

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-III Regular / Remedial Examination December 2010

Subject code: 132101

Subject Name: Material Science & Metallurgy

Date: 14 /12 /2010

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) Draw and explain Iron-carbon equilibrium diagram. **07**
(b) Discuss all criteria for selection of materials for engineering applications. **07**

- Q.2** (a) Explain the effects of cooling rate on microstructure and properties with the help of Time-Temperature-Transformation diagram for carbon steel. **07**
(b) Enlist the effects on steel by alloying elements Aluminum, Chromium, Silicon, Nickel, Sulphur, Copper and Phosphorous. **07**

OR

- (b) Explain the effects of graphite on properties of Grey Cast iron, and compare Grey Cast iron with White Cast iron. **07**

- Q.3** (a) Write the procedure for Jominy end quench practical and discuss its conclusion. **07**
(b) Explain tempering and compare austempering and martempering. **07**

OR

- Q.3** (a) Explain method and effects of carburizing and cyaniding. **07**
(b) Explain structure and properties of malleable cast iron. **07**

- Q.4** (a) Write short note on copper alloys. **07**
(b) Which method is used for making Filament of light bulb? Write its advantages and other applications. **07**

OR

- Q.4** (a) Explain all four steps of power metallurgy. **07**
(b) Explain the composition, structure and properties of white metal used for bearing. **07**

- Q.5** (a) Which non-destructive test is used for finding defects on rail tracks? Explain it. **07**
(b) Explain cathodic protection against corrosion. **07**

OR

- Q.5** (a) Which non-destructive test is used for finding defects in welded joints? Explain it. **07**
(b) Explain metal and organic coatings. **07**
