



Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
(Autonomous)
End Semester Examination: MAR/APR 2025
Faculty: Science and Technology

Program: B.Sc.

Semester: VI

SET: A

Program (Specific): B.Sc. General

Course Type: DSEC- V

Class: T.Y.B.Sc.

Max. Marks: 35

Name of the Course: Inorganic Chemistry -II

Course Code: 24-CH-604

Time: 2Hrs

Paper: IV

Instructions to the candidate:

- 1) There are 4 sections in the question paper. Write each section on separate page.
- 2) All questions are compulsory.
- 3) Figures to the right indicate full marks.
- 4) Draw a well labelled diagram wherever necessary.

Q1) Rewrite the sentence with correct option.

5 × 1 = 5 Marks

1. Two ferrocene rings are staggered in _____ state.

- (a) solid (b) liquid (c) gas (d) plasma

2. The catalyst used in Oxo process is _____.

- (a) Pt (b) Rh (c) Co (d) Pd

3. Superoxide dismutase enzyme contains the element of _____.

- (a) Mn (b) Fe (c) Co (d) Zn

4. $[\text{W}(\text{CO})_6]$ displays _____ mechanism of ligand substitution.

- (a) dissociative (b) associative (c) interchange (d) nucleophilic

5. Ionic liquids are composed of _____.

- (a) cations (b) anions (c) cations and anions (d) molecules

Q2) Answer the following: (ANY 4)

4 × 1 = 4 Marks

1. Write the IUPAC name of ferrocene.
2. Name the iron storage protein.
3. Define liquid crystals.
4. Give an example of a reaction involved in making of ferrocene.
5. Name the method of synthesis of inorganic solids involving aging process.
6. Draw the structure of 2Fe-2S protein.

Q3) Answer the following: (ANY 4)

4 × 2 = 8 Marks

- i. Explain any method of synthesis of metal carbonyls with an example.
- ii. Name any two factors affecting Lability of complexes.
- iii. State any two physical properties of ferrocene.
- iv. Name any two solid electrolytes.
- v. Give two examples of non-redox metalloenzymes.
- vi. What is trans effect? Give its application.

Q4) Answer the following: (ANY 4)

4 × 2 = 8 Marks

- a) Draw the catalytic cycle for Monsanto process.
- b) State whether $[\text{Fe}_3(\text{CO})_{12}]$ complex obeys 18 electron rule.
- c) Explain halogenation of ferrocene.
- d) Give function of myoglobin and haemoglobin.
- e) Explain any one method of synthesis of phosphonium ionic liquids.
- f) Explain reductive elimination with an example.

Q5) Answer the following: (ANY 2)

2 × 5 = 10 Marks

1. Discuss Mannich and Friedel Craft alkylation reactions of ferrocene
2. Discuss oxo process with help of diagram of catalytic cycle.
3. Explain bioinorganic chemistry of iron.
4. Explain substitution reactions in square planar complexes.
