Seat No.:		Enrolment No
GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-V (OLD) - EXAMINATION – SUMMER 2017		

Subject Code: 152102 Date: 05/05/2017 **Subject Name: Non - Ferrous Extractive Metallurgy** 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. 0.1 (a) With the help of line diagram, explain the Pidgeon process for extraction of 07 magnesium covering the thermodynamic aspects. (b) Write a note on Occurrence of gold. Explain the cyanidation process for gold 07 extraction. (a) List important ores and locations of their major deposits in India for **Q.2** 07 Aluminum, copper and Zinc. Write short note on Khetri copper plant. (b) Explain the process of tin extraction from its concentrate. Why scrap iron is 07 used in second and third stage of smelting in tin extraction process. OR (b) Name ores of Tin with their chemical formula. With the help of a flow sheet 07 explain briefly the fire refining of tin. Q.3 (a) Discuss Bayer process for alumina production with the flow sheet. Why high 07 pressure is used in Bayer process? **(b)** Define refining. Explain the three–layer process of Aluminum refining. 07 OR Q.3 (a) Explain Hall-Heroults process of Al extraction. Why carbon electrode and 07 cryolite are used in Hall-Héroult process. (b) Explain the ALCOA process for Aluminum production. Explain why the 07 ALCOA process consumes less energy than the Hall-Héroult process. **Q.4** (a) Describe process flow sheet of Copper extraction with important parameters 07 involved in process. Mention the purpose of smelting in the extraction of Copper (b) Explain the WORCRA process for Copper production. Enlist factors affecting 07 efficiency of WORCRA process. OR (a) Explain the Electrolytic refining process of Blister copper. Explain how the 07 **Q.4** harmful impurities in electrical grade copper, eliminated during electrorefining. **(b)** Describe Mitsubishi process for Copper production. 07 Explain the pyrometallurgical process of nickel extraction from its sulphide **Q.5** 07 ore. Draw the process flow sheet. (b) Explain the process for lead extraction from its ore. Draw the flow sheet. Why 07 scrap iron is used in lead blast furnace? OR (a) Give the ores of nickel with their chemical formula. Explain the carbonyl Q.5 07 process for refining of nickel. Explain the Imperial Smelting process for production of zinc with necessary **07** sketches.

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