

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER V • EXAMINATION – WINTER - 2012****Subject code: 152102****Date: 12-01-2013****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.

- Q.1** (a) Explain 'Converting Operation' for copper manufacturing by pyrometallurgical route from sulphide concentrate. **07**
(b) Explain Hall Heroult process with suitable illustration and Describe factors affecting this process. **07**
- Q.2** (a) Draw flow sheet of Bayer's process and describe factors affecting this process. **07**
(b) Write short notes (Any Two) : **07**
i) Flash Smelting Process ii) Mitsubishi Process iii) Worcra Process
- OR**
- (b) Describe Zinc extraction from its sulphide ore using pyro- metallurgical method. **07**
- Q.3** (a) Draw flow sheet for Nickel production from its sulphide ore. **07**
(b) Describe Lead Bullion refining process. **07**
- OR**
- Q.3** (a) Describe cyanidation process used for extraction of Gold from its ore. **07**
(b) Describe lead production from its sulphide ore in the blast furnace. Explain the role of Iron scrap addition in the charge ? **07**
- Q.4** (a) Draw flow sheet of Zinc extraction using hydro- metallurgical route. **07**
(b) Draw flow sheet for pyro -metallurgical extraction of copper from copper sulphide ore. **07**
- OR**
- Q.4** (a) Describe in brief the Imperial Smelting Process (ISP) for production of Zinc. List advantages of ISP over other processes. **07**
(b) Draw flow sheet for pyro-metallurgical refining of impure Tin produced during smelting of Tin concentrate. **07**
- Q.5** (a) Explain with diagram the selective reduction of Nickel from its oxide ore . Describe Carbonyl process for refining Nickel. **07**
(b) Describe 'Pidgeon Process' for production of Magnesium. **07**
- OR**
- Q.5** (a) Draw flow sheet of Tin extraction from its Cassiterite ore concentrate (SnO₂) **07**
(b) Draw flow sheet for extraction of Gold from Kolar Gold Ore. **07**
