Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III • EXAMINATION – WINTER 2013

Subject Code: 133403 **Date: 30-11-2013**

Subject Name: Engineering Materials & Metallurgy

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)**	Write the Nitriding process and explain the advantages and disadvantages of Nitriding.	**07**
	(b)	How do you measure the hardenability of Steel by using Jominy end quench method with sketch?	**07**
Q.2	**(a)**	Write the various micro constituents of Iron and Steel. Draw and explain the Iron Carbon equilibrium diagram.	**07**
	(b)	Why Iron is called allotropic metal? Define Gibb's phase rule. Explain the interpretation of phase diagram with any one suitable diagram.	**07**
		OR	
	(b)	Explain in brief about Super conductors and its properties.	**07**
Q.3	**(a)**	Define fatigue test. Explain the fatigue testing procedure with sketch.	**07**
	(b)	How do you measure Hardness by using Brinell Test? Write the procedure of Brinell Hardness Testing.	**07**
		OR	
Q.3	**(a)**	Write the objectives and test procedure of Creep Testing with neat sketch.	**07**
	(b)	Explain about the Ductile – Brittle Transition and draw the temperature curve.	**07**
Q.4	**(a)**	Define Cyaniding. Write the cyaniding process, characteristics and uses.	**07**
	(b)	Define Normalizing and write the Normalizing procedure. Write any four quenching medium.	**07**
		OR	
Q.4	**(a)**	Define polymer. Write any three polymer materials for Commodity, Engineering and Specialty materials with corresponding applications.	**07**
	(b)	Write short notes about Bio degradable materials and its advantages.	**07**
Q.5	**(a)**	Write the effect of Molybdenum and Vanadium as an alloying element addition on Steel.	**07**
	(b)	Write the any four Nickel alloy. Explain the properties and applications of Nickel alloy.	**07**
		OR	
Q.5	**(a)**	Write the classification of Cast Iron. Explain any one cast iron characteristics and its applications.	**07**
	(b)	Write the effect of Silicon and Titanium as an alloying element addition on Steel.	**07**

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