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Total No. of Pages : 02

Total No. of Questions : 11

**M.Sc (Chemistry) (Sem.-3)**  
**INORGANIC CHEMISTRY-III**

Subject Code : CHL-501-18

M.Code : 76678

Date of Examination : 12-12-2022

Time : 3 Hrs.

Max. Marks : 70

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains EIGHT questions carrying FIVE marks each and students have to attempt any SIX questions.
3. SECTION-C will comprise of two compulsory questions with an internal choice in both these questions. Each question carries TEN marks.

**SECTION-A**

**1. Answer briefly:**

- a) What do you understand by Cooperative Effect? What is cooperative effect in haemoglobin?
- b) Define cross coupling reaction with example.
- c) What is point group of CH<sub>4</sub> and SF<sub>4</sub>?
- d) Explain Bohr effect and Co-operative effect.
- e) Write down the functions of metalloproteins.
- f) What do you understand by turnover frequency? How is it determined?
- g) Draw the Sn axis of rotation in propadiene and trihydroxybenzene molecule.
- h) Inorganic Polymers are classified into various categories based on connectivities. With the help of an example show what is Connectivities of 1 and Mixed Connectivities of 2 and 3?
- i) Define cytochrome P<sub>450</sub>.
- j) Applications of inorganic polymers over organic polymers.

## SECTION-B

2. Write down the synthesis and applications of chalcogenide glasses.
3. Write a short note on  $O_2$  binding properties of heme and non-heme proteins.
4. Give a comparison of inorganic polymers with organic polymers.
5. What is the role of homogeneous and heterogeneous catalysis in oxidative addition..
6. Define and explain Co-operative effect and Bohr effect.
7. What are the point groups of  $Fe(CO)_5$ ? Write all the symmetry elements and symmetry operations present in the molecules.
8. What are symmetry elements? How many symmetry elements are possible? Discuss with the help of an example in each case.
9. Write a brief note on metal carbonyls hydroformylation.

## SECTION-C

10. Write a short note on synthesis and applications of tri- and tetra-phosphonitrilic halides.

**OR**

How the transition metal catalyst is useful for Suzuki cross-coupling reactions? Discuss with example and mechanism.

11. Define asymmetric synthesis. How is it different from conventional synthesis? Discuss the asymmetric catalytic cycles using any two organometallic catalysts.

**OR**

How Inorganic polymers are different from organic polymers? Give synthesis, structure and uses of silicones and polyphosphazenes.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**