Enrolment No.\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VIII (NEW) - EXAMINATION - SUMMER 2017** Subject Code: 2182108 Date: 04/05/2017 Subject Name: Advanced Non Ferrous Extractive Metallurgy (Department **Elective -II**) 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. 0.1 (a) Give the name of ores for following metals with chemical formula. 07 Mn, Co, Ta, W,U,Nb, Zr. (b) Explain briefly about Pyro, hydro and electro metallurgy for extraction of 07 metals. 0.2 (a) Which are rare earth elements? List out production methods for production of 07 rare – earth metals from their compounds. Enlist the Indian atomic power plants and Nuclear Power plants with their 07 **(b)** location & capacity. OR (b) What are resources for Vanadium? Draw flow sheet for recovery of vanadium 07 pentoxide from carnotite uranium ore. List out application of Manganese metal. What are cell parameters for 0.3 (a) 07 electrolysis of Manganese. **(b)** Write ores of Molybdenum. How recovery of Molybdenite is done from cu-Mo 07 ores. OR Q.3 (a) Describe the extraction of metallic Co from Cu-Co oxide. 07 (b) List out properties and application of Tantalum. Draw flow diagram of recovery 07 of Tantalum. Discuss why  $UO_2$  to is converted to fluoride and not reduced by hydrogen, 07 0.4 (a) carbon or calcium to get pure uranium. Explain flow diagram for production of thorium sponge. 07 **(b)** OR **0.4** (a) List out sources of Thorium. How recovery of Monazite is done? Explain 07 briefly. **(b)** How Zirconium is useful as a cladding element in nuclear reactors? 07 **Q.5** Draw flow diagram of production of pure Zirconium oxide and Zirconium 07 **(a)** sponge. What are sources of Beryllium. How reduction of Beryllium compounds can be **(b)** 07 done? OR Q.5 (a) What are application, property and sources of Titanium. 07

(b) Explain briefly production of Titanium Tetrachloride from Ilmenite. 07

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