

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**
- OR**
- (b) Write a note on chloride free energy diagram. **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**
