

Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Inorganic Chemistry-I

Subject Code: 4SC05CHC1

Branch: B.Sc. (Chemistry)

Semester: 5

Date: 21/03/2018

Time: 10:30 To 01:30

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) Define: C_n (Symmetry axis) (1)
 - b) Define: Aprotic solvents (1)
 - c) Define: Inversion centre (i) (1)
 - d) Define: Soft acid (1)
 - e) Define: Basic solvent & give its examples (1)
 - f) Write the formula of magnetic momentum (μ). (1)
 - g) Define: Metal cluster (1)
 - h) Define: Crystal Field Stabilization Energy (C.F.S.E.) (1)
 - i) What are Inorganic polymers? Give its example. (1)
 - j) What is point group of H_2O ? (1)
 - k) Give the structure of $Fe_2(CO)_9$. (1)
 - l) Define: Lewis acid and base (1)
 - m) Define splitting energy. (1)
 - n) What is glass transition temperature (T_g)? (1)

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

- Q-2** **Attempt all questions** **(14)**
- a) Give the symmetry element and point group with figure of following molecules. (5)
 - a) H_3BO_3
 - b) CO_2
 - c) $XeOF_4$
 - d) 1-Bromonaphthalene
 - e) SF_4
 - b) Give the symmetry element and point group with structure of following molecules. (5)
 - a) Acridine
 - b) Pyrrole
 - c) Ammonia
 - d) Phosphorus oxychloride
 - e) Cyclobutane
 - c) Explain σ_v, σ_h and identity (E). (4)



- Q-3 Attempt all questions (14)**
- a) Explain levelling effect on the basis of solvent- system concept. (5)
 - b) Explain Lewis concept. (5)
 - c) Discuss resonance effect and electronegativity. (4)
- Q-4 Attempt all questions (14)**
- a) Explain precipitation reaction and acid-base reaction in liquid ammonia in detail. (5)
 - b) Discuss various types of reactions in liquid sulphur dioxide. (5)
 - c) Discuss various types of reactions in liquid hydrogen fluoride. (4)
- Q-5 Attempt all questions (14)**
- a) Write a short note on Low Nuclearity Carbonyl Cluster (L.N.C.C.). (5)
 - b) Explain trinuclear carbonyl clusters. (5)
 - c) Explain Wade's rule. (4)
- Q-6 Attempt all questions (14)**
- a) Discuss polymeric boron nitride. (5)
 - b) Give general properties of inorganic polymers. (5)
 - c) Explain glass transition temperature (T_g). (4)
- Q-7 Attempt all questions (14)**
- a) In $[\text{Mn}(\text{H}_2\text{O})_6]^{+3}$ splitting energy of d orbitals is 10400cm^{-1} . Find C.F.S.E. and magnetic momentum. $1\text{ K.J.mol}^{-1} = 83.7\text{ cm}^{-1}$. (5)
 - b) Explain splitting of d orbitals in octahedral field and C.F.S.E. . (5)
 - c) Explain high and low spin complex. (4)
- Q-8 Attempt all questions (14)**
- a) Splitting energy of d orbital in $[\text{NiCl}_4]^{2-}$ $\Delta t = 3780\text{cm}^{-1}$ find C.F.S.E. and magnetic momentum. (5)
 - b) Give the symmetry element and point group with figure of following molecules. (5)
 - a) PCl_5
 - b) Eclips ethane
 - c) CH_4
 - d) Cyclopropane
 - e) BF_3
 - C) Explain any two factors affecting the splitting energy. (4)

