

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

Subject Code: 2133403**Date: 30-12-2014****Subject Name: Engineering Materials 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) Explain Iron – Iron Carbide equilibrium diagram with suitable sketch **07**
(b) What are the micro constituents of iron? Discuss them briefly. **07**
- Q.2** (a) Draw and explain the TTT diagram for 0.8% carbon steel and describe its isothermal transformations **07**
(b) Define hardenability? What are the factors affecting hardenability and explain a suitable method to predict hardenability **07**
- OR**
- (b) Explain any two thermal methods of surface heat treatment with neat sketches **07**
- Q.3** (a) Using Al-Cu alloy system as example, explain the concept of precipitation heat treatment **07**
(b) Discuss the composition, properties, and typical applications of any two copper alloys **07**
- OR**
- Q.3** (a) Explain composition, properties and applications of austenitic stainless steels **07**
(b) Describe ferritic and martensitic stainless steels **07**
- Q.4** (a) What do you understand by polymerization? With help of suitable examples, compare and contrast the process of addition and condensation polymerization **07**
(b) Explain the properties and applications of any three thermoplastics **07**
- OR**
- Q.4** (a) Differentiate between thermoplastics and thermosetting plastics **07**
(b) Describe the application of composite materials in various fields **07**
- Q.5** (a) What does impact test signify? Explain impact Izod test with neat sketches **07**
(b) What is fatigue failure? How fatigue test is carried out? Explain. **07**
- OR**
- Q.5** (a) Discuss the characteristics of ductile fracture and brittle fracture **07**
(b) Explain the testing procedure of Vickers hardness testing **07**
