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MBC-001

M. SC. (BIOCHEMISTRY)

(MSCBCH)

Term-End Examination

June, 2026

MBC-001 : CONCEPTS OF BIOCHEMISTRY

Time : 3 Hours

Maximum Marks : 100

Note : (i) Answer any **five** questions.

(ii) All questions carry equal marks.

(iii) Draw figures and flowcharts
whenever required.

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1. (a) What is Henderson-Hasselbalch equation ? Explain and give its importance. Discuss the importance of water as a universal solvent. 4+6

- (b) Define monosaccharides and describe the D and L-configuration of optical isomers and pyranose and furanose forms of sugars. 2+4+4
2. (a) Discuss the structural organisation of elastin and write its *five* applications. 6+4
- (b) What are blood group antigens ? Explain the role of carbohydrates in determining the specific blood groups. 3+7
3. (a) Write short notes on any *two* of the following : 2×5=10
- (i) Phospholipids
 - (ii) Properties of lipids
 - (iii) Glycolipids
- (b) Give a detailed account on sphingolipids. 10
4. (a) Justify the role of lipids as signaling molecules, with suitable examples. 10

- (b) What is Zwitter ion ? Describe the characteristics of a titration curve plotted to determine the pI of glycine (5.97); where $pK_1 = 2.34$ and $pK_2 = 9.60$.

10

5. (a) Write the salient features of secondary structure of protein. Explain Ramachandran plot. 5+5
- (b) Classify the proteins based on their structure. Describe the detailed structure of collagen. 5+5
6. (a) Explain the electrophoresis technique used for determination of molecular weight of a protein. 10
- (b) Illustrate the secondary and tertiary structure of DNA. 5+5
7. (a) Draw and discuss the secondary structure of *t*-RNA. 10
- (b) Describe the 'dideoxy' method of DNA sequencing. 10

8. (a) Elaborate the antioxidant mechanism of action of vitamin-C with reference to its structure. 10
- (b) Discuss any *two* biologically important metalloporphyrins. 10

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