Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY
BE SEM-IV Examination-Nov/Dec-2011

Subject code: 142104 **Date: 02/12/2011**

Subject Name: Metallurgy for Non Metallurgists

Time: 02.30 pm -5.00 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 following terms: (i) Crystal, (ii) Grain, (iii) Solid Solution, (iv) Allotropy, (v) Hardness, (vi)Pattern (vii) Microstructure.	**07**
	(b)	(i) Explain in brief: Cold working & Hot working process	**04**
		(ii) Name various non destructive testing methods with example.	**03**
Q.2	**(a)**	Explain in brief various types of failure of metals under different types of load conditions including atmosphere.	**07**
	(b)	List the mechanical properties of metals and explain any three properties in detail.	**07**
		OR	
	(b)	Differentiate metallic & non metallic material with proper examples.	**07**
Q.3	**(a)**	Explain the phenomena of solidification of metallic material.	**07**
	(b)	State what information we can have from microscopic examination giving one example of microstructure.	**07**
		OR	
Q.3	**(a)**	Draw a neat sketch & label various components of metallurgical microscope and explain working of microscope.	**07**
	(b)	Explain the illumination mechanism of metallurgical microscope and show the use of various types of filters for microscopic examination.	**07**
Q.4	**(a)**	Draw a neat sketch of Iron Carbon equilibrium diagram and explain the salient points in the diagram.	**07**
	(b)	Define the following types of reaction. (i) Eutectic (ii) Eutectoid (iii) Peritectic (iv) Peritectoid	**07**
		OR	
Q.4	**(a)**	Define heat treatment process and explain in brief various types of annealing process giving examples.	**07**
	(b)	Explain the use of TTT curves.	**07**
Q.5	**(a)**	Explain the process of metal arc welding in detail.	**07**
	(b)	Name different types of non ferrous metals and explain the copper alloy in brief with its application.	**07**
		OR	
Q.5	**(a)**	Explain in brief any one casting process.	**07**
	(b)	List the different types of cast irons and explain any two in detail.	**07**

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