

2022
M.Sc.
Fourth Semester
 CORE – 11
CHEMISTRY
Course Code: MCHC 4.11
 (Inorganic Chemistry – IV)

Total Mark: 70

Pass Mark: 28

Time: 3 hours

Answer five questions, taking one from each unit.

UNIT-I

1. (a) Mention some essential elements in biological system. 3
- (b) Explain the Na⁺ / K⁺ pump. 4
- (c) What are crown ether? Explain with examples. 4
- (d) What are the functions of biological membranes? 3

2. (a) What are light reactions? Write a short note on photosystem II. 2+3=5
- (b) Explain a brief structure of chlorophyll. 3
- (c) Write short notes on the following: 3×2=6
 - (i) Ionophores
 - (ii) Rubredoxin

UNIT-II

3. (a) Explain how iron is bonded to different types of ligands in heme proteins. 3
- (b) What is homotropic effect? Discuss in detail the cooperativity effect in haemoglobin. 1+6=7
- (c) Give a brief account on the synthetic oxygen carriers based on model systems. 4

4. (a) Discuss the structure of haemoglobin. 3
 (b) Explain the optical spectra of myoglobin with the help of diagram. 6
 (c) Discuss the mechanism involved in the addition of oxygen to substrate by cytochrome P-450 enzymes. 5

UNIT-III

5. (a) Discuss the importance of iron metallo enzyme with reference to its storage and transport. 4
 (b) Explain the biochemistry of cobalt in vitamin B₁₂. 4
 (c) Write short notes on the following: 3×2=6
 (i) Carbonic anhydrase
 (ii) Carboxy peptidase
6. (a) What are siderophores? 2
 (b) Write short notes on the following: 2×3=6
 (i) Ferritin
 (ii) Ceruloplasmin
 (iii) Xanthine oxidase
 (c) Briefly explain the interchangeability of zinc and cobalt in enzyme. 3
 (d) Write the importance of copper enzymes in the living system. 3

UNIT-IV

7. (a) What are the consequences of zinc deficiency? 4
 (b) How can Be (beryllium) poisoning be prevented? 4
 (c) Write short notes on: 3×2=6
 (i) Cisplatin
 (ii) Dicycloplatin
8. (a) What are the causes of Hg poisoning? 4
 (b) What are the signs and symptoms associated with severe cases of arsenic poisoning? 3
 (c) Discuss the symptoms of iodine deficiency. What are the best food sources of iodine? 4+3=7

UNIT-V

9. (a) Give the differences between fluorescence & phosphorescence. 4
(b) Write short notes on the following: $3 \times 2 = 6$
(i) Photochromism
(ii) Charge transfer states
(c) How many major structural types are observed for dinuclear metal clusters containing M-M multiple bonds? Explain one of the structural types. $1 + 3 = 4$
10. (a) Discuss the photochemical substitution & redox reactions of Cr (III) complexes. 4
(b) Write short notes on the following: $3 \times 2 = 6$
(i) Ligand field states
(ii) Thexi states
(c) Explain the one dimensional solids. 4
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