

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– V (New) EXAMINATION – WINTER 2019****Subject Code: 2152107****Date: 21/11/2019****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) Enlist the aluminum, lead and copper industries in India.	03
	(b) Describe SWOT analysis of Indian nonferrous metal industries.	04
	(c) Discuss about the production and consumption of various non-ferrous metals in India.	07
Q.2	(a) What are the important ores of aluminum? Give their chemical formulae.	03
	(b) Explain why does the ALCOA process consume less energy than the Hall-Héroult process?	04
	(c) Discuss Bayer process for alumina production and give the flow sheet.	07
OR		
	(c) Explain various factors governing fused salt electrolysis of alumina.	07
Q.3	(a) What is blister copper? Name the elements present in it as impurities.	03
	(b) Explain the TOOTH process for Aluminum production.	04
	(c) Discuss the chemistry of copper smelting. Explain any of the flash smelting techniques with the help of a sketch. Give its advantages and limitations of over other processes.	07
OR		
Q.3	(a) Mention the relationship between slag losses and matte grades in copper smelting operation.	03
	(b) Write brief on ALCAN process.	04
	(c) Explain Mitsubishi process for Copper production.	07
Q.4	(a) Explain how electrolytic refining of tin is carried out.	03
	(b) Can Si alone be used as a reducing agent in Pidgeon process? Justify your answer.	04
	(c) Explain the scheme of operations in the hydrometallurgical extraction of zinc.	07
OR		
Q.4	(a) Why $MgCO_3$ cannot be used for the Pidgeon process?	03
	(b) Why is scrap iron used in lead blast furnace? Discuss.	04
	(c) Furnish a flow sheet for obtaining nickel from its sulphide ore with relevant process details.	07
Q.5	(a) Explain the carbonyl process for refining of nickel.	03

- (b) What is byproduct in any metallurgical extraction? Give two examples. **04**
- (c) Discuss the amalgamation and chlorination process for gold extraction. **07**

OR

- Q.5** (a) Give the ores of nickel with their chemical formula. **03**
- (b) Differentiate between reverberatory furnace smelting and rotary furnace smelting process for tin extraction. **04**
- (c) Write a note on occurrence of silver. Discuss the Parke's process for silver recovery from lead. **07**
