Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B. E. Sem-II Examination May 2011

Subject code: 132101 Subject Name: Material science and Metallurgy

Date:25/05/2011 **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)**	Sketch and label blast furnace for production of pig iron. Explain its various Zones with functions. Write major reactions take place in Blast furnace	**10**
	(b)	Metallurgical industries in India.	**04**
Q.2	**(a)**	What is casting? Explain various steps, advantages and application of foundry.	**07**
	(b)	i) Give detailed classification of Engineering materials with important characteristics and applications.	**05**
		ii) Differentiate elasticity and plasticity.	**02**
		OR	
	(b)	i) Differentiate between n-type and p-type semi conductors.	**04**
		ii) Short note on effect of alloying element on properties of material.	**03**
Q.3	**(a)**	Describe different metal forming processes. Write about rolling and various rolling mills.	**07**
	(b)	i)What do you mean by metal joining? Write in detail about fusion welding.	**05**
		ii) Differentiate between Ductility and Malleability.	**02**
		OR	
Q.3	**(a)**	What is polymer? What is polymerization? List different polymerization mechanism. Explain one mechanism in detail.	**07**
	(b)	i) Draw flow diagram of Production of copper.	**04**
		ii) Define strain, toughness, hardness.	**03**
Q.4	**(a)**	What is corrosion? List out types of corrosion and explain any one type of corrosion	**07**
	(b)	i) List out properties of ceramic materials.	**04**
		ii) Differentiate between Thermoplastic and Thermosetting.	**03**
		OR	
Q.4	**(a)**	i) Which are advantages and limitations of powder metallurgy?	**04**
		ii) What are different corrosion prevention techniques.	**03**
	(b)	i) What is Composite material? Give its types with suitable examples.	**04**
		ii) Give flow diagram of extraction of aluminium.	**03**
Q.5	**(a)**	What are different hardness tests? Explain Rockwell hardness test.	**07**
	(b)	i)What is cement? Give flow diagram of dry process cement	**04**
		ii).Short note on Bessemer process.	**03**
		OR	
Q.5	**(a)**	Name various NDT techniques and explain in detail any one of it.	**07**
	(b)	i) Differentiate between direct and indirect Extrusion.	**02**
		ii) Define Ore and Minerals. Give different Ore available for Copper, Aluminium, Iron .	**05**

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