

MSc Sem.-2 Examination

408

Biochemistry

May-2025

Time : 2-30 Hours]

[Max. Marks : 70

Instructions: Illustrate your answers with neat diagrams wherever necessary.

Question 1 Write the following

- (i) Describe the composition of blood and explain the role of each formed (7 Marks) element in maintaining physiological homeostasis.
- (ii) Describe the process of erythropoiesis, including the stages of development (7 Marks) and the regulatory factors involved.

OR

- (i) Describe the structural and functional differences between the epicardium, (7 Marks) myocardium, and endocardium.
- (ii) Describe the process of vascular constriction and platelet plug formation in (7 Marks) hemostasis.

Question 2 Write the following

- (i) Describe the anatomy of the respiratory tract, including the structure and (7 Marks) function of the tracheobronchial tree.
- (ii) Describe the bicarbonate buffer system and how it maintains acid-base (7 Marks) balance.

OR

- (i) Describe the process of nerve impulse conduction and the significance of (7 Marks) membrane excitability.
- (ii) Describe the phases of the breathing cycle with associated changes in (7 Marks) pressure (alveolar, intrapleural, transpulmonary).

Question 3 Write the following

- (i) Discuss the functions of saliva in the oral cavity apart from digestion. (7 Marks)
- (ii) Explain the phases of gastric secretion and how they are regulated. (7 Marks)

OR

- (i) Describe the functions of intestinal juice and its role in final stages of (7 Marks) digestion.
- (ii) Explain the process of protein digestion, including enzymes involved at each (7 Marks) stage.

Question 4 Write the following

- (i) Describe the structure of a nephron and explain the role of each part in urine (7 Marks) formation.
- (ii) Compare and contrast hormonal regulation of the nephron by aldosterone (7 Marks) and ADH.

OR

- (i) Describe the juxtaglomerular apparatus and its function in regulating renal (7 Marks) blood flow and GFR.
- (ii) Explain how the kidneys regulate water balance under the influence of ADH. (7 Marks)

Question 5 Attempt any seven out of twelve

(14 Marks)

- (i) What is the significance of the plateau phase in cardiac muscle action potential?
 - (ii) What causes the first (S1) and second (S2) heart sounds?
 - (iii) What is the primary function of erythrocytes in the blood?
 - (iv) Name the two types of leukocytes based on the presence or absence of granules.
 - (v) What is the function of 2,3-DPG in red blood cells?
 - (vi) What is the oxygen dissociation curve? Why is it sigmoid?
 - (vii) Define chloride shift.
 - (viii) What is the pH of mixed saliva?
 - (ix) What is the function of bile salts in fat digestion?
 - (x) What is the function of the loop of Henle?
 - (xi) What is the function of the distal convoluted tubule (DCT)?
 - (xii) What is the role of renin in blood pressure regulation?
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