Enrollment No: _____ Exam Seat No: _____

C. U. SHAH UNIVERSITY

Winter Examination-2022

Subject Name: Inorganic Chemistry-IV

Subject Code: 4SC06ICH1 **Branch: B.Sc. (Chemistry)**

Semester: 6 **Date: 19/09/2022** **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) Find spin multiplicity m_s for p^3. **01**
b) Define "Multi Electron System" **01**
c) What is back bonding? **01**
d) Calculate microstate for p^4. **01**
e) How to represent "Spectral term"? **01**
f) Write Schrodinger equation for electron moving in 1 dimension. **01**
g) Is d^8 system in Oh shows Jahn Teller effect? **01**
h) What is Metal Ligand Charge Transfer transition? **01**
i) Who gave "Valance Bond Theory"? **01**
j) What do you mean Polynuclear metal carbonyl? **01**
k) What is metal carbonyl? **01**
l) Electronic configuration of boron in its excited state. **01**
m) Write spectral term for d^3. **01**
n) What is trans effect? **01**

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

Q-2 **Attempt all questions** **(14)**

a) Write Hund's rule for determination of ground state spectral term. **8**
b) Calculate Spectral term and decide ground state term for d^3. **6**

Q-3 **Attempt all questions** **(14)**

a) Explain Leporte selection rule and spin selection rule for electronic spectra. **6**
b) Explain B-H-B three center two electron bonds **8**

Q-4 **(14)**

Derive equation of electron in three-dimensional box.

Q-5		**Attempt all questions**	**(14)**
	a)	Discuss the structure of Ni $(CO)_4$.	**7**
	b)	Discuss the structure of $Co_2(CO)_8$.	**7**
Q-6		**Attempt all questions**	**(14)**
	a)	Write π-bonding theory for "Trans effect".	**7**
	b)	Explain Kurnakov test.	**7**
Q-7		**Attempt all questions**	**(14)**
	a)	Derive Schrodinger equation in polar coordinates for hydrogen atom.	**8**
	b)	Draw structure and explain bonding in B_5H_9 and B_5H_{11}.	**6**
Q-8		**Attempt all questions**	**(14)**
	a)	Explain molecular orbital diagram of $[Fe(CN)_6]^{4-}$	**7**
	b)	Discuss the molecular orbital diagram of $[Pt\ (Cl)_4]^{2-}$	**7**