

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER 2013****Subject Code: 152102****Date: 16-05-2013****Subject Name: Non-Ferrous 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) List Important ores / minerals with their chemical formula of Aluminum, Lead, Zinc, Copper, Tin, Silver and Magnesium. **07**
- (b) With the help of flow sheet explain the process of tin extraction from its concentrate. Explain with thermodynamic reasons that why tin is produced by three stages process? **07**
- Q.2** (a) Explain the process for lead extraction from its ore. Draw the flow sheet with important parameters involved in the process. **07**
- (b) Discuss Bayer process for alumina production and give the flow sheet. Why high pressure is used in Bayer process? **07**
- (b) What is Blister copper? Explain the Electrolytic refining process of Blister copper. How the harmful impurities in electrical grade copper are eliminated during copper electrolytic refining? **07**
- Q.3** (a) Explain Hall-Heroult process of Al extraction. Discuss the Factors affecting current efficiency in Hall-Heroult process. **07**
- (b) Explain the WORCRA process for Copper production. Mention the factors affecting efficiency of WORCRA process. **07**
- OR**
- Q.3** (a) Explain the ALCOA process for Aluminum production. Mention that why does the ALCOA process consume less energy than the Hall-Heroult process. **07**
- (b) Differentiate between Single step and multistep continuous processes for copper extraction. Explain Mitsubishi process for Copper production in brief. **07**
- Q.4** (a) Explain the pyrometallurgical process of nickel extraction from its sulphide ore. Draw the flow sheet with important parameters involved in the process. **07**
- (b) Explain the hydrometallurgical process of zinc from its ores and draw the process flow sheet. Give the advantages of hydrometallurgical extraction of Zinc on pyrometallurgical extraction. **07**
- OR**
- Q.4** (a) Explain the Imperial Smelting process for production of zinc with necessary sketches. **07**
- (b) Give the ores of nickel with their chemical formula. Explain the carbonyl process for refining of nickel. **07**
- Q.5** (a) Write a note on Occurrence of gold. Discuss the amalgamation and chlorination process for gold extraction. **07**
- (b) With the help of line diagram, explain the Pidgeon process for extraction of magnesium mentioning the thermodynamic reasons. **07**
- OR**
- Q.5** (a) With the help of a flow sheet explain briefly the fire refining of tin. **07**
- (b) Explain the DOW process for extraction of magnesium **07**

