

C.U.SHAH UNIVERSITY

Summer Examination-2022

Subject Name: Inorganic Chemistry-III**Subject Code: 4SC05ICH1****Semester: 5****Date: 22/04/2022****Branch: B.Sc. (Chemistry)****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.
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Q-1 Attempt the following questions: (14)

- What is symmetry element? (1)
- Define symmetry operation. (1)
- What is vertical plane of symmetry? (1)
- Give any example of inorganic polymer. (1)
- What is cross linking? (1)
- Define High nuclearity carbonyl clusters. (1)
- Give any example of mono nuclear carbonyl cluster. (1)
- Give conjugate acid and conjugate base for NH_3 . (1)
- What is acid according to Lux-flood concept? (1)
- What do you mean by amphiprotic solvent? (1)
- Is C_6H_6 aprotic solvent or not? (1)
- Give full form of CFT. (1)
- Which one is high spin complex $\text{Na}_4[\text{Co}(\text{CO})_6]$ or $\text{K}_4[\text{Co}(\text{NH}_3)_6]$? (1)
- What bi dentate ligand? (1)

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

Q-2 Attempt all questions (14)

- Describe vertical plane of symmetry with example. (7)
- Explain multiplication table for PCl_3 . (7)

Q-3 Attempt all questions (14)

- Write general properties of inorganic polymer. (7)
- Write short note on layer polymer of $(\text{BN})_n$. (7)

Q-4 Attempt all questions (14)

- Write Wade's rules for electron counting scheme. (5)
- Find metal cluster frame work or skeletal structure of following (9)
 - $\text{Fe}_4\text{C}(\text{CO})_{12}]^{2-}$
 - $[\text{H}_3\text{Ru}_4(\text{CO})_{12}]^-$
 - $\text{Rh}_6(\text{CO})_{16}$

Q-5 Attempt all questions (14)

- Describe acid-base as Lowry and Bronsted concept. (7)



- b) Describe hard and soft acid-base concept. (7)
- Q-6** **Attempt all questions** (14)
- a) Write advantages and limitation of liquid ammonia. (7)
- b) Explain characteristic properties of solvents. (8)
- Q-7** **Attempt all questions** (14)
- a) Explain Splitting of d-orbital in octahedral complex. (7)
- b) Calculate CFSE and magnetic moment of $[\text{Fe}(\text{CO})_6]^{2+}$ and find oxidation number of Fe. (7)
- Q-8** **Attempt all questions** (14)
- a) Write multiplication table for C_{2v} . (7)
- b) Explain Splitting of d-orbital in tetrahedral complex. (7)

