

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2018****Subject Code:2152107****Date:20/11/2018****Subject Name:Extraction of Non Ferrous Metals****Time: 10:30 AM TO 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.

		MARKS
Q.1	(a) Write short note on Khetri copper plant.	03
	(b) Describe SWOT analysis of Indian nonferrous metal industries.	04
	(c) With the help of line diagram, explain the Pidgeon process for extraction of magnesium mentioning the thermodynamic reasons.	07
Q.2	(a) Justify the purpose of roasting and smelting in the extraction of Copper.	03
	(b) Using phase diagram of Cu-Cu ₂ S system, explain why it is not possible to use a bottom-blown converter to produce blister copper from matte.	04
	(c) Explain the WORCRA process for Copper production. Mention the factors affecting efficiency of WORCRA process.	07
OR		
	(c) What is anode slime? Explain the process of precious metal recovery from it.	07
Q.3	(a) Why carbon electrode and cryolite are used in Hall-Héroult process.	03
	(b) Discuss the Factors affecting current efficiency in Hall-Heroult's process of Al extraction.	04
	(c) Discuss Bayer process for alumina production and give the flow sheet.	07
OR		
Q.3	(a) Why the carbothermic reduction process not used for extraction of aluminum on commercial scale?	03
	(b) Explain the three-layer process of Aluminum refining.	04
	(c) Explain the ALCOA process for Aluminum production. Why does the ALCOA process consume less energy than the Hall-Héroult process?	07
Q.4	(a) Differentiate between Single step and multistep continuous processes for copper extraction.	03
	(b) Explain the Electrolytic refining process of Blister copper.	04
	(c) Explain the process for lead extraction from its ore. Draw the flow sheet with important parameters involved in the process.	07
OR		
Q.4	(a) Give the ores of nickel with their chemical formula.	03
	(b) Explain the carbonyl process for refining of nickel.	04
	(c) Discuss the amalgamation and chlorination process for gold extraction.	07
Q.5	(a) In the pyrometallurgical extraction of Zinc why we not used the technique of smelting and converting, as applied in the case of copper?	03
	(b) Differentiate between horizontal and vertical retorts in pyrometallurgical extraction of Zinc.	04

- (c) With the help of flow sheet explain the process of tin extraction from its concentrate. Why tin is produced by three stages process? Explain with thermodynamic reasons. **07**

OR

- Q.5** (a) Discuss the parke's process for silver recovery from lead. **03**
(b) Why the scrap iron is used in second and third stage of smelting in tin extraction process. **04**
(c) Explain the Imperial Smelting process for production of zinc with necessary sketches. List out the advantages. **07**
