

**NG-533**

Seat No. \_\_\_\_\_

**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 **7**  
thermodynamic expansion of 1.2 moles of an ideal gas  
from 3.5 lit to 10.7 lit at 35° C. ( $R = 1.987 \text{ cal / deg.}$ )

**OR**

- 1** (a) Explain the terms : Order of reaction, Molecularity. **7**  
Explain Pseudo first order of reaction.  
(b) State and explain the factors affecting rate 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  $K_h$ ,  $K_w$  and  $K_b$ .  
(c) Calculate the pH of  $1.25 \times 10^{-4}$   $\text{NH}_4\text{Cl}$  solution. **7**  
 $K_w : 1 \times 10^{-14}$ ,  $p^{k_b} = 4.65$ .  
(d) What is ionic mobility ? Explain inter-ionic attraction **7**  
theory.

- 3** Any **three** : **14**
- (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 SF<sub>6</sub>.
  - (d) Explain Crystal field theory for complexes.
- 4** Any **four** : **14**
- (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** : **14**
- (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.
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