

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BE - SEMESTER-III (NEW) EXAMINATION – SUMMER 2015**

**Subject Code:2130507****Date: 09/06/2015****Subject Name: MATERIAL SCIENCE AND TECHNOLOGY****Time: 02.30pm-05.30pm****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) What is Atomic Packing Factor? Calculate same for the FCC crystal structure. **07**  
(b) Write a note on recent development in nano materials. **07**
- Q.2** (a) Explain Eutectic system with help of equilibrium diagram. **07**  
(b) Write note on Covalent structure & Ionic structure with example. **07**
- OR**
- (b) Write a note on different type of Silicates structures with figure. **07**
- Q.3** (a) Draw & explain TTT (Time Temp. & Transformation) diagram for eutectoid steel. **07**  
(b) Explain term 'Imperfections in Crystal'. How they are classified? **07**
- OR**
- Q.3** (a) Describe Full Annealing heat treatment in plain carbon steel. **07**  
(b) Explain edge dislocation with help of sketch. **07**
- Q.4** (a) What are ceramic materials? State advantages of ceramic materials. **07**  
(b) How glass is manufactured? **07**
- OR**
- Q.4** (a) Explain briefly high grade Refractories. **07**  
(b) Explain types of stainless steel briefly. **07**
- Q.5** (a) Draw following planes & directions in cubic crystal structures. **07**  
(1) (100) (2) (110) (3) (111) (4) [100] (5) [110] (6) [111] (7) (232)  
(b) Write a note on nature of organic polymer. **07**
- OR**
- Q.5** (a) Explain cooling curve of binary eutectic alloy. **07**  
(b) Write effects of alloying elements on steel. **07**

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