RNo 2 (08)

**Exam.Code:0039**
**Sub. Code: 0993**

**1129**
**B.Sc. (Hons.) Bio-Informatics**
**First Semester**
**BIN-1006: Chemistry – I**

**Time allowed: 3 Hours** **Max. Marks: 60**

***NOTE**: Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

*x-x-x*

I. Answer the following:-

a) Define ionization energy and effective nuclear charge.

b) Write the IUPAC name of the following compounds:

i) $K[CrF_4O]$ ii) $Fe(C_5H_5)_2$

c) Explain resonance effect and hyperconjugation.

d) Define ferromagnetism with suitable example.

e) What do you understand by activity coefficient?

f) Give two examples of acid-base reaction. (6x2)

**UNIT – I**

II. a) Give the trend of electronegativity along the period and down the group.

b) Depict the optical isomerism exhibited by $[Rh(en)_2Cl_2]^+$ and $[Cr(ox)_3]^{3-}$.

c) Taking suitable example, elaborate the $S_N^1$ reaction with energy diagram. (3x4)

III. a) Compare the ionization energies of the elements of carbon family and oxygen family.

b) Predict the geometry and the magnetic behaviour of $[CoFa]^{3-}$ on the basis of valence bond theory.

c) Explain carbenes with suitable examples. Also discuss its important method of generations. (3x4)

IV. a) Discuss the followings:

i) Basic postulates of Werner's coordination theory

ii) Mechanism and stereochemistry of $SN^2$ nucleophilic substitution reaction of alkyl halides.

b) Explain the molecular orbital diagram for $O_2^{2-}$ ion and predict the bond order. (8,4)

P.T.O.

## UNIT – II

V. a) Briefly describe the optical activity, dipole moment and polarization.

b) The boiling point of water is 100 °C. Calculate the boiling point of an aqueous solution containing 0.6 g of urea (molar mass = 60) in 100 g of water. ($K_b$ for water = 0.52K/m).

c) Discuss the various factors which influence the rates of reaction. (3,4,5)

VI. a) Give a brief account of the following:-

i) Diamagnetic and paramagnetic substances

ii) Activation energy and Arrhenius equation

b) Discuss in detail the osmotic pressure, its law and method of measurement. (6,6)

VII. a) Derive the relationship between the depression in freezing point and the molality of the solution.

b) Describe the role of solvents in alternating the strength of an acid or base.

c) Briefly explain the theories of chemical kinetics. (3x4)

*x-x-x*