formation (A), 2. Substrate binding to active site (E), 3. Chemical bonds of the substrate are broken (D), 4. Release of products (C), 5. Free enzyme is ready to bind with another substrate (B).

Quick Tip

The catalytic cycle involves binding of substrate to the enzyme, breaking the chemical bonds, and releasing the products, leaving the enzyme ready for another cycle.

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193. 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-IV, D-III

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

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

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

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

Solution:

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

Quick Tip

Unicellular glandular epithelium, like goblet cells, secrete mucus, while multicellular glands like salivary glands secrete digestive enzymes and other substances.

194.

Choose the correct statement given below regarding juxta medullary nephron.

(1) Juxta medullary nephrons outnumber the cortical nephrons.

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

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

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

Correct Answer: (4) Loop of Henle of juxta medullary nephron runs deep into medulla.

Solution: Juxta medullary nephrons have longer loops of Henle that extend into the medulla. This is important for maintaining the osmotic gradient necessary for urine concentration. The renal corpuscle of juxta medullary nephrons is located near the medulla, which allows the loops of Henle to run deeper into the medulla.

Quick Tip

The juxta medullary nephrons play a crucial role in regulating water and salt balance, especially in conserving water through the process of countercurrent multiplication.

195.

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 micro-environments for the development and maturation of T-lymphocytes.

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

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

(3) Both Statement I and Statement II are incorrect.

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

Correct Answer: (2) Both Statement I and Statement II are correct.

Solution: Bone marrow is indeed the primary site for the production of all blood cells, including lymphocytes. Additionally, the thymus provides the micro-environment needed for the maturation of T-lymphocytes, which is crucial for the adaptive immune system.

Quick Tip

The thymus plays a central role in the maturation of T-lymphocytes by providing a specialized environment where these cells undergo positive and negative selection.

196.

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

(A) The structures used for storing of food

(B) Ring of 6-8 blind tubules at junction of foregut and midgut.

(C) Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut.

(D) The structures used for grinding the food.

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

Solution: - The structures used for storing food in cockroaches are found in the **Crop**, corresponding to (D).

- The **Ring of 6-8 blind tubules at junction of foregut and midgut** is known as the **Gastric Caeca**, corresponding to (B).

- The **Ring of 100-150 yellow colored thin filaments** are the **Malpighian tubules**, corresponding to (C).

- The **Structures used for grinding food** are found in the **Gizzard**, corresponding to (A).

Quick Tip

In cockroaches, the digestive system plays an essential role in breaking down food using specialized structures like the crop, gizzard, and gastric caeca.

197.

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.

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

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

(3) Both Statement I and Statement II are incorrect.

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

Correct Answer: (4) Statement I is correct but Statement II is incorrect.

Solution: - Statement I is correct because the cerebral hemispheres are indeed connected by

a nerve tract called the **corpus callosum**.

- Statement II is incorrect because the brainstem consists of the **medulla oblongata, pons, and midbrain**, not the cerebrum.

Quick Tip

The brainstem regulates vital functions like heart rate and breathing, while the cerebrum is involved in higher brain functions such as thought, movement, and sensory processing.

198.

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.

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

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

(3) Both Statement I and Statement II are incorrect.

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

Correct Answer: (1) Statement I is false but Statement II is true.

Solution: - Statement I is incorrect because Gause's principle actually states that two closely related species competing for the same limiting resources cannot coexist indefinitely, not for different resources. - Statement II is correct because it aligns with Gause's principle, where the inferior species gets eliminated under competitive pressure.

Quick Tip

In competitive exclusion, two species competing for the same niche cannot coexist. One will inevitably outcompete the other.

199.

Match List I with List II: List I A. RNA polymerase III

B. Termination of transcription

C. Splicing of Exons

D. TATA box

List II I. snRNPs

II. Promoter

III. Rho factor

IV. SnRNAs, tRNA

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

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

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

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

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

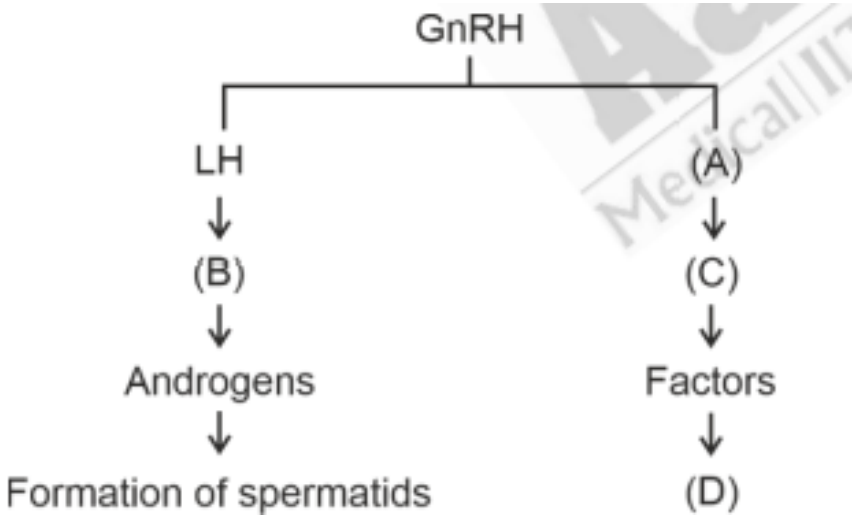
Solution: - RNA polymerase III is responsible for transcribing small RNAs, corresponding to (A-IV). - Termination of transcription involves the **Rho factor**, which is involved in termination, corresponding to (B-III). - Splicing of exons involves snRNPs, which play a role in splicing, corresponding to (C-I). - The TATA box is a crucial promoter element in gene transcription, corresponding to (D-II).

Quick Tip

The TATA box is an essential DNA sequence involved in the binding of RNA polymerase and initiation of transcription.

200.

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



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

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

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

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

Correct Answer: (2) FSH, Leydig cells, Sertoli cells, spermatogenesis.

Solution: - The hormonal regulation of spermatogenesis involves GnRH (Gonadotropin-releasing hormone) stimulating the release of LH (Luteinizing hormone) and FSH (Follicle-stimulating hormone). - LH acts on Leydig cells to produce androgens, which are necessary for spermatogenesis. - FSH, on the other hand, acts on Sertoli cells, supporting the maturation of spermatids.

Quick Tip

FSH and LH regulate different aspects of spermatogenesis. FSH acts on Sertoli cells to nourish the developing sperm, while LH stimulates Leydig cells to produce androgens, essential for sperm development.
