

**RAN-1903080202010001****M. Sc. (Sem.-II) Examination September - 2025****Chemistry : Inorganic Chemistry (Paper-I)****Time: 3 Hours]****[Total Marks: 70****સૂચના : / Instructions**

- (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book
- (2) Attempt all the four questions.
- (3) Figures to the right indicate full marks.

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Student's Signature

Q.1. Answer briefly any three of the following. [18]

- (a) Explain Curie and Curie-Weiss law with suitable example.
- (b) Calculate diamagnetic correction for acetate (CH_3COO^-) ion and pyridine ($\text{C}_5\text{H}_5\text{N}$).
- (c) Describe an experimental set up for determining the magnetic anisotropy for a single crystal.
- (d) Describe the Faraday method for determining magnetic susceptibility of solid substance.

Q.2. Answer briefly any three of the following. [18]

- (a) What are π -accepter ligands? Discuss in detail the nature of bonding involved in metal carbonyls.
- (b) Discuss preparation properties and structure of $\text{Fe}_2(\text{CO})_9$.
- (c) Write short note on structure of nitrosyl.
- (d) What is metal π -complexes? Give classification of nitrosyls with suitable example.

Q.3. Answer briefly any three of the following [18]

- (a) Define Inorganic condensation and Inorganic addition polymers and explain the formation giving suitable example of at least one in each class.
- (b) Define Polymerization? Give the classification of inorganic polymers in detail.
- (c) What are synthetic co-ordination polymers? Discuss two-dimensional polymers with suitable example.
- (d) Explain Polymeric Boron Nitride.

Q.4. Answer briefly any three of the following. [16]

- (a) Describe pH-metric method for the determination of the composition of metal complexes.
- (b) Briefly discuss Werner's theory of co-ordination compounds with one suitable example. Give examples of Homoleptic co-ordination compounds and Heteroleptic co-ordination compounds.
- (c) What are Co-ordination compounds? Discuss factors affecting the formation of complex ion.
- (d) What is Chelation? Discuss role of metal chelates in living system.