

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject Code: 2132101****Date: 18-12-2014****Subject Name: Elements of 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) 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) What is imperfection in solids? Discuss with neat schematics different crystals imperfections in brief **02+05**
- OR**
- (b) Discuss Structure, Properties relationship in Metals, Ceramics, and Polymers also indicate the type of Bonding in these Materials **04+03**
- Q.3** (a) Give difference between the Elastic & Plastic deformation of Metals. **07**
 (b) Explain the effects of Grain size, Heat treatment and Alloying Elements on Properties of Single phase material **07**
- OR**
- Q.3** (a) What do you mean by Extraction of Metals? Name the Ore of i) Iron ii) Copper & iii) Aluminium. **07**
 (b) Give classification of Metal manufacturing Processes & Explain Process of Metal Machining in brief. **07**
- Q.4** (a) What is composite materials? Give classifications of different composite materials **07**
 (b) What is powder metallurgy? Write advantage and limitations and applications of powder metallurgy **03+02+02**
- OR**
- Q.4** (a) What is corrosion? List down various techniques to prevent corrosion & Explain any one in brief. **03 + 04**
 (b) List Down various Metal Working Processes & Give between cold working and hot working. **07**
- Q.5** (a) Give difference between Welding-Soldering & Brazing Process. **07**
 (b) What are the ceramic materials? List down important properties of Ceramics with their relevant applications. **02+03+02**
- OR**
- Q.5** (a) What are polymers? Differentiate between thermosetting and thermoplastic polymers **07**
 (b) What is Foundry? Explain any one casting method with sketch. **07**
