Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2015

Subject Code: 2142102 **Date:01/06/2015**

Subject Name: Principles of Extractive Metallurgy

Time:10:30am-1.00pm **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 and explain oxide free energy diagram. Explain its importance in Pyrometallurgy. List out limitations of this diagram.	**07**
	(b	Define and explain on (i) Calcination (ii)Smelting	**07**
Q.2	**(a)**	Define Hydrometallurgy. Describe the advantages and limitations of Hydrometallurgical extraction processes.	**07**
	(b	Explain the principle of leaching and discuss the leaching process in brief.	**07**
		OR	
	(b	Draw neat flow sheet for pure Copper extraction using Pyrometallurgical route.	**07**
Q.3	**(a)**	Write and explain a note on Solvent extraction process.	**07**
	(b	Describe bacterial leaching process. Explain the effect of bacteria on leaching rate and extent of recovery.	**07**
		OR	
Q.3	**(a)**	Draw a general flow sheet for metal extraction from ore. What is roasting ? Explain fluidized bed roasting process in brief.	**07**
	(b	Differentiate between homogenous and heterogeneous reaction.	**07**
Q.4	**(a)**	Explain in detail about Ion Exchange process .	**07**
	(b	What is electrometallurgy? Differentiate between electro-winning and electro-refining.	**07**
		OR	
Q.4	**(a)**	What is Order of reactions and Molecularity? Differentiate between Order and Molecularity.	**07**
	(b	Draw a simple flow sheet for extraction of Aluminum from bauxite ore.	**07**
Q.5	**(a)**	Draw and explain the process flow sheet for iron and steel Production.	**07**
	(b	Draw flow sheets for magnesium metal extraction by different ways .	**07**
		OR	
Q.5	**(a)**	Discuss collision theory of reaction kinetics.	**07**
	(b	Write note on : Physico-chemical principles of fused salt electrolysis.	**07**

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