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

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

Subject code: 142102 **Date: 28/11/2011**

Subject Name: Principles of Extractive Metallurgy

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)**	What is the furnace used for iron production and draw the flow sheet of iron production.	**07**
	(b)	Explain the following term possibly with suitable example: i) Ore ii) Mineral iii) Pyrometallurgy iv) Hydrometallurgy v) Electrometallurgy	**07**
Q.2	**(a)**	List different pyrometallurgical processes and explain each one of them.	**07**
	(b)	Draw neat flow sheet for pure Copper extraction using pyrometallurgical route.	**07**
		OR	
	(b)	Draw flow sheet for Aluminum extraction.	**07**
Q.3	**(a)**	Explain the principle of leaching and discuss the leaching process in detail.	**07**
	(b)	Write short note: i) ion exchange & ii) solvent extraction.	**07**
		OR	
Q.3	**(a)**	What is the importance of hydrometallurgy? Give its advantages & disadvantages.	**07**
	(b)	Draw neat flow sheet of basic steps of hydrometallurgical operations.	**07**
Q.4	**(a)**	Differentiate between electro winning and electro refining.	**07**
	(b)	Differentiate between homogenous and heterogeneous reaction.	**07**
		OR	
Q.4	**(a)**	Explain the process of fused salt electrolysis of aluminum with diagram.	**07**
	(b)	i) Discuss importance of Ellingham diagram in metal extraction.	**04**
		ii) Write short note on Zone Refining	**03**
Q.5	**(a)**	Write short note on collision theory.	**07**
	(b)	Derive equation of half life period of 1st order reaction.	**07**
		OR	
Q.5	**(a)**	Define rate of reaction and discuss the factors affecting it.	**07**
	(b)	Compare molecularity and order of a reaction.	**07**

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