

GUJARAT TECHNOLOGICAL UNIVERSITY
B. E. - SEMESTER – III • EXAMINATION – WINTER 2012

Subject code: 132101**Date: 10-01-2013****Subject Name: Materials Science AND Metallurgy****Time: 10.30 am – 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.

- Q.1** (a) Give a brief Classification of engineering materials and explain Engineering requirements of materials. **07**
(b) Define and explain: (1) Creep (2) Toughness (3) Hardness. **07**
- Q.2** (a) Define composite. Discuss detailed classification of composite materials. Differentiate in polymer matrix and ceramic matrix composites. **07**
(b) Give the classification of polymers and discuss polymerization mechanism. **07**
- OR**
- (b) What is ceramic? Give a detailed classification of ceramics and write a note on covalent bond in ceramics. **07**
- Q.3** (a) Explain the effects of grain size and alloying elements on material properties with suitable examples. **07**
(b) Define Piezoelectricity and write a note on Piezoelectric materials. **07**
- OR**
- Q.3** (a) What do you mean by deformation? Differentiate in Elastic and Plastic Deformation. **07**
(b) Write a note on various fields of metallurgical engineering. **07**
- Q.4** (a) “Material Testing is an important task for industry.” Justify the statement and classify material testing methods. **07**
(b) Write the ores of aluminum and explain the principle of production of aluminum. **07**
- OR**
- Q.4** (a) What do you mean by non destructive testing? Explain any one NDT test method. **07**
(b) What is a foundry? List the advantages of casting process over other fabrication processes. Draw a flow chart showing major foundry activities. **07**
- Q.5** (a) Describe various advantages, limitations and applications of powder metallurgy. **07**
(b) Define corrosion. Give the types of corrosion. Briefly discuss different damages due to corrosion. **07**
- OR**
- Q.5** (a) Define soldering. Explain basic steps of soldering. Give applications. **07**
(b) Enlist different methods of corrosion prevention. Justify the role of design aspects in corrosion protection with suitable examples. **07**
