

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 142104****Date: 02-01-2015****Subject Name: Metallurgy for Non Metallurgist****Time: 02:30 pm - 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) Define and explain: **07**
1. Hardness 2. Creep 3. Ductility

(b) Define Non Destructive Testing. Explain the principle of LPT and discuss the limitations. **07**

Q.2 (a) Enlist various Heat treatment processes of copper alloys. Explain age hardening. **07**

(b) What is Stainless steel? Enlist the properties of Stainless steel and classify it. Explain why stainless steels have good corrosion resistance. **07**

OR

(b) Mention the detailed classification of steel. Discuss about plain carbon steel. **07**

Q.3 (a) Describe about crystal planes and crystal directions. With neat diagram indicate close packed directions of BCC and FCC materials. **07**

(b) Give the significance of hardenability and explain the method adopted for hardenability measurement. **07**

OR

Q.3 (a) Draw and explain Iron–Iron Carbide equilibrium diagram. Label all components properly. **07**

(b) Draw Time - Temperature -Transformation (T T T) diagram for hypereutectoid steel and describe it. **07**

Q.4 (a) Mention the properties and applications of white cast iron. Also compare it with malleable cast iron. **07**

(b) What is rolling? Give applications. Describe about rolling mills. **07**

OR

Q.4 (a) Define casting. Explain the Investment casting method. **07**

(b) Enlist different metal forming processes. Discuss about Extrusion and Swaging at high temperature. **07**

Q.5 (a) Define welding. Explain GMAW welding process. **07**

(b) Define corrosion. Enlist types of corrosion. Discuss any one type of corrosion with causes and possible protection methods. **07**

OR

Q.5 (a) Explain GTAW welding process and compare it with SMAW welding process. **07**

(b) What do you mean by material failure? Write a note on failure due to Fatigue. **07**
