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SB-3513

M. Sc. (Part - II) Examination

March / April – 2011

Physical Chemistry : Paper - III

Time : 3 Hours] [Total Marks :70

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 - II)

Name of the Subject :

☛ PHYSICAL CHEMISTRY : PAPER - III

☛ Subject Code No. : 3 5 1 3 ☛ Section No. (1, 2,.....) : 1&2

Seat No. :

Student's Signature

(2) Attempt all the six questions.

(3) Figures to the right indicate full marks.

SECTION – I

1 (a) Describe phase techniques in chain polymerization giving merits and demerits of each. 4

(b) Define and briefly explain chain transfer and living polymerization. 4

(c) Write the names of 5 famous polymer scientists and give their contribution. 4

OR

1 (a) Describe kinetics of catalyzed step polymerization. 4

(b) What are reactivity ratios ? Write their significance in block copolymer. 4

(c) Write synthesis and applications of terylene, nylon-6, 6 and polycarbonate. 4

2 (a) Explain different types of block copolymers. 4

(b) Give predictions in copolymers based on reactivity ratios. 3

(c) Describe the application of block copolymers. 4

OR

2 (a) State and explain the terms block and graft polymers. 3

(b) Obtain equation for kinetics of copolymerization. 4

(c) Explain Mayo-Lewis method for obtaining reactivity ratios. 4

3 (a) Name different thermal methods of analysis. Describe any one technique and its use in polymers. 4

(b) Name different methods for polymer mol wt. determination. Briefly describe osmometry method. 4

(c) Explain how intrinsic viscosity of a polymer can be determined. How is it related to molecular weight of polymers ? 4

OR

3 (a) Briefly describe how can a polymer be analyzed and characterized. 4

(b) Describe gel permeation chromatography technique. 4

(c) Describe light scattering method for polymer mol wt. determination. 4

SECTION – II

4 (a) Write a note on Solubility parameter. 4

(b) Describe thermodynamics of polymer dissolution. 4

(c) Give salient features of Flory Huggins theory of polymer solutions. 4

OR

4 (a) Explain the term viscoelasticity and Newtonian / Non-Newtonian fluids. 4

(b) Write a note on swelling and dissolution of polymers. 4

(c) Describe the effect of mol wt. and crystallinity on the dissolution of polymers. 4

5	(a)	Explain Glass transition temperature. How can it be determined ?	**4**
	(b)	What is meant by polymer crystallinity ? Describe a method to determine degree of crystallinity in polymer.	**4**
	(c)	What is theta solvent ? How can you determine intrinsic viscosity in theta condition ?	**4**

OR

5	(a)	Describe some important reactions of polymers.	**4**
	(b)	Write a note on polymer degradation.	**4**
	(c)	What is polymer crystallinity ? Discuss various factors affecting crystallinity in polymers.	**4**
6	(a)	Write short note on injection moulding.	**4**
	(b)	Name different polymer additives. Write note on antioxidants as polymer additive.	**4**
	(c)	Write a note on biomedical polymers.	**3**

OR

6	(a)	Write note on plasticizers, flame retardants and thermal stabilizers as polymer additive.	**3**
	(b)	Explain vulcanization and curing reactions.	**4**
	(c)	Describe extrusion method for polymer processing.	**4**