Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2152107 **Date: 03/05/2017**

Subject Name: Extraction of Non Ferrous Metals

Time: 02:30 PM to 05:00 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		**Short Questions**	**14**
	1	Process of removal of carbon dioxide by heating calamine	1
	2	Alumina can be reduced to aluminium by___	1
	3	The gas evolved during the roasting of sulfide ores is_____	1
	4	Name the process used for treatment of oxidized Cu ore	1
	5	In three layer process of Al refining middle layer is of ____	1
	6	Why the scrap iron is used in lead blast furnace?	1
	7	Name one ore of Nickel with chemical formula.	1
	8	Name one ore of Zinc with chemical formula.	1
	9	Name one ore of Tin with chemical formula.	1
	10	Define sintering.	1
	11	Define smelting.	1
	12	Why scrap iron is used in smelting in tin extraction process?	1
	13	Why MgO cannot be reduced by carbon to produce	1
	14	In pyrometallurgical extraction of Zinc why the partial pressure of CO in retorts gases has to be maintained at a high	1
Q.2	**(a)**	Enlist the Aluminum, lead and copper industries in India.	**03**
	(b)	Explain the flow sheet for silver extraction.	**04**
	(c)	Discuss the amalgamation and chlorination process for gold extraction.	**07**
		OR	
	(c)	Explain the Imperial Smelting process for production of zinc with necessary sketches.	**07**
Q.3	**(a)**	Explain why does the ALCOA process consume less energy than the Hall-Héroult process?	**03**
	(b)	Discuss role cryolite in Electrolysis of Aluminium.	**04**
	(c)	Describe Bayer process for alumina production and give the flow sheet.	**07**
		OR	
Q.3	**(a)**	Explain effects of byproducts on environment in Al production.	**03**
	(b)	Explain the TOOTH process for Aluminum production.	**04**
	(c)	Explain Hall-Heroults process of Al extraction. Discuss Factors affecting current efficiency of process.	**07**
Q.4	**(a)**	Mention the relationship between Slag losses and Matte grades in Copper smelting operation.	**03**
	(b)	Explain the WORCRA process for Copper production.	**04**
	(c)	Describe process flow sheet of Cu extraction with important parameters involved. Give purpose of roasting in this process.	**07**
		OR	

Q.4	**(a)**	Discuss the method of copper recovery from copper slag.	**03**
	(b)	Explain in detail converting of matte in converter.	**04**
	(c)	Discuss about Single step and multistep continuous processes for copper extraction. Differentiate between these.	**07**
Q.5	**(a)**	Explain that how electrolytic refining of tin is carried out.	**03**
	(b)	Explain the Pidgeon process for extraction of magnesium.	**04**
	(c)	Explain the pyrometallurgical process of nickel extraction from its sulphide ore.	**07**

OR

Q.5	**(a)**	Name three ores of Magnesium with their chemical formula.	**03**
	(b)	Differentiate between reverberatory furnace smelting and rotary furnace smelting process for tin extraction.	**04**
	(c)	Explain the process for lead extraction from its ore. Draw the flow sheet with important parameters involved in the process.	**07**

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