Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. Sem-IV Remedial Examination Nov/ Dec. 2010

Subject code: 142102

Subject Name: Principles of Extractive Metallurgy

Date: 03 /12 / 2010 **Time: 03.00 pm – 05.30 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)**	**i** Define refining. Give classification of refining	**03**
		ii Name pyrometallurgical processes for extraction of metals & explain each one in brief.	**04**
	(b)	**i** Draw a general flow sheet for metal extraction from ore.	**03**
		ii State Faraday's first & second law of electrolysis.	**04**
Q.2	**(a)**	What is hydrometallurgy? Give basic steps of hydrometallurgical operations. (Draw the flow sheet).	**07**
	(b)	What is the importance of hydrometallurgy? Give its advantages & disadvantages.	**07**
		OR	
	(b)	Name various leaching methods and explain them in brief.	**07**
Q.3	**(a)**	Write short note on (i) Ion Exchange Method (ii) Solvent extraction Method	**07**
	(b)	Draw flow sheet of extraction of iron.	**07**
		OR	
Q.3	**(a)**	Draw flow sheet of Copper production.	**07**
	(b)	Write difference between (i) Sintering and Pelletizing (ii) Drying and Calcining (iii) Melting and smelting	**07**
Q.4	**(a)**	What is heterogeneous and homogenous reaction? Define velocity of a reaction and discuss factors affecting velocity of a reaction.	**07**
	(b)	Discuss collision theory of reaction kinetics.	**07**
		OR	
Q.4	**(a)**	Calculate the current efficiency of nickel sulphate bath containing 34.2 gms of Ni when 200 amp current was passed for 10 min. All Ni was deposited on the cathode during this time.(atomic weight of Ni= 58.6 gm/mol)	**07**
	(b)	Discuss theory of absolute reaction rate.	**07**
Q.5	**(a)**	What is electrometallurgy? Describe the basic concept of electrometallurgy.	**07**
	(b)	Draw a simple flow sheet for extraction of Aluminum from bauxite ore.	**07**
		OR	
Q.5	**(a)**	Write a brief note on (i) Fire refining and electro refining (ii) Zone refining	**07**
	(b)	Derive equation for half life period of first order reaction.	**07**

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