

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**PDDC - SEMESTER-III • EXAMINATION – WINTER 2013**

**Subject Code: X 31902****Date: 20-12-2013****Subject Name: Material Science & 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)** Classify the engineering materials. Explain technological properties of metals and alloys. **07**
- (b)** Explain in detail the criteria for selection of materials for engineering applications. **07**
- Q.2 (a)** Explain in brief about FCC, BCC, and HCP structures for metallic elements. **07**
- (b)** Explain microscopic examination of the material with its all steps. **07**
- OR**
- (b)** Differentiate between macro and micro examinations. Explain importance of microscopic examination in metallurgy. **07**
- Q.3 (a)** Draw completely labeled iron carbide diagram and state critical reactions of the same. **07**
- (b)** Explain eutectic, eutectoid, and peritectic reaction. **07**
- OR**
- Q.3 (a)** What is phase diagram? Explain lever rule. **07**
- (b)** Explain effect of alloying element in steel. **07**
- Q.4 (a)** What is Malleable cast iron? Enlist properties and application of it. **07**
- (b)** Explain copper and its alloys. **07**
- OR**
- Q.4 (a)** Explain important factors in heat-treatment of steel. **07**
- (b)** Explain Lead and its alloys. **07**
- Q.5 (a)** What is powder metallurgy? State the applications of powder metallurgy. **07**
- (b)** Write short note on "Factors governing corrosion". And Distinguish between dry corrosion and wet corrosion. **07**
- OR**
- Q.5 (a)** Explain Jominy End-Quench test. **07**
- (b)** What do you mean by Non-destructive test? And describe the various NDT methods, their features, and applications. **07**

\*\*\*\*\*