

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII EXAMINATION – WINTER 2015

Subject Code: 172304

Date:16/12/2015

Subject Name: Manufacturing of Thermoplastics Materials

Time: 10:30am to 1:00pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) What are the sources for the monomer of polypropylene? **07**
Describe a commercial process for the manufacture of isotactic PP with a suitable flow diagram.

(b) How is vinyl chloride polymerized? Describe with a neat **07**
sketch of the flow diagram, the suspension process of manufacturing PVC.

Q.2 (a) How is HDPE prepared industrially? Explain Ziegler process **07**
in detail.

(b) Discuss, how are the properties of polyacrylates related to **07**
their structures. Also mention the important application of PMMA.

OR

(b) What are the different forms of Polypropylene? Discuss the **07**
type of catalyst employed for the manufacture of polypropylene and properties of the three forms of the polymer.

Q.3 (a) What is polyethylene? Mention the different sources from **07**
which its monomer is obtained; differentiate between the several types of polyethylene manufactured industrially.

(b) (a) Write briefly on how the different processes for **07**
manufacturing polyethylene developed.

(b) Compare the properties for LDPE and HDPE.

OR

Q.3 (a) With a neat sketch of flow diagram, describe the emulsion **07**
process of manufacturing PVC. What are the main advantages and disadvantages of the process?

- (b) Compare the structure of PVC with that of PE and explain how the structure is related to its properties. What are the important fields of application of PVC? **07**
- Q.4** (a) How is polystyrene manufactured industrially by the mass polymerisation (Tower process)? Explain. **07**
- (b) What are the different grades of PS generally marketed? Discuss the properties of PS and its structure. **07**
- OR**
- Q.4** (a) Describe manufacturing of polystyrene by suspension polymerisation with a suitable flow diagram. List various disadvantages of the process. **07**
- Q.4** (b) Give properties and application of PVF and PVDF. **07**
- Q.5** (a) Describe briefly the process of manufacturing PTFE. What are the special properties of PTFE compared to those of the other polymers? **07**
- (b) Write Short note a) Acrylonitrile butadiene styrene (ABS) and b) Styrene Acrylonitrile (SAN) **07**
- OR**
- Q.5** (a) Give the chemical reaction by which styrene monomer can be prepared. **07**
- (b) Name some fluorine containing polymers and give their molecular structures. What are the specific characteristics related to their molecular structures? **07**