

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- IVth SEMESTER-EXAMINATION – MAY/JUNE- 2012****Subject code: 142102****Date: 25/05/2012****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 and explain the process flow sheet of Cu extraction with important parameters involved in the process.	07
	(b)	Define and explain oxide free energy diagram. Explain its importance in pyrometallurgy.	07
Q.2	(a)	Discuss different steps of fluidized bed roasting process. Mention the importance of Fluidization curve.	07
	(b)	Define roasting. Describe the Multiple Hearth roaster. Give its drawbacks.	07
		OR	
	(b)	Write a note on chloride free energy diagram. Compare it with sulphide free energy diagram.	07
Q.3	(a)	Define smelting. Explain flash smelting process.	07
	(b)	Define Leaching. Explain the Pressure leaching process. Why it is carried out in autoclave?	07
		OR	
Q.3	(a)	Define pyrometallurgy. Discuss different advantages & Limitations of pyrometallurgical extraction process.	07
	(b)	Describe microbial leaching process. Explain the effect of bacteria on leaching rate and extent of recovery.	07
Q.4	(a)	Write and explain a note on Solvent extraction process.	07
	(b)	What do you mean by fused salt electrolysis? List the factors lead to a lower current efficiency in electrolysis of fused salts. Describe the methods to minimize these.	07
		OR	
Q.4	(a)	Define Hydrometallurgy. Describe the advantages and limitations of Hydrometallurgical extraction processes.	07
	(b)	Discuss the electrochemical principle involved in electrorefining of metals using molten salts. Explain the principle in reference to refining of aluminum.	07
Q.5	(a)	Draw and explain the process flow sheet for steel Production.	07
	(b)	Explain theory of absolute reaction rate.	07
		OR	
Q.5	(a)	Draw and explain the process flow sheet of Pb extraction with important parameters involved in the process.	07
	(b)	What is heterogeneous and homogenous reaction? Define velocity of a reaction and discuss factors affecting velocity of a reaction.	07
