TED (15) 3092
(Revision -2015)

Reg. No.....
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2019

POLYMER SCIENCE

[Maximum Marks: 100] [Time: 3 Hours]

PART-A

[Maximum Marks: 10]

(Answer ***all*** questions in one or two sentences. Each question carries 2 marks)

I. 1. Define degree of crystallinity.

2. Define the term Tf.

3. Define Mn.

4. Define tacticty of polymers.

5. List any two types of polymer blends. (5x 2 = 10)

PART-B

[Maximum Marks: 30]

(Answer any ***Five*** of the following questions. Each question carries 6 marks)

II. 1. Distinguish between amorphous and crystalline polymers with examples.

2. Derive the expression for Mw.

3. Distinguish between the molecular weight of polymers and simple molecules.

4. Explain geometrical isomerisms with schematic representation.

5. Explain optical isomerism with schematic representations.

6. Explain hydrolysis, acidolysis and aminolysis.

7. Explain the method of determining Tg by dilatometry. (5x 6 = 30)

PART-C

[Maximum Marks: 60]

(Answer ***one*** full question from each Unit. Each question carries 15 marks)

UNIT -I

III. (1). Explain the physical method to analyse polymers by DSC (8)

(2). Explain the detailed scheme for identification of nitrogen containing polymers (7)

OR

IV. (1). Explain the physical methods to analyse polymers by TGA. (8)

(2). Explain the different factors affecting Tg of polymers. (7)

UNIT -II

V. (1). Explain the techniques ebulliometry and osmometry. (8)

(2). In a particular sample of polymer 100 molecules have molecular weight 10^3 each, 200 Molecules have molecular weight 10^4 each and 200 molecules have molecular Weight 10^5 each. Calculate the number average and weight average molecular weight. (7)

OR

VI. (1). Explain the techniques of cryoscopy and end group analysis. (8)

(2). Derive the expression of Mn and Mv. (7)

UNIT -III

VII. (1). Explain isotactic syndiotactic and atactic with respect to polypropylene. (8)

(2). Explain different combinations of Z-N catalyst. (7)

OR

VIII. (1). Explain the importance of Z-N catalyst in stereo regularity of polymers. (8)

(2). Explain the microstructure-cis, trans and vinyl of BR, IR and CR. (7)

UNIT -IV

IX. (1). Explain the effect of hydroxyl, carboxylic and aldehyde groups in a polymer (8)

(2). Explain the chemical modifications cross linking and IPN. (7)

OR

X. (1). Distinguish between polymer blends and polymer alloys. (8)

(2). Explain copolymerization and grafting. (7)