

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Sem. - V - Examination – June- 2011****Subject code: 152102****Subject Name: Non-Ferrous Extractive Metallurgy****Date: 22/06/2011****Time: 10:30 am – 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.

- Q.1** (a) Draw flow sheet for Bauxite refining showing operating conditions to produce high purity anhydrous Alumina. List factors affecting the Bayer's process. **07**
- (b) How Aluminium metal is produced from Alumina (Al_2O_3) ? **07**
Explain the process with suitable illustration. List factors affecting the Hall Heroult process.

- Q.2** (a) Draw flow sheet for pyro -metallurgical extraction of copper from copper sulphide ore. **07**
- (b) Write short notes (Any Two) : **07**
i) Flash Smelting Process ii) Noranda Process
iii) Worera Process

OR

- (b) Describe 'Converting Operation' to produce Blister Copper during the processing of copper sulphide concentrate. **07**

- Q.3** (a) Draw flow sheet for Nickel production from its sulphide ore by INCO process. **07**
- (b) Explain with diagram the selective reduction of Nickel from its oxide ore (Lateritic ore) . Describe Carbonyl process for refining Nickel. **07**

OR

- Q.3** (a) Draw flow sheet for production of Base Bullion (Impure Lead) from lead ore in the blast furnace. What is the role of Iron scrap addition in the charge to blast furnace ? **07**

- (b) Describe the refining process to produce refined lead from base bullion. **07**

- Q.4** (a) Draw flow sheet of Zinc extraction from its sulphide concentrate by using hydro metallurgical route. **07**
- (b) Draw flow sheet of Zinc extraction from its sulphide ore by using pyro-metallurgical method. **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) Describe cyanidation process used for extraction of Gold from its ore. **07**

- Q.5** (a) Draw flow sheet for extraction of Gold from Kolar Gold Ore. **07**
- (b) Describe 'Pidgeon Process' for production of Magnesium from calcined dolomite. **07**

OR

- Q.5** (a) Draw flow sheet of Tin extraction from its Cassiterite ore concentrate (SnO_2) **07**
- (b) Draw flow sheet for pyro-metallurgical refining of impure Tin produced during smelting of Tin concentrate. **07**
