

**M.Sc.(Chem.) Semester - 2 (CBCS) Examination**  
**March/April– 2019 (New Course)**  
**Inorganic Chemistry (CORE)**

Time: 2:30 Hours

Marks: 70

**Instructions:**

1. All questions are compulsory.
  2. Figures to the right indicate marks.
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**Unit-1 (14 marks)**Answer ALL questions**Q.1 (a) Answer the following. 4 Marks**

- |     |                                                     |   |
|-----|-----------------------------------------------------|---|
| (1) | Write a short note on magnetic induction.           | 2 |
| (2) | Give the characteristic of paramagnetic substances. | 2 |

**Q.1 (b) Answer any two question out of three. 10 Marks**

- |     |                                                                                 |   |
|-----|---------------------------------------------------------------------------------|---|
| (1) | Explain the theory of spin magnetic moment and orbital magnetic moment.         | 5 |
| (2) | Derive the Russell-Saunders coupling and explain with the help of $p^2$ system. | 5 |
| (3) | Write a note on magnetic properties of Lanthanide series.                       | 5 |

**Unit-2 (14 marks)**Answer ALL questions**Q.2 (a) Answer the following. 4 Marks**

- |       |                                                                   |  |
|-------|-------------------------------------------------------------------|--|
| (1)   | Calculate the number of ligands “n” in following metal complexes. |  |
| (I)   | $[\text{Co}(\text{CO})_n]^+$                                      |  |
| (II)  | $[\text{Cu}(\eta^5\text{-CP})_n]$                                 |  |
| (III) | $[\text{Rh}(\text{CO})_n]^+$                                      |  |
| (IV)  | $[\text{Fe}(\text{CO})_n]$                                        |  |

**Q.2 (b) Answer any two question out of three. 10 Marks**

- |     |                                                                |   |
|-----|----------------------------------------------------------------|---|
| (1) | Discuss on ligands similar to carbonyl (CO).                   | 5 |
| (2) | Write a note on Wacker (Smidt) process.                        | 5 |
| (3) | Write a note on hydrogenation of alkene by Wilkinson Catalyst. | 5 |

**Unit-3 (14 marks)**Answer ALL questions**Q.3 (a) Answer the following. 4 Marks**

- |     |                                                                        |   |
|-----|------------------------------------------------------------------------|---|
| (1) | Write a short note on importance and deficiency of calcium and sodium. | 2 |
| (2) | Write a short note on BAL and DTPA.                                    | 2 |

**Q.3 (b) Answer any two question out of three. 10 Marks**

- |     |                                                                                         |   |
|-----|-----------------------------------------------------------------------------------------|---|
| (1) | Explain metalloenzymes with its functions and example.                                  | 5 |
| (2) | Explain role of Hemoglobin(Hb) and Myoglobin(Mb) in oxygen transport with its function. | 5 |
| (3) | Discuss in detail: Cytochrome                                                           | 5 |

**Unit-4 (14 marks)**  
Answer **ALL** questions

**Q.4 (a) Answer the following. 4 Marks**

- (1) Discuss the structure of phosphazenes.

**Q.4 (b) Answer any two question out of three. 10 Marks**

- |     |                                                   |   |
|-----|---------------------------------------------------|---|
| (1) | Explain the manufacturing of silicones.           | 5 |
| (2) | Discuss the properties of phosphazenes.           | 5 |
| (3) | What is zeolites? Give its types and application. | 5 |

**Unit-5 (14 marks)**  
Answer **ALL** questions

**Q.5 (a) Answer the following. 4 Marks**

- (1) Write a note on types and classification of nanomaterials.

**Q.5 (b) Answer any two question out of three. 10 Marks**

- |     |                                                                                                     |   |
|-----|-----------------------------------------------------------------------------------------------------|---|
| (1) | Discuss the properties of metal oxide nano materials.                                               | 5 |
| (2) | Write a detail note on following instruments for nanoparticle characterization.<br>(I) SEM (II) XRD | 5 |
| (3) | Discuss the cause of interest in nanomaterials.                                                     | 5 |

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