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SB-3430

M. Sc. (Part - I) Examination

March / April – 2011

Chemistry : Paper - III

(Physical Chemistry)

Time : **3** Hours] [Total Marks :**52**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **M. SC. (PART - I)**

Name of the Subject :

☛ **CHEMISTRY : PAPER - III (PHYSICAL CHEMISTRY)**

☛ Subject Code No. : **3 4 3 0** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Attempt two sections in separate answer books.

(3) Figures to the **right** indicate full marks.

SECTION - I

1 (a) Write expressions for $\overline{M}_n$ and $\overline{M}_w$ polymers. Describe osmotic pressure method for mol. wt. determination. **4**

(b) Write two catalysts and mechanism for free radical polymerization. **3**

(c) Distinguish clearly between precision and accuracy with example. **2**

OR

1 (a) Describe dilute solution viscosity method for polymer mol. wt. determination. **4**

(b) Explain the terms : average mol. wt. in polymers, polydisperity index and chain polymerization. **3**

(c) Describe Q-test for the rejection of data. **2**

2 (a) Explain kinetics of reversible first order reaction. 4

(b) Describe photochemical reactions with example. 4

OR

2 (a) Explain enzyme catalyzed reactions. 4

(b) Derive an expression for the kinetics of the reaction between H_2 and Br_2. 4

3 (a) State and explain the second law of thermodynamics. 3

(b) What are nonideal binary liquid mixtures. Explain excess properties. 3

(c) Explain partial molar volume. How is it determined ? 3

OR

3 (a) Derive an expression for the Boltzmann distribution law. 3

(b) Derive Gibbs-Duhem equation. 3

(c) Discuss relationship between chemical equilibrium and partition function. 3

SECTION - II

4 (a) What is dissociation constant of an acid ? Describe a method to determine dissociation constant of monobasic acid. 4

(b) Explain the terms : Activity and Activity coefficient. 2

(c) Explain the relation between thermodynamic dissociation constant and dissociation function. 3

OR

4 (a) Explain the terms electrolytic polarization and concentration polarization. 4

(b) Explain Tafel theory of hydrogen overvoltage. 3

(c) Calculate ionic strength of 0.2 M $FeCl_3$. 2

5	(a)	Write a note on solid state detector.	**4**
	(b)	Give an account of force constant in molecular spectroscopy.	**4**

OR

5	(a)	Explain uses of tracers in nuclear chemistry.	**4**
	(b)	Explain the use of radiotracers in esterification or Friedel Craft reaction.	**4**
6	(a)	What are surfactants ? Explain their absorption and micelle formation.	**4**
	(b)	Explain the terms : Zeta potential and reverse micelles.	**2**
	(c)	Define the terms : emulsions, solubilization and microemulsions.	**3**

OR

6	(a)	Explain Gouy-Chapman electrical double layer.	**3**
	(b)	What is CMC ? Write one method for determination of CMC.	**3**
	(c)	State and explain : Krafft point, Cloud point, HLB.	**3**