# 1804N222

2/21 MSc Sem.-2 Examination Candidate's Seat No :_____

**LSC 408 Mammalian Physiology**

[Time: 2.30 Hrs] **[Max Marks: 70]**

**Instructions:** All questions are compulsory
Illustrate your answers with neat diagrams wherever necessary.

**Question 1** **Write the following**

(i) Describe the hierarchical organization of skeletal muscle from muscle fiber to whole muscle. (7 Marks)

(ii) Elaborate on the structural components of a neuron, including the cell body, axon, and synapses. (7 Marks)

**OR**

(i) What is role of muscular system? Explain its various types in detail. (7 Marks)

(ii) How do neurotransmitters transmit signals across synapses, and what is their role in neural communication? (7 Marks)

**Question 2** **Write the following**

(i) How are carbohydrates, proteins, and fats broken down and absorbed in the small intestine? (7 Marks)

(ii) Explore the functions of the pituitary gland and its role as the "master gland" in the endocrine system. (7 Marks)

**OR**

(i) Explain the processes of mechanical and chemical digestion in the stomach, focusing on the actions of gastric juices. (7 Marks)

(ii) Discuss laws involved in respiration process. (7 Marks)

**Question 3** **Write the following**

(i) Describe the pathway of blood flow through the heart and the pulmonary and systemic circulations. (7 Marks)

(ii) Explain the roles of helper T cells and cytotoxic T cells in cell-mediated immunity. (7 Marks)

**OR**

(i) Explore the anatomy of the heart, including its chambers, valves, and major blood vessels. (7 Marks)

(ii) Write a short note on cardiac cycle. (7 Marks)

P.T.O.

Question 4 Write the following

(i) Describe the anatomy of the nephron, including its various segments and their functions. (7 Marks)

(ii) Discuss the hormonal regulation of the menstrual cycle, including the roles of estrogen, progesterone, follicle-stimulating hormone (FSH), and luteinizing hormone (LH). (7 Marks)

OR

(i) Elaborate on the processes of filtration, reabsorption, and secretion in the nephron. (7 Marks)

(ii) Explain the process of spermatogenesis, including its regulation by hormones. (7 Marks)

Question 5 Attempt any seven out of twelve (14 Marks)

(i) What distinguishes cardiac muscle from skeletal and smooth muscle in terms of structure?

(ii) How do the nervous and endocrine systems work together to maintain homeostasis?

(iii) Explain the role of dendrites and axons in neuron communication.

(iv) Name the protective layers that surround and support the brain.

(v) Name the primary organs involved in the human respiratory system.

(vi) What is the role of salivary amylase in the digestive process?

(vii) What are the primary components of blood and their functions?

(viii) Where is the sinoatrial (SA) node located, and what is its function?

(ix) How does the immune system distinguish between self and non-self antigens?

(x) Name three major electrolytes regulated by the kidneys.

(xi) How does reabsorption occur in the nephron, and what substances are reabsorbed?

(xii) How does testosterone contribute to male reproductive function?