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MBC–001

M. SC. (BIOCHEMISTRY) (MSCBCH)

Term-End Examination

December, 2024

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 flow charts wherever required.

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| 1. (a) Explain the following : | 5+5=10 |
| (i) Chemical composition of a normal human | |
| (ii) van der Waals interactions in aqueous systems | |
| (b) Describe the structure and biological roles of proteoglycans. How do acid derivatives and amino sugars contribute to cellular functions ? | |
| | 5+5 |

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2. (a) Classify lipids on the basis of fatty acids and explain the properties of fatty acids. 10
- (b) What are the specialised functions of lipids in the biological system ? 10
3. (a) Outline the methods used for the elucidation of structure of proteins. Why is determining the primary structure critical for understanding protein function ? 10
- (b) How does protein denaturation and renaturation affect the protein structure ? 10
4. Explain the significance of protein folding and describe how misfolding can lead to neurodegenerative diseases. Provide examples of such diseases and their relationship to protein dynamics. 7+7+6
5. (a) Explain the tertiary structure of DNA and various factors which contribute to its stability. 10
- (b) Describe the following : 5+5
- (i) Sphingolipids
- (ii) Glycerophospholipids

6. (a) Describe the chemical synthesis of oligonucleotides using the phosphate and phosphite methods. 10
- (b) Explain the role of Vitamin A in vision cycle. 10
7. (a) Give a detailed account on any *three* protein isolation methods. 15
- (b) Draw the structure of lactose and maltose. 5
8. (a) Write a note on functional importance of bacterial cell wall polysaccharides. Explain their clinical relevance. 12
- (b) Write a note on the structure and functions of sterols. 8

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