

Exam. Code : 210403

Subject Code : 4938

M.Sc. Chemistry 3<sup>rd</sup> Semester (Batch 2020-22)

**INORGANIC CHEMISTRY**

Paper : Course—XVI

Time Allowed—3 Hours] [Maximum Marks—50

**Note** :—Attempt **FIVE** questions in all, selecting at least **ONE** question from each section. The **fifth** question may be attempted from any section. All questions carry equal marks.

**SECTION—A**

1. (a) What do you understand by essential trace elements ? Give five examples. Also mention their biological roles. 6
- (b)  $\text{Na}^+ - \text{K}^+$  pump is electrogenic in nature. Explain. 4
2. (a) What do you understand by chelation therapy ? Suggest suitable remedy for copper poisoning. 4
- (b) Write short notes on :
  - (i) Toxic effects of antibiotics
  - (ii) Iron nutrition and toxicity. 6

**SECTION—B**

3. Illustrate the structure of myoglobin and hemoglobin. Describe in detail their role in biological systems. 10

4. (a) Briefly discuss the model complexes of iron, cobalt and copper. 6
- (b) Discuss the structure and functions of rubredoxins and ferredoxins. 4

**SECTION—C**

5. (a) DNA polymerase play important role in biological systems. Explain. 3
- (b) Write a short note on the role of creating kinase in biological systems. 3
- (c) What is ATP-cycle ? Also discuss its importance in biological systems. 4
6. What is nitrogen fixation ? Discuss in detail in-vivo and in-vitro nitrogen fixation. How is nitrogen fixation different from nitrogen assimilation ? 10

**SECTION—D**

7. (a) Vitamin  $\text{B}_{12}$  catalyze 1,2-shift reactions in various metabolic processes. Suggest suitable mechanism for these reactions. 5
- (b) What are superoxide dismutases (SODs) ? Also discuss various types of SODs and their biological role. 5
8. (a) Compare the role of zinc in carbonic anhydrase and carboxy peptidase A. 5
- (b) Discuss the biological importance of  $\text{Ca}^{2+}$  with special emphasis on calcium pump. 5