

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-III Examination-Dec.-2011

Subject code: 131904**Date: 24/12/2011****Subject Name: Material Science & Metallurgy****Time: 2.30 pm -5.00 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 1) Toughness 2) Hardness 3) Hardenability 4) Malleability 5) Creep 6) Elasticity 7) Ductility . **07**
(b) Discuss selection criteria for materials used in engineering applications. **07**
- Q.2** (a) Draw Iron-Carbon Diagram and explain eutectic reaction in it. **07**
(b) Explain the effects on steel by alloying elements Silicon, Sulphur, Magnesium and Phosphorous. **07**
- OR**
- (b) Explain properties and application of Wrought iron. **07**
- Q.3** (a) Explain the Spark Test and Magnetic test for metallic materials. **07**
(b) Write the procedure for Jominy end quench practical and discuss its conclusion. **07**
- OR**
- Q.3** (a) Explain the difference between Annealing and Normalizing. **07**
(b) What is phase diagram? Explain Lever rule. **07**
- Q.4** (a) Differentiate between white cast iron and grey cast iron. **07**
(b) Give composition and use of White metal and Monel metal. **07**
- OR**
- Q.4** (a) Enlist the products made from powder metallurgy. Explain all four steps of powder metallurgy. **07**
(b) Explain structure and properties of Malleable cast iron. **07**
- Q.5** (a) Which non-destructive test is used for finding defects on welded joints? Explain it. **07**
(b) Explain cathodic protection against corrosion. **07**
- OR**
- Q.5** (a) Explain principle and procedure of Ultrasonic test. **07**
(b) Explain metal and organic coatings. **07**
