Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. - SEMESTER – IV • EXAMINATION – WINTER 2012

Subject code: 142104 **Date: 31/12/2012**

Subject Name: Metallurgy for non metallurgists

Time: 02.30 pm - 05.00 pm **Total Marks: 70**

Instructions:

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 (a) Define the following terms. **10**

i)	Bond.	ii)	Solid solution.
iii)	Phase.	iv)	Equilibrium.
v)	Heat treatment.	vi)	Hot working.
vii)	Soldering.	viii)	Fatigue.
ix)	Toughness.	x)	Crystal.

(b) (b) Explain in brief Anodic and cathodic coating. **04**

Q.2 (a) Explain in brief the following terms.
i) Allotropy of metal **03**
ii) Material failure due to the wear and high temperature. **04**

(b) i) What is metallurgy? Classify the metallurgy. **04**
ii) Classify the engineering materials. **03**

OR

(b) Explain thermo plastic & thermo set plastics in detail giving application of each **07**

Q.3 (a) What are the imperfections of crystals? Explain in brief any four. **07**

(b) List the advantages & limitations of electrochemical series give one illustration. **07**

OR

Q.3 (a) Explain the mechanism of plastic deformation of metals. **07**

(b) What is critical temperature? Explain the hot working & cold working process in context with the critical temperature. **07**

Q.4 (a) What is eutectic and Peritectic transformation? Explain it by giving example of each one. **07**

(b) What is dendrite? How it is formed? **07**

OR

Q.4 (a) Draw a neat sketch of optical system of metallurgical microscope & explain in brief. **07**

Q.4 (b) i) Explain the effect of carbon on plain carbon steels. **04**
ii) Explain the effect of microstructure on the properties of steels. **03**

Q.5 (a) List the alloying elements and explain the effect on aluminum alloy. **07**

(b) Explain the methods of powder production by witch high purity copper powder is produce commercially. **07**

OR

Q.5 (a) Explain the importance of TTT curves on heat treatment. **07**

(b) Explain in brief the factors effecting on hardenability. **07**

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