

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- IVth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 142104****Date: 31/05/2012****Subject Name: Metallurgy for Non metallurgists****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) Define corrosion. Discuss various protection methods to minimize corrosion. **07**
(b) Discuss various Heat treatment processes of copper alloys. Explain age hardening. **07**

- Q.2** (a) Draw and explain the Iron–Iron Carbide phase diagram. Label all important parameters of it. **07**
(b) What is carburizing? Discuss the liquid carburizing process in detail. **07**

OR

- (b) Explain the BCC and HCP structure and calculate their atomic packing factor. **07**

- Q.3** (a) Briefly explain the effect of various alloying elements on the properties of steel. **07**
(b) What is TTT diagram? Describe the effect of alloying elements on TTT diagram. **07**

OR

- Q.3** (a) Discuss the detailed classification of steel. Mention properties and applications of stainless steels. **07**
(b) Define hardenability and give significance of hardenability. Explain Jominy end quench test for hardenability measurement. **07**

- Q.4** (a) Give the classification of Cast iron. Mention the properties and applications of Grey cast iron. **07**
(b) Define rolling. Briefly discuss different rolling mills. **07**

OR

- Q.4** (a) Define casting. Explain the Centrifugal casting method. Compare it with Investment casting method. **07**
(b) What are different metal forming processes? Discuss about wire drawing methods. **07**

- Q.5** (a) What is Welding? Explain SMAW welding process. **07**
(b) “Material Testing is an important task for industry.” Justify the statement and classify material testing methods. **07**

OR

- Q.5** (a) Explain GMAW welding process and compare it with SAW welding process. **07**
(b) Enlist various NDT methods. Explain the Eddy current testing method and list its limitations. **07**
