

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V EXAMINATION – SUMMER 2015

Subject Code: 152303

Date: 11/05/2015

Subject Name: Plastics Recycling and Waste Treatment

Time: 2.30PM-5.00PM

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) Explain the (a) Primary Recycling and (b) Secondary Recycling as part of Reprocessing of Thermoplastics **07**
(b) Write short notes on (a) Recyclate and its Black color. (b) Effect of Heat in Recycling of Plastics **07**

- Q.2** (a) Write short notes on (a) Inter relationship affecting recycling activity. (b) The Formulation of Plastics **07**
(b) Give a list of Commonly used (a) Thermoplastics and (b) Thermo set materials, their application and Life Time Range **07**

OR

- (b) Write short notes on (a) Physical and Chemical changes in Recycling of Plastics. (b) Tensile and Impact Testing of “Recycled Expanded Polystyrene”. **07**
Q.3 (a) Explain the Rheology of Plastics in detail. With the help of a clean line diagram, show the basic parts of MFI Machine and describe its working. **07**
(b) By performing simple experiments, explain that how can you assess the effect of processing on properties of plastics. Explain the methods (a) Closed loop recycling with regrind only. (b) Blending with virgin method. (c) Cascading 100% regrind. **07**

OR

- Q.3** (a) Write a short note on (a) Chemical Recycling and (b) Biopolymers **07**
(b) Considering the methods of evaluation, explain the Tensile- Impact Testing of waste plastics **07**

- Q.4** (a) With the help of a table of Miscibility Guide for the various polymers, explain in detail about the need of sorting of plastics **07**
(b) Write short notes on (a) Hydrogenation (b) Gasification and (c) Energy Recovery. **07**

OR

- Q.4** (a) Give an average breakdown of the composition of plastics components in a common household refuse collection. Draw the Society of Plastics Industry (SPI) packaging codes. Discuss with the help of a line diagram about the process stream for recycled plastics material **07**
(b) Discuss, how can you perform the identification and sorting of plastics by Density method (Float and Sink Separation Method) **07**

- Q.5** (a) Write short notes on Stabilizers for (a) Thermal stabilization and (b) Light **07**

Stabilization

- (b) What is Thermal Processing? What is its use? Give the various categories usually distinguished by their air requirements. Discuss Pyrolysis in detail. **07**

OR

- Q.5** (a) Write short notes on (a) Contaminants (2) Agglomeration **07**
(b) Define the terms-Virgin grade, Recycle, Reclaim, Reuse, Mechanical Recycling, Feed stock Recycling, Energy Recovery **07**
