

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – WINTER 2023****Subject Code:3142311****Date:24-01-2024****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) Give ASTM standards of following testes: 1) Tensile 2) Water absorption 3) MFI test. | 03 |
| (b) Identify the following plastics based on flame and kinds of smoke generated during burning (1) PE (2) PVC (3) Nylon (4) PS. | 04 |
| (c) Define Impact strength. Explain test procedure to determine Izod impact strength with neat diagram. | 07 |
| Q.2 (a) Give the behavior of following plastics when immersed in water- sink/float. (a) PP (b) HDPE (c) PVC. | 03 |
| (b) Explain water absorption test method for plastics. | 04 |
| (c) Define flexural strength. Explain 3-point bending flexural strength test procedure with neat diagram. | 07 |
| OR | |
| (c) Discuss determination of specific gravity of solid sample using specific gravity balance. | 07 |
| Q.3 (a) Explain spiral flow test with diagram. | 03 |
| (b) List and discuss processes used for specimen preparation from thermoplastic. | 04 |
| (c) Define compressive strength. Explain test procedure to determine compressive strength. | 07 |
| OR | |
| Q.3 (a) MFI test of HDPE is carried out at temperature 190°C and 2.16 kg load. The average extruded weight of the sample is 1.60 g. Test is carried out at time interval of 60 seconds. Calculate MFI value of a given material. | 03 |
| (b) Give basic reasons for conditioning specimens. Give standard laboratory temperature and humidity. | 04 |
| (c) Explain test procedure to determine Trouser Tear Strength of plastic film sample. | 07 |
| Q.4 (a) Give density of (1) LDPE (2) PVC (3) PS. | 03 |
| (b) Define: Stress, Strain, Modulus of elasticity, proportional limit | 04 |
| (c) List the methods to identify plastic materials and explain (i) drop sound test, (ii) flotation test, (iii) Visual examination, (iv) copper wire test. | 07 |
| OR | |
| Q.4 (a) State the full forms of ISO, ASTM and BIS. | 03 |
| (b) Define bulk density. Explain test procedure to determine bulk density. | 04 |
| (c) Define MFI. Explain Melt flow index test procedure as per ASTM standard with neat diagram. | 07 |

- Q.5 (a)** Draw the test specimen as per ASTM for Flexural, Impact and Compression test. **03**
- (b)** Explain falling dart Impact test for Plastic film. **04**
- (c)** Define Hardness. Explain Rockwell hardness test as per ASTM standard. **07**
- OR**
- Q.5 (a)** Give difference between Izod and Charpy Impact test. **03**
- (b)** Explain Shore D hardness (Durometer hardness) test for Plastics. **04**
- (c)** Draw and explain a typical Stress-Strain curve. **07**
