

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-IV EXAMINATION – SUMMER 2025

Subject Code:3142311

Date:19-05-2025

Subject Name: Plastics Testing-1

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) State the full forms of ASTM, ISO and BIS.	03
(b) Define: specification and standards. Give basic reason of testing.	04
(c) Explain test method to determine water absorption of plastics. List any two applications of plastics where water absorption test is required.	07
Q.2 (a) Give ASTM standards of following testes: 1) Compression 2) Flexural 3) Izod Impact.	03
(b) Are following plastic sink/float when immersed in water? (a) PP (b) Nylon (c) PS (d) PC.	04
(c) Draw tensile test specimen as per ASTM standard. Explain Tensile test procedure along with factors affecting test results.	07
OR	
(c) List the types of Impact tests carried out on Plastic materials. Explain falling dart Impact test for Plastic film.	07
Q.3 (a) Define: Flexural strength, Impact strength, Hardness	03
(b) Explain test procedure to determine Shear Strength of Plastic sample.	04
(c) Draw and explain a typical Stress-Strain curve.	07
OR	
Q.3 (a) MFI test of PP is carried out at temperature 190°C and 2.16 kg load. The average extruded weight of the sample is 0.180 g. Test is carried out at time interval of 60 seconds. Calculate MFI value of a given material.	03
(b) Explain test procedure to determine bulk density.	04
(c) Explain three-point bending flexural strength test procedure with neat diagram along with factors affecting test results.	07
Q.4 (a) Explain spiral flow test with diagram.	03
(b) Draw the test specimen as per ASTM for following- Compressive, Flexural, Izod impact and trouser tear test.	04
(c) Define Melt flow index (MFI). Explain MFI test procedure with neat diagram.	07
OR	
Q.4 (a) Define: Density, Elongation and Yield Point.	03
(b) Give type of flame and smoke generated during burning of (1) PP (2) PVC (3) Phenol formaldehyde (4) Nylon, for identification.	04

- (c) Explain Izod impact and Charpy impact test with neat diagram in brief. **07**
- Q.5** (a) Give basic reasons for conditioning specimens. What is the standard laboratory temperature and humidity? **03**
- (b) Explain test method to determine density of plastics using specific gravity balance. **04**
- (c) Explain test procedure to determine Trouser Tear Strength of plastic film sample. **07**
- OR**
- Q.5** (a) Explain (i) copper wire test and (ii) drop test for identification of Plastics. **03**
- (b) Explain Durometer hardness (Shore D hardness) test for Plastics. **04**
- (c) Explain determination of Specific gravity of Polymer granules using a specific gravity bottle. Give specific gravity of (1) HDPE (2) PP. **07**
