First Year B. Sc. Examination
April / May – 2003

Special Chemistry
(Food Science & Quality Control)

Time : 3 Hours] [Total Marks : 70

Instructions : (1) This question paper carries five main questions.
(2) All questions are compulsory.
(3) Internal choice is given.
(4) Figures to the right indicates marks.

1. (a) Explain Joule - Thomson effect and its significance. 7
(b) Calculate the entropy change involved in the thermodynamic expansion of 1.2 moles of an ideal gas from 3.5 lit to 10.7 lit at 35° C. (R = 1.987 cal/deg.) 7

OR

1. (a) Explain the terms: Order of reaction, Molecularity. 7
(b) Explain Pseudo first order of reaction. 7

2. Any two:
(a) Explain Ostwald's dilution law and state its limitations. 7
(b) What is hydrolysis? Explain hydrolysis of Sodium acetate corelating Kh, Kw, and Kb. 7
(c) Calculate the pH of 1.25×10⁻⁴ NH₄Cl solution. 7
   Kw : 1×10⁻¹⁴, pKb = 4.65.
(d) What is ionic mobility? Explain inter-ionic attraction theory. 7
3 Any three :
(a) Give the names of elements of Lanthanide family with their atomic number. Explain Lanthanide contraction.
(b) Explain various oxidation states and magnetic properties of Lanthanides.
(c) On the basis of Sidgwick - Powell theory, explain the shape of Ammonia, Water and SF₆.
(d) Explain Crystal field theory for complexes.

4 Any four :
(a) Explain any one nucleophilic substitution reaction.
(b) Explain Chlorination of Benzene with mechanism.
(c) Explain the rules for R-S designations.
(d) Explain the terms: Chirality, Diastereomers Meso compounds.
(e) Explain: Rast method.
(f) Explain in C-Hexane the axial and equatorial bonds. Draw various forms of C-Hexane and state with reason, which form is the least stable.

5 Any three :
(a) What are Cleansing agents? Explain cleaning action.
(b) Explain Gabriel phthalimide method.
(c) Note on Iso electric point.
(d) Explain solubility and higher value of melting points of Amino acids.