

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER 2013****Subject Code: 132101****Date: 07-12-2013****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 metallurgy. Describe Various fields of metallurgy. **07**
(b) What is corrosion? Differentiate in wet and dry corrosion. List different losses due to corrosion. **07**

- Q.2** (a) Give the classification of engineering materials. Explain the criteria for selection of materials for engineering applications. **07**
(b) What is imperfection? Discuss different crystals imperfections in brief. **07**

OR

- (b) Explain the effects of grain size, heat treatment and alloying elements on properties of single phase material. **07**

- Q.3** (a) Define and classify refractory. Discuss the general requirements of a refractory material with proper examples. **07**
(b) Classify testing methods. Explain X-ray Radiography testing method. **07**

OR

- Q.3** (a) What is ceramic? Describe the Structure and Properties of Ceramics. **07**
(b) Define Hardness. Explain Brinell Hardness method. **07**

- Q.4** (a) What is metallic coating? Explain the mechanism of corrosion protection by noble coating and active coating with suitable examples. **07**
(b) What are polymers? Discuss the Polymerization mechanisms. **07**

OR

- Q.4** (a) Define composite. Compare the metal matrix and ceramic matrix composites. **07**
(b) Write a note on Liquid crystal displays. **07**

- Q.5** (a) What is a Moulding? Draw and explain a flow chart showing major foundry activities. **07**
(b) What do you mean by powder metallurgy? Discuss advantages, limitations and applications of powder metallurgy. **07**

OR

- Q.5** (a) Define brazing. Explain basic steps of brazing. Give applications. **07**
(b) List the important Copper ores. Explain the principles of Copper production. **07**
