Printed Pages: 02 **Sub Code: NOE045 / EOE045**

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B.TECH
(SEM IV) THEORY EXAMINATION 2017-18
POLYMER SCIENCE AND TECHNOLOGY

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Define the term monomer and degree of polymerization.
b. In what way 'co-polymerization' is different from 'homo-polymerization'.
c. Write down the names and structures of PTFE and PMMA.
d. 216 gm butadiene is co-polymerized with 104 gm of styrene.What is the molecular formula of the copolymer?
e. How chain flexibility affects the glass transition temperature of polymers.
f. Differentiate between addition and condensation polymers.
g. What are the typical additives used in polymer products?
h. What do you understand by (i) Isotactic chain (ii) Syndiotactic chain
i. What is nitrile rubber. Give the structure of GR-N rubber?
j. What is thermoplastic elastomer? Name some such elastomers.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Define the following:
   (i) Toughness
   (ii) Tensile strength
   (iii)Polymer fracture
   (iv) Elongation
b. What are the characteristics of polymers? Why do polymers have an average mol. wt.? Define terms weight average mol. weight and no. average mol. weight .Give their mathematical equation also.
c. Discuss the mechanism of anionicpolymerization. Why this process is also called "LIVING POLYMERISATION"Explain.
d. Discuss the free radical chain growth polymerization kinetics.
e. Write and discuss applications of polymers in space and medical science.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10

(a) What are composites polymers?Give the example and applications of various composites polymers.
(b) How the analysis and testing of polymer can be done by spectroscopic and thermal method.

4. Attempt any *one* part of the following: 10 x 1 = 10

(a) Write a brief note on :
  (i) High performance polymers.
  (ii) Crystallinity in polymers.

(b) Describe the preparation ,properties and uses of :
(i)PAN
(ii)PET
(iii)POLYURETHANE

5. Attempt any *one* part of the following: 10 x 1 = 10

(a) What is Zeiglar Natta catalyst?Write the mechanism of co-ordination polymerization.What are the advantages of this process over free radical polymerization?Write the structure of stereoregular polypropylene.

(b) What are silicones? Explain the preparation, properties and application of various silicones.

6. Attempt any *one* part of the following: 10 x 1 = 10

(a) How different type of moulding technique can be used for fabricating of plastics products.

(b) Differentiate between
(i)Thermoplastics and Thermosetting polymers
(ii)Chain growth polymerization and step growth polymerization.

7. Attempt any *one* part of the following: 10 x 1 = 10

(a) Discuss the various applications of polymers in the field of electronics and sports.

(b) Write down the preparations, properties and application of PVC and PVA.