Printed Pages: 02 **Sub Code: ROE 045**

Paper Id: | 1 | 9 | 9 | 4 | 3 | 0 | **Roll No.** | | | | | | | | | | |

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

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. **2 x 7 = 14**

a. How Neoprene and Teflon prepared? Mention its properties?
b. Define polydispersity index.
c. Weight average molecular weight is higher than number average molecular weight of a polymer. Explain?
d. Write any two applications of polymer in building constructions.
e. Write any four applications of polymer in agriculture.
f. What are the conditions for a substance to act as monomer? Give example of two monomers.
g. What is glass transition temperature?

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a. What do understand by condensation polymerization? Describe the preparation, properties and application of Bakelite.
b. Discuss the mechanism of Zeigler-Natta polymerization. Write the structure of stereo-regular polypropylene.
c. Differentiate between
(i) Thermoplastic and thermosetting plastic
(ii) Addition and condensation polymerization
d. Explain the kinetics of carbonic polymerization. Also write its important features.
e. Name the various thermoplastic. Write preparation, properties and applications of any one of them.

SECTION C

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

(a) Discuss the mechanism of anionic polymerization. Why this process is called living polymerization? Explain.
(b) Explain the kinetics of free radical chain polymerization. Also write its important features.

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

(a) Explain the costing and thermoforming for polymer processing.
(b) Discuss the application of polymers in aerospace, medical and sport field.

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

(a) Define the functionality and crystallinity of the polymer. If three polymers of molecular weight 20,000, 30,000 and 50,000 are mixed together in equal parts by weight. Calculate Mn, Mw and PDI.

(b) What is natural rubber? Write its limitation. Discuss the vulcanization of rubber.

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

(a) Write a note on plastic and fibre.

(b) Write short note on silicone polymer and High Speed Membrane Osmometer (HSMO).

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

(a) Explain the toughness, tensile strength and polymer fracture.

(b) What is polymer degradation? Explain different types of degradation?