

2023
B.A./B.Sc.
Second Semester
GENERIC ELECTIVE – 2
CHEMISTRY

Course Code: CHG 2.11

(Biochemistry, Bio-inorganic & Environmental Chemistry)

Total Mark: 70

Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Define carbohydrates. Give the classification of carbohydrates with example. 4
- (b) Write a note on the following: 2×2=4
 - (i) Epimers
 - (ii) Mutarotation
- (c) Fructose has no aldehyde group but acts as a reducing agent. Explain. 3
- (d) Draw the Haworth projection formula of starch. 3
2. (a) Discuss the open chain structure of D-glucose. 4
- (b) What do you understand by α - and β -glycosidic linkage? Explain with example. 4
- (c) What are epimers? Explain with example. 3
- (d) Draw the Haworth projection formula of maltose. 3

UNIT-II

3. (a) Amino acids act as a proton donors as well as a proton acceptors. Give reason. 3
- (b) Briefly discuss the Merrifield solid-phase synthesis of peptide with chemical reaction. 6
- (c) Define peptide linkage. Explain the quaternary structure of protein. 5

4. (a) Give the classification of α -amino acids. 4
 (b) Write a note on isoelectric point. 3
 (c) Explain with chemical reaction, the method for the synthesis of dipeptide. 3
 (d) Discuss the primary structure of peptide. 4

UNIT-III

5. (a) What are fats and oils? How do they differ from each other? 3
 (b) Define rancidity. What are the methods used to prevent rancidity? 3
 (c) What is iodine number? Calculate the Iodine number of glyceryl trioleate. (Mol. Wt.= 884) 4
 (d) What are phospholipids? Give the biological functions of phospholipids. 4
6. (a) Differentiate between simple lipids and compound lipids with example. 3
 (b) Write a short note on trans fat. 3
 (c) What are glycolipids? Discuss the biological importance of glycolipids. 4
 (d) Explain hydrogenation of oils with an example. What is the importance of hydrogenation? 4

UNIT-IV

7. (a) Write a note on the following: $2 \times 2 = 4$
 (i) Haemoglobin
 (ii) Myoglobin
 (b) Discuss the role of Ca^{+2} ion in the biological system. 4
 (c) What are trace elements? Mention four important trace elements. 3
 (d) Write a note on Na/K ion pump in the biological system. 3
8. (a) Write three heavy metals with their toxic effects. 3
 (b) What is nitrogen fixation? What is the importance of nitrogen fixation? 4
 (c) Write a note on the following: $2 \times 2 = 4$
 (i) Metalloporphyrins
 (ii) Metalloenzymes

- (d) Write three non-metals and the disease caused due to their deficiency. 3

UNIT-V

9. (a) What is acid rain? How are they caused? What are the effects of acid rain? 5
(b) How is water pollution cause through use of chemical fertilizers? Mention ways to control water pollution. 5
(c) Discuss in brief the pollution caused by Hg and Pd. 4
10. (a) What is greenhouse effect? What are the effects of global warming? 5
(b) What are the main sources of CO₂ pollution? Mention four ways to control CO₂ pollution. 5
(c) What are suspended particulate matters? Mention its effects. 4
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