NEET 2024 S2 Zoology

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

151. Match List I with List II:

List I	**List II**
A. α–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-II, B-I, C-V, D-III

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

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

Solution: A: α-I antitrypsin is related to Emphysema (due to deficiency leading to lung damage). B: Cry IAb is associated with controlling Cotton bollworm. C: Cry IAc is associated with controlling Corn borer. D: Enzyme replacement therapy is used in treating ADA deficiency (Adenosine Deaminase deficiency).

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

Cry proteins are toxins produced by Bacillus thuringiensis, which are used as biopesticides, effective against specific pests like cotton bollworms and corn borers.

152. Which of the following is not a component of Fallopian tube? (1) Ampulla

(2) Uterine fundus

(3) Isthmus

(4) Infundibulum

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

Correct Answer: (2)

Quick Tip

The Fallopian tube is involved in the transport of the egg from the ovary to the uterus and consists of four parts: infundibulum, ampulla, isthmus, and interstitial part.

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153. The ”Ti plasmid” of Agrobacterium tumefaciens stands for: (1) Temperature independent plasmid

(2) Tumour inhibiting plasmid

(3) Tumor independent plasmid

(4) Tumor inducing plasmid

Solution: The Ti plasmid (Tumor inducing plasmid) of *Agrobacterium tumefaciens* is responsible for causing crown gall disease in plants by transferring genes that lead to tumor formation.

Correct Answer: (4)

Quick Tip

The Ti plasmid is used in genetic engineering for creating genetically modified plants, as it can transfer specific genes to plant cells, causing tumor growth.

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154. 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

Solution: The constant gene pool is one of the conditions for Hardy-Weinberg equilibrium. All other factors such as genetic recombination, genetic drift, and gene migration can lead to deviations from the equilibrium.

Correct Answer: (1)

Quick Tip

The Hardy-Weinberg equilibrium assumes that no evolution occurs in a population, which means factors like mutation, migration, and genetic drift must not affect allele frequencies.

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155. 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 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

Solution: The correct pathway for conduction of an action potential in the heart is: SA node $\rightarrow$ AV node $\rightarrow$ AV bundle $\rightarrow$ Bundle branches $\rightarrow$ Purkinje fibres.

Thus, the correct answer is (2).

Correct Answer: (2)

Quick Tip

The conduction pathway ensures that the heart beats in a coordinated manner. The action potential travels from the SA node to the AV node, then through the AV bundle, bundle branches, and Purkinje fibres to trigger the heart's contraction.

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156. Given below are two statements:

Statement I: In the nephron, the descending limb of 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) 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

Solution: Statement I is incorrect because the descending limb of the loop of Henle is permeable to water, not to electrolytes. Statement II is correct because the proximal convoluted tubule is lined with simple cuboidal epithelium with microvilli, which increases the surface area for reabsorption.

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

Correct Answer: (3)

Quick Tip

The descending limb of the loop of Henle is permeable to water and allows for water reabsorption, while the ascending limb is impermeable to water but allows the transport of ions.

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157. Match List I with List II:

List I	**List II**
A. Down's syndrome	I. 11^{th} chromosome

B. α-Thalassemia II. X chromosome

C. β-Thalassemia III. 21^{st} chromosome

D. Klinefelter's syndrome IV. 16^{th} chromosome

Choose the correct answer from the options given below: (1) A-IV, B-I, C-II, D-III

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

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

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

Solution: A: Down's syndrome is caused by an extra copy of chromosome 21. B: α-Thalassemia is caused by mutations on chromosome 16. C: β-Thalassemia is caused by mutations on chromosome 11. D: Klinefelter's syndrome is caused by the presence of an extra X chromosome.

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

Chromosomal abnormalities such as Down's syndrome, Klinefelter's syndrome, and thalassemia are often caused by mutations or aneuploidy in specific chromosomes.

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158. 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) A-D-C-B

(2) D-A-C-B

(3) B-A-D-C

(4) C-B-D-A

Solution: The correct sequence of human evolution is: Homo habilis → Homo erectus → Homo neanderthalensis → Homo sapiens.

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

Human evolution progressed from early hominins like Homo habilis, to more advanced species like Homo sapiens, with intermediary species such as Homo erectus and Homo neanderthalensis.

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159. The flippers of the Penguins and Dolphins are the example of: (1) Divergent evolution

(2) Adaptive radiation

(3) Natural selection

(4) Convergent evolution

Solution: The flippers of Penguins and Dolphins are an example of **convergent evolution** because they have evolved similar structures due to similar environmental pressures, despite having different evolutionary origins.

Correct Answer: (4)

Quick Tip

Convergent evolution occurs when unrelated species evolve similar traits due to similar selective pressures, such as the flippers of penguins and dolphins adapted for swimming.

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160. Match List I with List II:

List I	**List II**
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-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-I, C-III, D-IV

Solution: A: Diakinesis is associated with the appearance of recombination nodules. B: Pachytene is associated with the completion of terminalisation of chiasmata. C: Zygotene is the stage when chromosomes look like thin threads. D: Leptotene is the stage of synaptonemal complex formation.

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

Meiosis consists of several stages, including Leptotene, Zygotene, Pachytene, and Diakinesis, each characterized by specific chromosomal events and structures.

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161. Match List I with List II:

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

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

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

Solution: A: Typhoid is caused by Bacteria. B: Leishmaniasis is caused by Protozoa. C: Ringworm is caused by a Fungus. D: Filarisis is caused by a Nematode.

Thus, the correct answer is (3).

Correct Answer: (3)

Quick Tip

Typhoid, Leishmaniasis, Ringworm, and Filarisis are caused by different types of pathogens: bacteria, protozoa, fungi, and nematodes, respectively.

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162. 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-I, C-III, D-IV

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

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

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

Solution: A: Pons connects different regions of the brain. B: Hypothalamus has neurosecretory cells. C: Medulla controls respiration and gastric secretions. D: Cerebellum provides additional space for neurons, regulates posture and balance.

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

The brain regions such as the Pons, Hypothalamus, Medulla, and Cerebellum play critical roles in body functions like movement coordination, respiratory control, and homeostasis.

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

3' TACATGGCAATATTCATCTTCA 5'

(1) 5' ATGACCGTTTATGGTAGTATG 3'

(2) 5' AUGUAAAGUUAAGGUAAGAGUG 3'

(3) 5' AUGUAAAGUUUAGGGAAAGGU 3'

(4) 5' AUGUACGGUUUAAAGGGAAGU 3'

Solution: The RNA polymerase will read the template strand and synthesize the complementary RNA strand in the 5' to 3' direction. The complementary strand of the given template would be 5' AUGUAAAGUUUAGGGAAAGGU 3'.

Correct Answer: (3)

Quick Tip

RNA polymerase synthesizes RNA in the 5' to 3' direction by complementary base pairing with the template DNA strand.

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164. Match List I with List II:

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

Choose the correct answer from the options given below: (1) A-III, B-I, C-II, D-IV

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

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

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

Solution: A: Pterophyllum is associated with Angel fish. B: Myxine is associated with Hag fish. C: Pristis is associated with Saw fish. D: Exocoetus is associated with Flying fish.

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

Pterophyllum is a species of freshwater fish commonly known as the Angelfish, Myxine is known as the Hagfish, Pristis refers to the Sawfish, and Exocoetus is known as the Flying fish.

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165. 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

Solution: Annelids are true coelomates, while Poriferans, Aschelminthes, and Platyhelminthes have different types of body cavities, with Aschelminthes being acoelomates and Platyhelminthes being pseudocoelomates.

Thus, the correct answer is (3).

Correct Answer: (3)

Quick Tip

Annelids are true coelomates, meaning they possess a true coelom. Poriferans do not have a proper body cavity, and Aschelminthes and Platyhelminthes are examples of pseudocoelomates.

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

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

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

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

Solution: A: Common cold is caused by Rhinoviruses. B: Haemozoin is associated with Plasmodium, the malaria parasite. C: Widal test is used for diagnosing Typhoid. D: Allergy is caused by Dust mites.

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

Common cold is caused by Rhinoviruses, and Malaria is caused by Plasmodium, with Haemozoin being a byproduct of the parasite. Widal test is used for diagnosing Typhoid, and Dust mites are common allergens causing allergies.

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167. 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

Solution: Bio-reactors are typically used to produce large-scale cultures, not small-scale cultures.

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

Bio-reactors are essential in biotechnology for growing microorganisms on a large scale for the production of various products like medicines, enzymes, and biofuels.

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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: FSH acts upon ovarian follicles in female and Leydig cells in male. Reason R: Growing ovarian follicles secrete estrogen in female while interstitial cells secrete androgen in male human being.

In the light of the above statements, choose the correct answer from the options given below: (1) A is false but R is true

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

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

(4) A is true but R is false

Solution: Assertion A is false because FSH acts on ovarian follicles in females but is not involved in Leydig cells in males. Reason R is true because ovarian follicles secrete estrogen in females, and Leydig cells secrete androgen in males.

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

FSH plays a key role in the reproductive system by stimulating the development of ovarian follicles in females and controlling testosterone production in males.

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169. Following are the stages of cell division:

A. Gap 2 phase

B. Cytokinesis

C. Synthesis phase

D. Karyokinesis

E. Gap 1 phase

Choose the correct sequence of stages from the options given below: (1) E-C-A-D-B

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

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

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

Solution: The correct sequence of stages in cell division is: Gap 1 phase $\rightarrow$ Synthesis phase $\rightarrow$ Gap 2 phase $\rightarrow$ Karyokinesis $\rightarrow$ Cytokinesis.

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

The stages of cell division follow a specific order: G1 phase (preparation), S phase (DNA replication), G2 phase (further preparation), followed by M phase (mitosis and cytokinesis).

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170. 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) 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

Solution: Statement I is true because the presence or absence of the hymen is not a definitive indicator of virginity. Statement II is false because the hymen can be torn due to various reasons other than the first coitus, such as physical activity or medical procedures.

Thus, the correct answer is (4).

Correct Answer: (4)

Quick Tip

The hymen may be stretched or torn due to reasons unrelated to sexual activity, making it an unreliable marker of virginity.

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

(1) Vaults

(2) Coitus interruptus

(3) Periodic abstinence

(4) Lactational amenorrhea

Solution: **Vaults** are not a natural or traditional contraceptive method. Vaults refer to a type of contraceptive device, not a traditional or natural method.

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

Natural contraceptive methods include coitus interruptus, periodic abstinence, and lactational amenorrhea. Vaults, however, refer to an artificial method of contraception.

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

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

Solution: A: Fibrous joints are found in the skull and do not allow movement (III). B: Cartilaginous joints are found between adjacent vertebrae and allow limited movement (I). C: Hinge joints are found in the knee and elbow and help in movement (IV). D: Ball and socket joints are found in the shoulder and hip, allowing rotational movement (II).

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

Joints are classified based on their structure and function. Ball and socket joints provide the most movement, while fibrous joints offer minimal movement.

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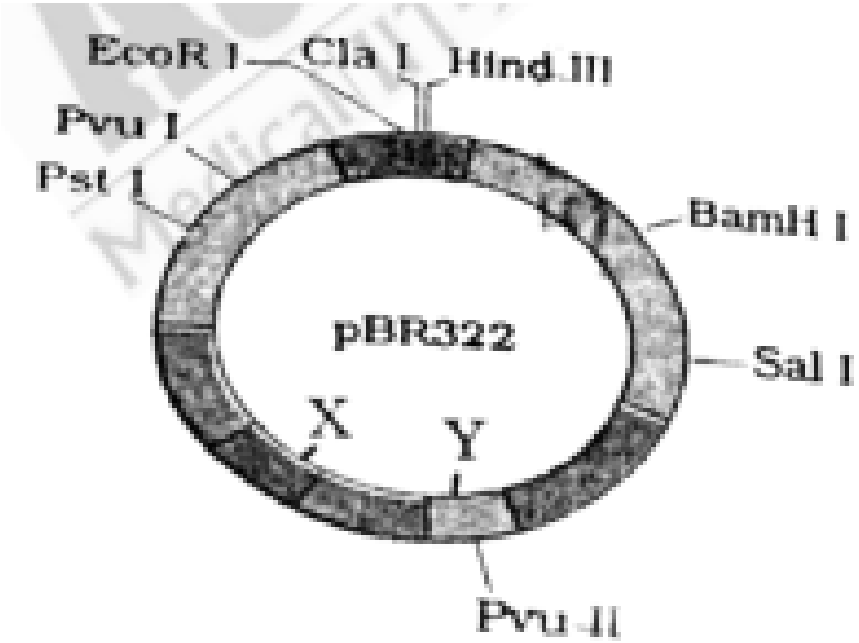
173. The following diagram showing restriction sites in E. coli cloning vector pBR322. Find the role of 'X' and 'Y' genes:



(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.

Solution: The gene 'X' controls the copy number of the linked DNA and gene 'Y' is involved in protein production necessary for plasmid replication.

Thus, the correct answer is (3).

Correct Answer: (3)

Quick Tip

Plasmid vectors are used for cloning DNA and often contain genes for antibiotic resistance and replication control.

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174. Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli? (1) Low pCO and High temperature

(2) High pCO and High pO

(3) High pCO and Lesser H concentration

(4) Low pCO and High H concentration

Solution: The formation of oxyhaemoglobin is favoured by low pCO and high pO, which occurs in the alveoli where oxygen binds to haemoglobin for transport.

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

Correct Answer: (4)

Quick Tip

In the alveoli, high oxygen levels and low carbon dioxide levels favour the binding of oxygen to haemoglobin, forming oxyhaemoglobin.

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175. In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on: (1) 11^{th} segment

(2) 5^{th} segment

(3) 10^{th} segment

(4) 8^{th} and 9^{th} segment

Solution: The anal cerci in cockroaches are present on the **10^{th} segment**.

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

Correct Answer: (3)

Quick Tip

Anal cerci in cockroaches serve sensory functions, helping to detect air currents and vibrations.

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176. 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-IV, D-II

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

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

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

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

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

IUDs are popular methods of contraception, and the different types include copper-releasing and hormone-releasing IUDs, as well as non-medicated devices like the Lippes loop.

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177. Match List I with List II:

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

Choose the correct answer from the options given below: (1) A-I, B-III, C-IV, D-II

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

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

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

Solution: A: Expiratory capacity is Expiratory reserve volume + Tidal volume + Inspiratory reserve volume (I). B: Functional residual capacity is Tidal volume + Expiratory reserve volume (II). C: Vital capacity is Tidal volume + Inspiratory reserve volume (III). D: Inspiratory capacity is Expiratory reserve volume + Residual volume (IV).

Thus, the correct answer is (2).

Correct Answer: (2)

Quick Tip

Respiratory volumes and capacities describe different aspects of lung function and ventilation. They are useful in assessing the health of the lungs.

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

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

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

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

Solution: A: Pleurobrachia is associated with Ctenophora (II). B: Radula is associated with Mollusca (I). C: Stomochord is found in Hemichordata (IV). D: Air bladder is found in Osteichthyes (III).

Thus, the correct answer is (3).

Correct Answer: (3)

Quick Tip

Pleurobrachia is a member of the phylum Ctenophora, which includes marine invertebrates. The radula is a specialized feeding organ found in mollusks.

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179. 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

Solution: Myasthenia gravis, Rheumatoid arthritis, and Systemic Lupus Erythematosus (SLE) are autoimmune disorders. Gout and Muscular dystrophy are not considered autoimmune disorders.

Thus, the correct answer is (3).

Correct Answer: (3)

Quick Tip

Autoimmune diseases occur when the body's immune system mistakenly attacks its own tissues. Conditions like rheumatoid arthritis and lupus are classic examples.

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180. 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. Erythroxylum
D. Marijuana	IV. Papaver somniferum

Choose the correct answer from the options given below: (1) A-III, B-IV, C-I, D-II

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

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

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

Solution: A: Cocaine is obtained from Erythroxylum (III). B: Heroin is obtained from Papaver somniferum (IV). C: Morphine is obtained from Papaver somniferum (IV). D: Marijuana is obtained from Cannabis sativa (II).

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

Cocaine, heroin, and morphine are all drugs derived from plant sources, while marijuana comes from Cannabis sativa. Morphine is often used in medical practice for its pain-relieving properties.

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

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

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

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

Solution: A: Axoneme is a structure found in Cilia and flagella (II). B: Cartwheel pattern is found in the Centriole (I). C: Crista is found in Mitochondria (IV). D: Satellite is associated with Chromosome (III).

Thus, the correct answer is (1).

Correct Answer: (1)

Quick Tip

The axoneme is the central shaft of cilia and flagella and is involved in movement. Cristae are folds in the inner mitochondrial membrane, important for energy production in mitochondria.

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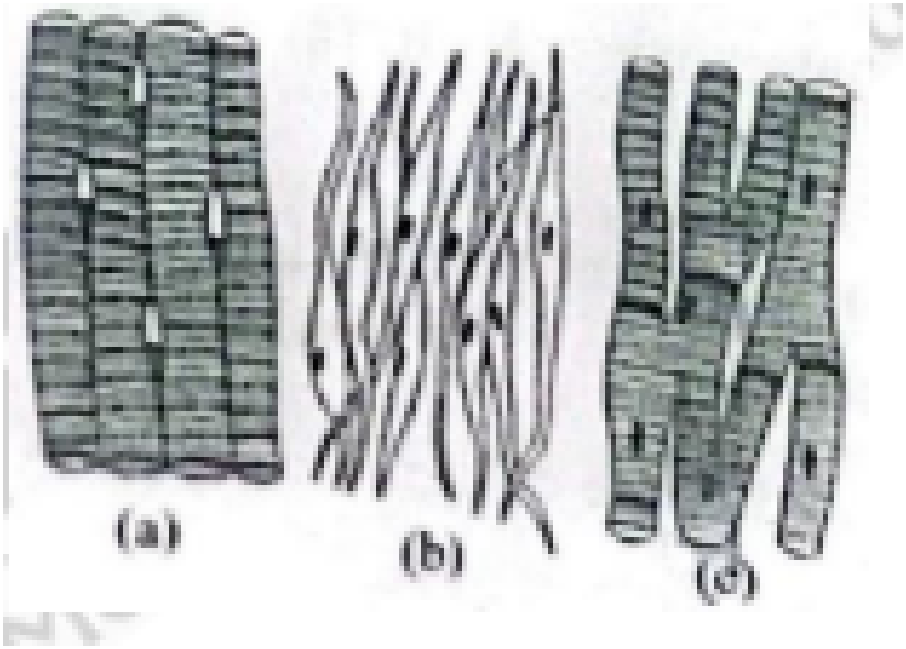
183. Three types of muscles are given as a, b, c. Identify the correct matching pair along with their location in the human body:



Name of muscle/location	**(1)**	**(3)**
(a) Involuntary - Nose tip	(a) Involuntary - Nose tip	(a) Skeletal – Triceps
(b) Skeletal - Bone	(b) Skeletal - Bone	(b) Smooth – Stomach
(c) Cardiac - Heart	(c) Cardiac - Heart	(c) Skeletal – Biceps

Choose the correct answer from the options given below: (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) Skeletal - Biceps

(4) (a) Involuntary - Intestine, (b) Skeletal - Biceps, (c) Smooth - Heart

Solution: - **Involuntary muscle** is found in the **nose tip** (a). - **Skeletal muscle** is found in the **legs** (b). - **Cardiac muscle** is found in the **heart** (c).

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

Correct Answer: (2)

Quick Tip

Involuntary muscles are not under conscious control and are found in structures such as the heart, stomach, and intestines. Skeletal muscles are responsible for voluntary movement and are attached to bones.

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184. Match List I with List II:

List-I	**(1)**	**(2)**
A. Lipase	I. Peptide bond	[illegible] bond

Choose the correct answer from the options given below: (1) A-IV, B-I, C-III, D-II (2) A-IV, B-II, C-III, D-I (3) A-III, B-II, C-I, D-IV (4) A-II, B-IV, C-I, D-III

Answer: (4)

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

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

Quick Tip

Enzymes are proteins that catalyze biochemical reactions. Each enzyme has a specific substrate and bond type it acts upon, such as ester, phosphodiester, peptide, or glycosidic bonds.

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185. Which of the following is not a steroid hormone? (1) Glucagon

(2) Cortisol

(3) Testosterone

(4) Progesterone

Answer: (1)

Solution: - Glucagon is a peptide hormone, not a steroid hormone. - Cortisol, testosterone, and progesterone are all steroid hormones.

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

Quick Tip

Steroid hormones are derived from cholesterol and are lipophilic, meaning they can pass through cell membranes. Examples include cortisol, testosterone, and progesterone.

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

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

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

Answer: (2)

Solution: The correct sequence of the catalytic cycle is: - E. Substrate binding to active site. - A. Substrate enzyme complex formation. - D. Chemical bonds of the substrate broken. - C. Release of products. - B. Free enzyme ready to bind with another substrate.

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

Quick Tip

The catalytic cycle of an enzyme involves the binding of the substrate to the enzyme, the breaking of substrate bonds, release of products, and the enzyme becoming available to bind to a new substrate.

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187. Given below are two statements: Statement I: Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced.

Statement II: Both bone marrow and thymus provide microenvironments for the development and maturation of T-lymphocytes.

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

below: (1) 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.

Answer: (2)

Solution: - Statement I is correct as bone marrow is indeed the primary site of blood cell production, including lymphocytes. - Statement II is also correct as both the bone marrow and thymus are involved in the development and maturation of T-lymphocytes.

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

Quick Tip

Bone marrow is responsible for the production of blood cells, including lymphocytes, whereas the thymus provides the environment for the maturation of T-lymphocytes.

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188. Match List I with List II:

List I	**(1)**	**(2)**
A. Exophthalmic goiter	III. Excess secret	balls

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

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

Answer: (1)

Solution: - Exophthalmic goiter is caused by **hypersecretion of thyroid hormone** and protruding eye balls (A-III). - Acromegaly is caused by **excessive secretion of growth hormone** (B-IV). - Cushing's syndrome is caused by **excess secretion of cortisol, moon face, and hyperglycemia** (C-I). - Cretinism is caused by **hyposecretion of thyroid hormone** leading to stunted growth (D-II).

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

Quick Tip

Endocrine disorders can be caused by both hypersecretion and hyposecretion of hormones. These disorders can lead to various symptoms such as stunted growth, protruding eye balls, or excessive facial changes.

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189. Match List I with List II:

List I	**(1)**	**(3)**
A. RNA polymerase II	I. snRNPs	[illegible] transcription

Choose the correct answer from the options given below: (1) A-IV, B-III, C-II, D-I

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

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

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

Answer: (1)

Solution: - RNA polymerase II is involved in **snRNPs** (A-IV). - Termination of transcription is regulated by the **Rho factor** (B-III). - Splicing of Exons involves **snRNAs, tRNA** (C-II). - The TATA box is associated with the **promotor** (D-I).

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

Quick Tip

In gene expression, RNA polymerase II is responsible for transcription, while splicing and termination involve specific RNA sequences and proteins like snRNAs, tRNA, and Rho factor.

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190. Given below are two statements: Statement I: The cerebral hemispheres are connected by nerve tract known as corpus callosum.

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

In the light of 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.

Answer: (4)

Solution: - Statement I is correct: The cerebral hemispheres are indeed connected by the nerve tract known as the corpus callosum. - Statement II is incorrect: The brainstem consists of the medulla oblongata, pons, and **midbrain** (not cerebrum).

Thus, the correct answer is (4).

Quick Tip

The corpus callosum connects the left and right cerebral hemispheres, and the brainstem includes the medulla oblongata, pons, and midbrain, not the cerebrum.

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191. Match List I with List II:

List I	**(1)**	**(3)**
A. Unicellular glandular epi	Salivary gland	m

Choose the correct answer from the options given below: (1) A-II, B-I, C-IV, D-III

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

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

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

Answer: (4)

Solution: - Unicellular glandular epithelium is found in **Goblet cells of alimentary canal** (A-III). - Compound epithelium is found in **Moist surface of buccal cavity** (B-IV). - Multicellular glandular epithelium is found in **Salivary glands** (C-I). - Endocrine glandular epithelium is found in **Pancreas** (D-II).

Thus, the correct answer is (4).

Quick Tip

Unicellular epithelium forms structures like goblet cells, while multicellular epithelium forms glands such as salivary glands and the pancreas. Endocrine glands secrete hormones and are important for metabolic regulation.

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193. Given below are two statements: Statement I: Mitochondria and chloroplasts both double membranes around organelles.

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

In the light of the 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.

Answer: (4)

Solution: - Statement I is correct: Both mitochondria and chloroplasts have double membranes. - Statement II is incorrect: The inner membrane of mitochondria is more impermeable compared to chloroplasts, not less.

Thus, the correct answer is (4).

Quick Tip

Mitochondria and chloroplasts both contain double membranes, but the permeability of the inner membranes differs. The inner mitochondrial membrane is relatively less permeable compared to the chloroplast membrane.

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

List I	**(1)**	**(3)**
A. The structures used for st	ing	

Choose the correct answer from the options given below: (1) A-III, B-II, C-IV, D-I

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

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

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

Answer: (2)

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

Thus, the correct answer is (2).

Quick Tip

In the digestive system of a cockroach, the crop is used for food storage, gastric caeca help in digestion, Malpighian tubules aid in excretion, and the gizzard grinds the food.

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195. 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 most appropriate 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 incorrect.

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

Answer: (1)

Solution: - Statement I is false because Gause's principle states that two species may compete for the same resource, but one may be more efficient, thus driving the other to extinction. - Statement II is true, as competition can result in the elimination of the inferior species if

resources are limited.

Thus, the correct answer is (1).

Quick Tip

Gause's competitive exclusion principle states that no two species can occupy the same ecological niche indefinitely when resources are limited. One species will eventually outcompete the other.

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196. 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 and D only

(2) A and C only

(3) A, B and D only

(4) B, D and E only

Answer: (4)

Solution: - Statement A: Pharynx with gill slits is a characteristic of some non-chordates like amphibians and fishes. - Statement B: Notochord is absent in many non-chordates such as arthropods and molluscs. - Statement C: The central nervous system is dorsal in most non-chordates. - Statement D: The heart is dorsal if present in some non-chordates like arthropods. - Statement E: Post-anal tail is absent in non-chordates like arthropods.

Thus, the correct answer is (4).

Quick Tip

Non-chordates lack the notochord and may have a dorsal heart. Additionally, many lack a post-anal tail and have gill slits at some stage in their life cycle.

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197. 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^B

B. I^A I^B

C. I^A I^A

D. I^B I^O

E. I^A I^O

Choose the most appropriate answer from the options given below: (1) D E only

(2) A only

(3) B only

(4) C B only

Answer: (2)

Solution: - The father has a B^+ blood group, meaning his genotype is I^B I^O. - The mother has an A^+ blood group, meaning her genotype is I^A I^O. - The child has an O^- blood group, meaning their genotype must be I^O I^O.

Thus, the correct answer is (2).

Quick Tip

The ABO blood type is determined by alleles I^A, I^B, and I^O. For a child with O^- blood group, both parents must carry the I^O allele.

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198. 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.

Answer: (4)

Solution: - Statement (1) is incorrect: Cortical nephrons are more abundant than juxta medullary nephrons. - Statement (2) is incorrect: Juxta medullary nephrons are located near the junction of the cortex and medulla, not in the columns of Bertini. - Statement (3) is incorrect: The renal corpuscle of juxta medullary nephron lies in the outer portion of the cortex, not the renal

medulla. - Statement (4) is correct: The Loop of Henle of juxta medullary nephrons extends deep into the medulla, which is crucial for concentrating urine.

Thus, the correct answer is (4).

Quick Tip

Juxta medullary nephrons play an important role in the formation of concentrated urine. The deep penetration of the Loop of Henle into the medulla enables the kidney to conserve water.

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

GnRH $\longrightarrow$ LH $\longrightarrow$ (A)FSH $\longrightarrow$ (B) $\longrightarrow$ (C)Androgens $\longrightarrow$ (D) $\longrightarrow$ Forn

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

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

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

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

Answer: (2)

Solution: - (A) refers to ICSH (Interstital Cell Stimulating Hormone) acting on Leydig cells to produce androgens. - (B) refers to FSH stimulating Sertoli cells. - (C) refers to the role of Sertoli cells in supporting spermiogenesis. - (D) refers to the final formation of spermatozoa.

Thus, the correct answer is (2).

Quick Tip

GnRH from the hypothalamus stimulates the release of LH and FSH from the pituitary, which in turn stimulate Leydig cells and Sertoli cells to facilitate spermatogenesis and spermiogenesis.

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200. Match List I with List II:

List I	**(1)**	**(2)**
A. P wave	I. Heart muscles	[illegible] ventricles.

Choose the correct answer from the options given below: (1) A-IV, B-II, C-I, D-III

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

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

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

Answer: (3)

Solution: - P wave corresponds to **depolarisation of atria** (A-III). - QRS complex corresponds to **depolarisation of ventricles** (B-II). - T wave corresponds to **repolarisation of ventricles** (C-I). - T-P gap corresponds to **heart muscles are electrically silent** (D-IV).

Thus, the correct answer is (3).

Quick Tip

The P wave, QRS complex, and T wave are part of the electrocardiogram (ECG) that represents the electrical activity of the heart. The T-P gap represents the phase when the heart muscles are electrically silent.
