

Ex/SC/INSC/PG/CORE/TH/MI 104B/2025

MASTER OF SCIENCE EXAMINATION, 2025

(1st Year, 1st Semester)

INSTRUMENTATION

COURSE : SC/INSC/PG/CORE/TH/MI 104B

(Biomedical Science—I)

Time : 2 Hours

Full Marks : 40

Answer any **one** of the following questions.

[CO-1]

1. What is cell theory? What are nuclear pores? State their function. “Both lysosomes and vacuoles are endomembrane structures, yet they differ in terms of their functions” comment. How do you justify that microorganism has a greater metabolic activity than a macroorganism’?

2+1+1+3+3

2. How do you describe that the biological membrane has fluid mosaic structure? What is membrane fluidity? Describe the role of cholesterol in membrane fluidity. Why is cholesterol an important component of animal cell membranes?

4+2+2+2

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[Turn Over]

(2)

Answer any **one** of the following questions.

[CO-2]

1. What is zwitterionic state of an amino acid? Construct the titration curve of an acidic amino acid vs NaOH with proper notation. How can the binding of two amino acids into a peptide formation be described? Describe the properties of peptide bond. Which amino acid is not optically active?

1+3+2+3+1

2. Describe different types of commonly available secondary structures of protein. Discuss different types of interactions which hold a protein into its tertiary structure. Are proteins with the same number of each different amino acid that forms them necessarily identical proteins? Justify your answer.

5+3+2

Answer any **two** of the following questions.

[CO-3]

1. What are the basic differences between enzymatic and non-enzymatic reactions? Discuss the term apoenzyme, holoenzyme, coenzyme and prosthetic group. How do you classify the enzymes on the basis of reaction type. 2+4+4
2. Name and describe the model of an enzyme action which proposes that the shape of the active site can be markedly modified by the binding of a substrate. What is its difference from the other model of enzyme action? Discuss the effects of temperature on enzyme activity. 4+4+2

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(3)

3. What is significance of K_m ? What is feedback inhibition? How is the activity of allosteric enzymes modulated? 2+3+5

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