**Exam. Code : 210403**
**Subject Code : 3820**

**M.Sc. Chemistry 3rd Semester**
**INORGANIC CHEMISTRY—II**
**Paper : Course-XVI**

Time Allowed—3 Hours] [Maximum Marks—50

**SECTION—A**

**Note :—** All questions are compulsory. Each question carries **1** mark.

1. What is the role of iodine in the biological systems ?
2. What is fractional oxygenation in Mb ?
3. How do ferredoxins play their function as electron transporters ?
4. Name two oxygen carriers in which two metal ions are involved in the binding of one oxygen molecule.
5. What is the importance of ATP-cycle in biological systems ?
6. What do you understand by poisoning of enzymes ?
7. Name one example of phenolate siderophore. Also give its structure.
8. Write chemical equations involved in photosynthesis.
9. What are the advantages of chelation therapy ?
10. Define nitrogen assimilation.

## SECTION—B

**Note :—** Attempt any **EIGHT** questions. Each question carries **3** marks.

1. $Na^+$-$K^+$ pump is electrogenic in nature. Explain.
2. Draw and discuss Hb-$O_2$ binding curves at different (i) partial pressure of oxygen and (ii) pH. How are these curves different from Mb-$O_2$ curve ?
3. What happens when Fe-porphyrin complex without polypeptide chain comes in contact with oxygen ?
4. Write a short note on iron-sulphur proteins.
5. Name an enzyme which is the naturally occurring organometallic compound. Also discuss two biochemical reactions accelerated by it.
6. Write a short note on Cu-Zn superoxide dismutase and its role in detoxification of human body.
7. Write a short note on the role of creatin kinase in biological systems.
8. Name the proteins which can serve as iron depots for biological systems and offer iron when required for metabolic activities. Also suggest the suitable mechanism for their action.
9. Write a short note on cyanide poisoning.

10. Structure of the enzyme plays an important role for performing a particular function. Justify this statement by giving suitable example.

11. Antibiotics are important for the treatment of various diseases but they also pose toxic effects to the biological systems. Comment with suitable explanation.

12. Write a short note on Chelation therapy.

## SECTION—C

**Note :—** Attempt any **TWO** questions. Each question carries **8** marks.

1. (a) What do you understand by essential trace elements ? Name three essential trace elements. Also discuss their roles in biological systems. 4

   (b) Briefly discuss the mechanism of oxygen binding by hemoglobin. 4

2. (a) Draw the structure of chlorophyll. Also discuss its important role in photosynthesis. 4

   (b) Briefly describe the role of hemerythrin and hemocya-nine as oxygen carriers. 4

3. (a) What is nitrogen fixation ? Briefly describe in-vivo and in-vitro nitrogen fixation. 5

   (b) Write a short note on role of transferrin in sequestering the excess of iron in the body. 3

4. (a) Briefly discuss the role of calcium in biological systems. 4

(b) What abnormalities are caused in biological systems ? Due to the deficiency of following elements :

(i) Chromium (III)

(ii) Magnesium

(iii) Iron

(iv) Iodine. 4