Exam. Code : 210403
Subject Code : 4832

M.Sc. Chemistry 3rd Semester

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 form any section. Each question carries **10** marks.

SECTION—A

1. (a) Na^+-K^+ pump is electrogenic in nature. Explain. 3

   (b) Write brief note on iron nutrition and toxicity. 3

   (c) Antibiotics are important for the treatment of various diseases but they also pose toxic effects to biological systems. Comment with suitable explanation. 2

   (d) Transferrin plays important role in sequestering the excess of iron in the body. Justify with suitable rationalization. 2

2. (a) Give the role of following elements in the biological systems :

   (i) Chromium (III)

   (ii) Iodine

   (iii) Copper 3

(b) Write brief note on chelate therapy. 3

(c) What do you understand by siderophores ? Give two examples. Also discuss their mechanism of action in the iron transport. 4

SECTION—B

3. (a) Illustrate the structure of myoglobin and hemoglobin. Describe in detail the importance of their role systems. 6

(b) What do you understand by iron-sulfur proteins ? Give their classification. Also briefly discuss their role in biological systems. 4

4. (a) Briefly describe the role of hemerythrin and hemocyanine as oxygen carriers. 4

(b) What are cytochromes ? Also explain their main functions and mechanism of action. 3

(c) Give three iron containing proteins. Also give their functions. 3

SECTION—C

5. (a) Briefly describe the importance of :

(i) ATP-cycle and

(ii) DNA polymerase in biological systems. 6

(b) What is the difference between nitrogen fixation and nitrogen assimilation ? 4

6. (a) Draw and briefly discuss "Z-Scheme" for electron flow in Photosystem I and Photosystem II. 4

(b) What is nitrogen fixation ? Discuss in detail in-vivo and in-vitro nitrogen fixation. 6

SECTION—D

7. (a) Calcium is essential for living organisms, including humans. Explain. 4

(b) Name two zinc containing enzymes in the biological systems. Also metabolic role. 6

8. (a) Draw and discuss the structure of vitamin B_{12}. Describe the important role played by it in biological systems. 6

(b) Structure of the enzyme plays an important role for performing a particular function. Justify this statement by giving suitable example. 4