

2024
B.A./B.Sc.
Second Semester
 GENERIC ELECTIVE – 2
CHEMISTRY
Course Code: CHG 2.11
 (Biochemistry, Bioinorganic & Environmental Chemistry)

Total Mark: 70

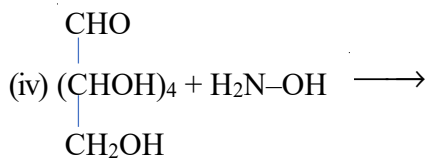
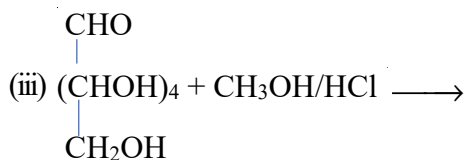
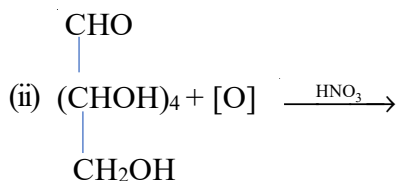
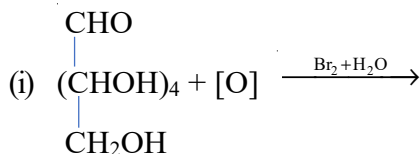
Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

UNIT-I

1. (a) What are monosaccharides? Give their classification. 4
 (b) Complete the following reactions: 1×4=4



- (c) Draw the Haworth structure of the following: 2×3=6
- (i) α -D-glucofuranose
 - (ii) β -D-glucofuranose
 - (iii) β -D-glucofuranose
2. (a) What are anomers? Draw the α -anomer and β -anomer of D-glucose. 3
- (b) Write a short note on the following: 2×2=4
- (i) Cellulose
 - (ii) Sucrose
- (c) Differentiate between reducing sugar and non-reducing sugar. 3
- (d) Draw the structure of α -furanose and β -furanose using Fischer's projection. 4

UNIT-II

3. (a) Write a note on zwitterions. 3
- (b) Give a brief account on the structure of secondary protein. 7
- (c) Discuss the Sheehan's method of synthesis of peptide. 4
4. (a) Write note on secondary structure of protein. 4
- (b) Differentiate between essential amino acids and non-essential amino acids. 3
- (c) Give the chemical reaction involve in Gabriel phthalamide synthesis of amino acid. 3
- (d) Briefly explain one method for the determination of peptide structure. 4

UNIT-III

5. (a) What are fatty acids? Give two examples. 2
- (b) Differentiate between animal fats and plant oil. 3
- (c) Define saponification and saponification value. What is the importance of saponification value? 4
- (d) Discuss the biological importance of triglycerides. 3
- (e) Define iodine number. 2

6. (a) Calculate the saponification value of triaurate having molecular weight 638. 3
- (b) Write a short note on omega fatty acid. 3
- (c) What are phospholipids? Discuss the biological importance of phospholipids. 4
- (d) What is the difference between saturated and unsaturated fats? How does their chemical structure affect their properties? 4

UNIT-IV

7. (a) Write a short note on the following: 2×2=4
- (i) Chlorophyll
- (ii) Biochemical effect of mercury
- (b) Discuss the role of cobalt in vitamin-B₁₂. 4
- (c) What do you mean by essential elements in biological systems? Give example. 2
- (d) Discuss the role of metals and non-metals in the metabolism. 4
8. (a) What are heme-proteins? Write a short note on myoglobin. 3
- (b) What are alkaline earth metal ions? Discuss its biological role with reference to Ca⁺². 5
- (c) Write a short note on the following: 3×2=6
- (i) Nitrogen fixation
- (ii) Metalloenzymes

UNIT-V

9. (a) What is ozone hole? Discuss the consequences of ozone depletion on human health and the environment. 5
- (b) Write the key parameters used to assess the quality of drinking water and discuss one method used for water treatment to ensure its safety for consumption. 5
- (c) What is a photochemical smog? Discuss its effects on human health. 4
10. (a) Explain the sources and effects of carbon monoxide pollution in the atmosphere. 4

- (b) What is global warming? Outline its impact and strategies for mitigating global warming. 5
 - (c) What are organic water pollutants? Explain the potential health and environment impacts of organic water pollutants. 5
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