

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (Old) EXAMINATION – WINTER 2019****Subject Code: 131904****Date: 04/12/2019****Subject Name: Material Science And Metallurgy****Time: 02:30 PM TO 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 allotropy of Iron with diagram. **07**  
(b) Explain effect of alloying elements in steel. **07**
- Q.2** (a) What is non destructive testing? Differentiate it with destructive testing. **07**  
(b) Define material science. Classify engineering materials. **07**
- OR**
- (b) Define metallurgy. Compare it with material science. **07**
- Q.3** (a) Explain induction hardening with diagram. **07**  
(b) What is solid solution? Explain types of solid solution. **07**
- OR**
- Q.3** (a) Explain flame hardening with diagram. **07**  
(b) Explain micro and macro examination of metals. **07**
- Q.4** (a) Explain dye penetration testing with diagram. **07**  
(b) Define corrosion. Explain causes of corrosion. **07**
- OR**
- Q.4** (a) Explain magnetic particle testing with diagram. **07**  
(b) Explain types of corrosion and their prevention. **07**
- Q.5** (a) Explain properties and applications of steel. **07**  
(b) Define powder metallurgy. Explain its advantages. **07**
- OR**
- Q.5** (a) Explain properties and application of wrought iron. **07**  
(b) Explain various steps in powder metallurgy process. **07**

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