

# C.U.SHAH UNIVERSITY

## Winter Examination-2021

**Subject Name: Inorganic Chemistry-III**

**Subject Code: 4SC05ICH1**

**Branch: B.Sc. (Chemistry)**

**Semester: 5**

**Date: 16/12/2021**

**Time: 11:00 To 02:00**

**Marks: 70**

**Instructions:**

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

- Q-1 Attempt the following questions: (14)**
- a) What is center of symmetry? (1)
  - b) Define symmetry element. (1)
  - c) What is horizontal plane of symmetry? (1)
  - d) Define inorganic polymer. (1)
  - e) What is cross linking? (1)
  - f) Define high nuclearity carbonyl clusters. (1)
  - g) Give any example of tri nuclear carbonyl cluster. (1)
  - h) Give conjugate acid and conjugate base for H<sub>2</sub>O. (1)
  - i) Write Arrhenius acid base principle. (1)
  - j) What is protonic solvent? (1)
  - k) Is HF protonic solvent or not? (1)
  - l) Give full form of CFSE? (1)
  - m) What is bidentate ligand? (1)
  - n) Which one is low spin complex K<sub>4</sub>[Fe(CN)<sub>6</sub>] or K<sub>4</sub>[Fe(H<sub>2</sub>O)<sub>6</sub>] (1)

**Attempt any four questions from Q-2 to Q-8**

- Q-2 Attempt all questions (14)**
- a) Describe center of symmetry. (7)
  - b) Explain multiplication table for C<sub>3</sub>V. (7)
- Q-3 Attempt all questions (14)**
- a) Write short note on layer polymer of (BN)<sub>n</sub>. (7)
  - b) Describe silicon rubber. (7)
- Q-4 Attempt all questions (14)**
- a) Write Wade's rules for electron counting scheme. (7)  
Find metal cluster frame work or skeletal structure of following (7)
  - b) (i) Os<sub>5</sub>(CO)<sub>16</sub>, (ii) [Ru<sub>5</sub>N(CO)<sub>14</sub>]<sup>-</sup> and (iii) Fe<sub>4</sub>C(CO)<sub>12</sub><sup>2-</sup>



- Q-5                      Attempt all questions                      (14)**  
**a)** Describe Lowry-Bronsted concept and Lux-Flood concept.                      **(7)**  
**b)** Describe Lewis acid base concept.                      **(7)**
- Q-6                      Attempt all questions                      (14)**  
**a)** Show chemical property of Anhydrous SO<sub>2</sub> (Liquid SO<sub>2</sub>).                      **(7)**  
**b)** Give classification of solvents.                      **(7)**
- Q-7                      Attempt all questions                      (14)**  
**a)** Write about factors affecting splitting energy.                      **(10)**  
**b)** Calculate CFSE and magnetic moment of K<sub>3</sub>[Fe(H<sub>2</sub>O)<sub>6</sub>] and find oxidation number of Fe.                      **(4)**
- Q-8                      Attempt all questions                      (14)**  
**a)** Explain magnetic behavior of transition metal complexes.                      **(7)**  
**b)** Explain Splitting of d-orbital in tetrahedral complex.                      **(7)**

