

GUJARAT TECHNOLOGICAL UNIVERSITY

P.D.D.C Sem-III Examination May 2011

Subject code: X31902

Subject Name: Material Science & Metallurgy

Date: 20/05/2011

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 engineering materials. Write their significant application and correlate it with its properties. **07**
(b) Explain major mechanical and physical properties of engineering materials. **07**

- Q.2** (a) Differentiate between macro and micro examinations. Explain importance of microscopic examination in metallurgy. **07**
(b) Explain thermal equilibrium diagrams of binary alloy completely soluble in solid state. **07**

OR

- (b) Explain thermal equilibrium diagrams of binary alloy completely insoluble in solid state. **07**

- Q.3** (a) Draw iron carbon diagram and mention all major elements. **07**
(b) Explain effect of alloying element in steel. **07**

OR

- Q.3** (a) Explain eutectic, eutectoid and peritectic reaction. **07**
(b) Explain structure, properties and application of white cast iron. **07**

- Q.4** (a) Describe effect of quenching media on properties of steel during heat treatment. **07**
(b) Explain annealing process and justify its requirement. **07**

OR

- Q.4** (a) Mention all alloy of aluminum and explain any two. **07**
(b) Explain cathodic protection against corrosion. **07**

- Q.5** (a) Write principles, application, and limitation of all non destructive tests. **07**
(b) Explain all process step of powder metallurgy. **07**

OR

- Q.5** (a) Explain working principle of ultrasonic test and its method and applications. **07**
(b) What is Wrought iron? Enlist properties and application of it. **07**
