Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2016**

**Subject Code: 2162307** **Date: 09/05/2016**

**Subject Name: Testing and Identification of Plastics Materials**

**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.**

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|---|---|---|---|
| **Q.1** | **(a)** | (1) Define: (i) Testing (ii) Standards.<br>(2) A _____ material shows low modulus, low yield stress but very high elongation and high stress at break.<br>(i) soft & tough (ii) soft & weak (iii) hard & tough<br>(3) Define yield point and proportional limit.<br>(4) What is crack initiation energy?<br>(5) List the factors affecting the Impact strength of Plastics material.<br>(6) Give full form of (i) ASTM (ii) ISO<br>(7) Many polymers do not break under flexural load even after a large deflection for that type of material flexural stress given at _____ % strain. | **07** |
| | **(b)** | Explain: (i) Shear strength Test (ii) Abrasion Resistance Test | **07** |
| **Q.2** | **(a)** | Define HDT. Explain HDT test for plastics material in detail with neat sketch and factors affecting the test results. | **07** |
| | **(b)** | Define creep. Explain about creep properties of plastics material in detail. | **07** |
| | | **OR** | |
| | **(b)** | Explain about Thermal conductivity Test (ASTM C177) in detail. | **07** |
| **Q.3** | **(a)** | Explain about Differential Scanning Calorimetric (DSC) Test in detail. | **07** |
| | **(b)** | Explain about Thermo gravimetric Analysis (TGA) Test in detail. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain Co-efficient of Linear Thermal Expansion Test (ASTM D696) for plastics material in detail with neat sketch. | **07** |
| | **(b)** | Explain about Di-electric strength Test (ASTM D 149) in detail. List and explain factors affecting the test results. | **07** |
| **Q.4** | **(a)** | Define Refractive Index. Explain Refractive Index Test (ASTM D 542). | **07** |
| | **(b)** | Define Luminous Transmittance & Haze. Explain Test method carried out to determine Luminous Transmittance & Haze of plastics material with neat sketch. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain basic combustion process of Plastics material. | **07** |
| | **(b)** | Define flame retardant and self extinguish Plastics. Make a list of Inherently flame retardant, Less flame retardant and quite flammable plastics material. | **07** |
| **Q.5** | **(a)** | Explain ESCR test in detail with neat sketch. | **07** |
| | **(b)** | Explain Oxygen Index Test carried out for plastics material. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain about Rockwell Hardness test. | **07** |
| | **(b)** | Explain MFI test in detail with factors affecting the test results. | **07** |

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