Printed Pages: 4 EOE-045/NOE-045

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

Paper ID : 199411 Roll No. | | | | | | | | | | |

B.TECH.

Theory Examination (Semester-IV) 2015-16

POLYMER SCIENCE & TECHNOLOGY

Time : 3 Hours *Max. Marks : 100*

Section-A

Q.1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. (2×10=20)

(a) What do you understand by the term polymerization?

(b) Define functionality of a polymer.

(c) Draw stereo-regular forms of polypropylene.

(d) Write any two applications of polymer in Space science.

(e) Write the name and structure of the monomers of the following polymers.

(i) Nylon 6,6

(ii) Terylene

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(f) Find M_w for PE given its degree of polymerization as 10,000.

(g) Mention merits of various phase techniques used for polymerization.

(h) Weight - average molecular weight is higher than number-average molecular weight Explain.

(i) What are initiators in the free radical polymerization process? Give one specific example.

(j) Differentiate between Fibers and Elastomers.

Section-B

2. Attempt any five questions from this section. (10×5=50)

(a) Write brief notes on:

(i) High performance polymers

(ii) Additives for polymers.

(b) Discuss the applications of polymers in electronics, building construction and automobiles.

(c) Write the mechanism of polymerization of polypropylene using Ziegler - Natta catalyst.

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(d) Write general characteristics of polymers in comparison with common organic compounds?

(e) What are elastomers?Give the preparation and uses of GR-I and silicons?

(f) Differentiate between

(a) Addition and condensation polymerization.

(b) Chain growth and step growth polymerization.

(g) Write the method of preparation, properties and applications of polyvinyl chloride (PVC) and polyvinyl acetate (PVA).

(h) Differentiate between

(i) Thermo plastic and thermo setting plastic.

(ii) Homo polymer and co polymer.

Section-C

Note: Attempt any two questions from this section.

(15×2=30)

3. (a) If 10 g of Polyethylene is completely burnt in the presence of excess air, how many moles of CO_2 will be produced.

(b) Explain how the structure of a polymer affects its mechanical properties.

(c) Discuss crystallinity of polymers.

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4. (a) Explain the kinetics of condensation polymerization.

(b) Write the mechanism of anionic polymerization of PMMA.

(c) A Polymer sample consists of 10 molecules of molecular weight 5000,15 molecules of molecular weight 7,500,15 molecules of molecular weight 10,000, 20 molecule of molecular weight 15000, 30 molecule of molecular weight 20,000 and 10 molecules of molecular weight 25,000. Calculate the Number average and Weight average molecular weight of the polymer.

5. (a) What are composite polymers? How are they prepared? Discuss their applications.

(b) Explain emulsion polymerization.

(c) Write a note on polymerization techniques. Discuss the advantages and disadvantages of Bulk Polymerization.

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