

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III • EXAMINATION – SUMMER • 2014

Subject Code: 132101**Date: 04-06-2014****Subject Name: Elements of Material Science and Metallurgy****Time: 02.30 pm - 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.

- Q.1** (a) Define material science and Metallurgy and explain requirements of Engineering Materials **07**
 (b) Explain classification of Engineering materials with suitable examples. **07**
- Q.2** (a) Explain imperfections in crystals. **07**
 (b) Write classification of refractory and discuss the general requirements of a Refractory material with examples. **07**
- OR**
- (b) Explain the effects of heat treatment and alloying elements on properties of single phase material. **07**
- Q.3** (a) What is polymer? Explain polymerization mechanism with sketch. **07**
 (b) What is composite? Explain comparison between metal matrix and ceramic matrix composite. **07**
- OR**
- Q.3** (a) Differentiate between n-type and p-type semi conductors. **07**
 (b) Write a short note on Piezoelectric materials. **07**
- Q.4** (a) Explain various fields of metallurgical engineering. **07**
 (b) List the important Copper ores. Explain the principles of Copper production. **07**
- OR**
- Q.4** (a) What is powder metallurgy? Write advantage and limitations and applications of powder metallurgy. **07**
 (b) Explain any one casting method with sketch. **07**
- Q.5** (a) Explain principle used in soldering and brazing. **07**
 (b) What is the difference between destructive and non-destructive testing? Explain any one non-destructive test with sketch. **07**
- OR**
- Q.5** (a) Explain X-ray radiography with sketch. **07**
 (b) What is corrosion? Explain any one corrosion prevention method. **07**
