Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER • 2014

Subject Code: 142102 **Date: 20-06-2014**

Subject Name: Principles of Extractive Metallurgy

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)**	Draw process flow sheet of Cu extraction with important parameters involved in the process.	**07**
	(b)	Discuss different steps of fluidized bed roasting process. Mention the importance of Fluidization curve.	**07**
Q.2	**(a)**	Define and Explain: I. Refining II. Calcination III. Pelletizing.	**07**
	(b)	Discuss about oxide free energy diagram. Give its importance in Extractive metallurgy.	**07**
		OR	
	(b)	Write a note on chloride free energy diagram.	**07**
Q.3	**(a)**	Explain flash smelting process for copper extraction.	**07**
	(b)	Mention the advantages and limitations of Hydrometallurgical extraction processes.	**07**
		OR	
Q.3	**(a)**	Define Smelting. Differentiate between Matte smelting and Reduction smelting.	**07**
	(b)	Define Pressure leaching. Write the requirements of pressure leaching. Why it is carried out in autoclave?	**07**
Q.4	**(a)**	Draw process flow sheet of Pb extraction. Write all important parameters involved in the process.	**07**
	(b)	Write a note on ion-exchange processes.	**07**
		OR	
Q.4	**(a)**	Draw and explain process flow sheet for Iron Production.	**07**
	(b)	What is microbial leaching? Explain. Write the effect of bacteria on leaching rate and extent of recovery.	**07**
Q.5	**(a)**	Discuss collision theory of reaction kinetics.	**07**
	(b)	Discuss the electrochemical principle involved in electro-refining of metals using molten salts. Explain with suitable example.	**07**
		OR	
Q.5	**(a)**	What do you mean by Reaction Rate? Explain factors affecting Reaction Rate.	**07**
	(b)	Write a note on Electrowinning. Give its applications.	**07**

****