

Printed Pages : 4



NOE045

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 199435

Roll No.

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B.Tech

(SEM. IV) THEORY EXAMINATION 2014-15
POLYMER SCIENCE & TECHNOLOGY

Time : 3 Hours]

[Total Marks : 100

Note: Attempt all questions. Each question carries equal marks.

- 1 Attempt any **four** parts of the following: **4x5=20**
- (a) Give the structure, preparation and properties of:
 - (i) PS
 - (ii) PTFE
 - (b) Differentiate between:
 - (i) Thermoplastic and thermosetting polymers
 - (ii) Homo and co-polymers.
 - (c) Write brief explanatory notes on:
 - (i) Glass Transition Temperature
 - (ii) Inorganic polymers
 - (d) What is meant by the term crystallinity in polymers?
Discuss the effect of crystallinity on the properties of polymers.

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[Contd...

- (e) What are High performance polymers? Give the structure, properties and applications of any two high performance polymers.
- (f) Citing examples explain the terms:
- (i) Functionality of monomers
 - (ii) Syndiotactic polymer
- 2** Attempt any **two** parts of the following: **2x10=20**
- (a) Discuss the mechanism of cationic chain growth polymerization process. Derive kinetic equation for rate of polymerization during cationic chain growth polymerization.
- (b) Cite the different polymerization techniques? Discuss the emulsion polymerization technique of synthesizing polymers. In what way it is superior to other techniques?
- (c) What are the salient features of Step growth polymerization process? What polymers are formed on the reaction of the following:
- (i) Terephthaloyl chloride and 1,4- phenylene diamine
 - (ii) Phthalic anhydride and Glycerol
- Give their structures and applications.
- 3** Attempt any **four** parts of the following: **4x5=20**
- (a) Give the preparation and uses of Buna-S and Buna- N.
- (b) Differentiate between chain growth and step growth polymerization.

- (c) 42 gm of propene was polymerized by free radical polymerization process and DP^- was found to be 1000. Calculate the number of molecules of PP produced.
- (d) What are polymer composites? Discuss their applications.
- (e) Give the preparation and uses of UF resins.
- (f) Calculate the number average molecular weight of a given sample of poly(vinyl chloride) having 100 molecules of 5000 molecular weight, 150 molecules of 60000 molecular weight and 200 molecules of molecular weight 10000.

4 Attempt any **two** parts of the following: **2x10=20**

- (a) Explain the vulcanization of rubber. Discuss the preparation, properties and uses of:
 - (i) Dimethyl silicone elastomer
 - (ii) Butyl rubber
- (b) Describe the application of polymers in the field of medicine and automobiles.
- (c) Distinguish between:
 - (i) Stereoregular and stereoirregular polymers
 - (ii) Block and Graft copolymers
 - (iii) Fillers and plasticizers
 - (iv) LDPE and HDPE

- 5 Attempt any **four** parts of the following: **4x5=20**
- (a) Discuss the applications of polymers in building construction.
 - (b) Write brief note on Molecular weight distribution curves
 - (c) Discuss the application of polymers in sports
 - (d) Write and discuss the preparation and uses of phenol- formaldehyde resin.
 - (e) Give the mechanism of polymerization of polypropylene in the presence of transition metal halide and an organometallic compound.
 - (f) Write brief notes on:
 - (i) Bulk polymerization
 - (ii) Fiber reinforced plastics
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