

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 132101****Date: 01-01-2015****Subject Name: Elements of Metallurgy and Material Science****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) Give a brief Classification of engineering materials and explain Engineering requirements of materials **07**

- Q.2** (a) Explain the criteria for selection of materials for engineering applications **07**
(b) Discuss structure, properties relationship in metals, ceramics, and polymers also indicate the type of bonding in these materials. **07**

OR

- (b) What is imperfection? Discuss different crystals imperfections in brief **07**
Q.3 (a) Explain the effects of grain size, heat treatment and alloying elements on properties of single phase material **07**
(b) Define and explain: (1) Creep (2) Toughness (3) Hardness **07**

OR

- Q.3** (a) What do you mean by deformation? Differentiate in Elastic and Plastic Deformation **07**
(b) What do you mean by Non-destructive testing? Explain any one NDT test method **07**

- Q.4** (a) What are the different types of metallic materials? What is the difference between an alloy and a composite material? **07**
(b) What is powder metallurgy? Write advantage and limitations and applications of powder metallurgy **07**

OR

- Q.4** (a) What is corrosion? What are the different types of corrosion **07**
(b) Differentiate between cold working and hot working **07**
Q.5 (a) Explain any one casting method with sketch **07**
(b) What are the ceramic materials? Write short note on Traditional ceramic and Modern ceramic materials **07**

OR

- Q.5** (a) What are polymers? Discuss the Polymerization mechanisms **07**
(b) Differentiate between thermosetting and thermoplastic polymers **07**
