1 (Sem–4) ZLG 2

2025

ZOOLOGY

Paper : ZLG0400204

(Animal Physiology and Endocrinology)

Full Marks : 45

Time : 2 hours

The figures in the margin indicate full marks for the questions.

1. Multiple choice questions :
(***All*** are ***compulsory***) 1×5=5

A. How would you express the process of Neuro-Muscular Junction?

(a) The process involves the generation of nerve impulse, its propagation, synaptic transmission, and neuro-transmitters, which results in muscle stimulation and contraction.

(b) The process involves the generation of muscle impulse, its propagation, neuro-transmission, and neurotransmitters, which results in nerve stimulation and contraction.

(c) The process involves the generation of nerve impulse, its propagation, neuro-transmission, and hormones, which results in muscle stimulation and relaxation.

(d) The process involves the generation of muscle impulse, its propagation, synaptic transmission, and neurotransmitters, which results in nerve stimulation and relaxation.

B. Which of the following is true about the mechanism of muscle stimulation and contraction ?

(a) Muscles contract upon receiving a signal from the nervous system

(b) Muscles never require nervous signals to contract

(c) Muscles contract only at the neuro-muscular junction

(d) Muscles can contract without the presence of nerve endings

C. Which of the following is true about Atrial Flutter ?

(a) The atria beat at a rate of 60-100 beats per minute.

(b) The ECG shows irregular fibrillatory waves.

(c) The atrial rate is between 250-350 beats per minute.

(d) It primarily originates from the left atrium.

D. Which phase of the cardiac cycle is characterized by ventricular contraction and the closure of the atrio-ventricular (AV) valves ?

(a) Atrial systole

(b) Isovolumetric contraction

(c) Ventricular ejection

(d) Isovolumetric relaxation

E. Which region of the nephron is primarily responsible for reabsorbing water and essential ions ?

(a) Glomerulus

(b) Proximal Convoluted Tubule

(c) Loop of Henle

(d) Collecting Duct

2. Short answer type questions : ***(any five)*** 2×5=10

A. How are neurogenic and myogenic hearts differ in terms of nerve impulse generation ?

B. Which ion is essential for thyroid hormone synthesis ? Write down the characteristic feature of Gravesi disease.

C. What are the effects of thyroid hormone imbalances, such as hypothyroidism and hyperthyroidism ?

D. Write down the function of Troponin-T, Troponin-C and Troponin-I.

E. Draw a neat and labelled diagram of SARCOMERE.

F. What is hormonal feedback mechanism ?

3. Long answer type questions : ***(any four)*** 5×4=20

A. What is a digestive enzyme ? Elaborate on different digestive enzymes and how they aid on digestion.

B. Write down the primary function of the adrenal medulla.

C. Describe the electrophysiological features and clinical significance of Atrial Flutter, including its typical ECG pattern and pathophysiology.

D. Describe the function of the parathyroid gland in calcium homeostasis.

E. What are the primary hormones secreted by the adrenal cortex and medulla, and how do they help the body respond to stress ?

4. Long essay type questions : ***(any one)*** 10×1=10

A. Explain the mechanical and chemical processes involved in the digestion and absorption of carbohydrates, proteins, fats, and nucleic acids.

B. Describe the structure and function of the respiratory system, emphasizing the processes of external and internal respiration.

C. Explain the structure and function of the pancreas, highlighting the roles of its exocrine and endocrine components. How do insulin and glucagon regulate blood glucose levels ?

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