

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2152303****Date: 31/05/2019****Subject Name: Plastics Recycling & Waste Treatment****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

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

| | | MARKS |
|------------|---|-----------|
| Q.1 | (a) Define: Primary recycling, Secondary recycling and Tertiary recycling. | 03 |
| | (b) Explain density separation (Float/sink) with flow diagram. | 04 |
| | (c) Discuss secondary recycling by co-extrusion and co-injection molding for production of sandwich structure. | 07 |
| Q.2 | (a) Which are the sources of Plastics waste? Discuss. | 03 |
| | (b) List various size reduction techniques and explain any one. | 04 |
| | (c) Explain PET Glycolysis process with neat flow diagram. | 07 |
| | OR | |
| | (c) Discuss cryogenic grinding method for granulating difficult materials. | 07 |
| Q.3 | (a) Define: Pyrolysis. Give advantages of Pyrolysis. | 03 |
| | (b) Discuss various separation methods used for plastics waste. | 04 |
| | (c) Explain with suitable example, degradation mechanisms of thermoplastics due to repetitive processing. | 07 |
| | OR | |
| Q.3 | (a) Explain recycling of PU using hydrolysis process. | 03 |
| | (b) With neat flow diagram explain solvent separation process. | 04 |
| | (c) Write a note on: Plastics in Landfill. | 07 |
| Q.4 | (a) Which are the 3 R's of waste management? Discuss. | 03 |
| | (b) Draw flow diagrams for (i) Conversion of HDPE/PP woven sacks (ii) HDPE containers waste to molded Products. | 04 |
| | (c) Discuss In-line automatic recycling systems with neat diagram. | 07 |
| | OR | |
| Q.4 | (a) What are biodegradable plastics? How they are helpful in plastic waste management. | 03 |
| | (b) Discuss various problems associated with the incineration of plastics. | 04 |
| | (c) Write a note on: Medical plastics waste management. | 07 |
| Q.5 | (a) Discuss the use of plastics waste as fillers. | 03 |
| | (b) Explain about Rotory kiln and Fluidized bed Pyrolysis Reactor with schematic diagram. | 04 |
| | (c) Give plastics identification codes for recycling with their properties and applications. | 07 |
| | OR | |
| Q.5 | (a) How Plastic waste is used in Road construction? Discuss. | 03 |
| | (b) Discuss various technical approaches to secondary recycling. | 04 |
| | (c) With neat diagram explain various types of granulators and knives used for recycling. | 07 |
