Enrollment No: _____ **Exam Seat No:**_____

C.U.SHAH UNIVERSITY
Winter Examination-2015

Subject Name : Inorganic Chemistry-I

Subject Code : 4SC05CHC1 **Branch :** B.Sc. (Chemistry)

Semester : 5 **Date :**02/12/2015 **Time :**2:30 **To** 5:30 **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.

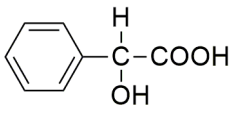
Q-1 **Attempt the following questions:** **(14)**

a) Define: Identity (E) (1)
b) Define: Inversion center (*i*) (1)
c) Define: Amphiprotic solvents (1)
d) Define: Soft bases (1)
e) Define: Acid solvents & give its example (1)
f) Define: Heat of fusion (1)
g) Define: Glass transition temperature (T_g) (1)
h) What is the value of C.F.S.E in Octahedral low spin complexes for fully filled electronic configuration? (1)
i) d-orbital in octahedral complexes is gerade or ungerade? (1)
j) Give the formula and unit for magnetic momentum. (1)
k) What is the point group of HCN? (1)
l) Define: Pairing energy (P) (1)
m) Calculate the high spin & low spin electrons in $[Cr(NH_3)_6]^{+2}$ octahedral complex. (1)
n) Give the structure of Re_3Cl_9. (1)

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

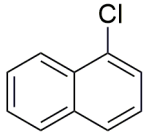
Q-2 **Attempt all questions** **(14)**

a) Give the symmetry elements and point group with figure of following molecules. **(5)**

a) 

b) NH_3

c) H_2O

d) 

e) $XeOF_4$

b) Give the symmetry elements and point group with structure of following molecules. **(5)**

a) Thiophene
b) Boric acid
d) 1,8-dichloro naphthalene
e) Staggered ferrocene

c) Acridine

c) What are the differences between σ_h, σ_v and σ_d. **(4)**

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

a) Discuss the effect of substituents on relative strengths of acids & bases. **(5)**

b) Define HSAB principle & give its applications. **(5)**

c) Explain concept of Lowry & Bronsted. **(4)**

Q-4 **Attempt all questions** **(14)**

a) Discuss precipitation reactions, complex formation reaction and redox reaction in detail. **(5)**

b) Explain various acid-base reactions in liquid ammonia. **(5)**

c) Give advantages & limitations of liquid ammonia as a solvent. **(4)**

Q-5 **Attempt all questions** **(14)**

a) Explain dinuclear cluster. **(5)**

b) Write a short note on low nuclearity carbonyl clusters. **(5)**

c) Explain zinti ions & cheveral phases. **(4)**

Q-6 **Attempt all questions** **(14)**

a) Discuss polymeric nitride polymer in detail. **(5)**

b) Explain various properties of silicones. **(5)**

c) Give the general properties of inorganic polymers. **(4)**

Q-7 **Attempt all questions** **(14)**

a) C.F.S.E value in $[Fe(CN)_6]^{-4}$ is = -26400 cm^{-1} and d orbital splitting energy is 33000 cm^{-1}. Find out the pairing energy. **(5)**

b) Discuss the factors affecting splitting energy. **(5)**

c) Explain the splitting of d-orbital in tetrahedral field. **(4)**

Q-8 **Attempt all questions** **(14)**

a) In $[Mn(H_2O)_6]^{+3}$ splitting energy of d orbitals is 10400 cm^{-1}. Find out C.F.S.E. and magnetic momentum. 1 k.J.$mole^{-1}$ =83.7 cm^{-1} **(5)**

b) Give the symmetry elements and point group with figure of following molecules. **(5)**

a) $PtCl_4^{-2}$

b) PCl_5

c) BrF_5

a) Eclips ethane

b) △

c) Explain high spin and low spin complexes. **(4)**