

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV • EXAMINATION – WINTER • 2014****Subject Code: 142102****Date: 29-12-2014****Subject Name: Principles of Extractive Metallurgy****Time: 02:30 pm - 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) Differentiate between electro-winning and electro-refining **07**
(b) What are different purification processes? Write in detail about solvent extraction process. **07**
- Q.2** (a) What do you mean by Ellingham diagram? Explain in detail standard free energy diagram for oxides **07**
(b) What is extractive metallurgy? List out main sources for metals? Give basic flow diagram of extractive metallurgy. **07**
- OR**
- (b) What are different Pyro metallurgical processes? Explain fluidized bed roasting method. **07**
- Q.3** (a) What is Order of reactions and Molecularity? Differentiate between Order and Molecularity. **07**
(b) What is Leaching. Write types of leaching. Explain briefly about pressure leaching. **07**
- OR**
- Q.3** (a) Give flow diagram of extraction of aluminium. **07**
(b) Draw a neat flow sheet for extraction of 99.9% pure copper from its sulphide ore using pyrometallurgical route. **07**
- OR**
- Q.4** (a) Draw flow sheet of extraction of iron and steel. **07**
(b) Define smelting? Differentiate between Matte smelting and Reduction smelting processes with suitable examples. **07**
- OR**
- Q.4** (a) Draw flow diagram for extraction of Zinc from its ore. **07**
Q.4 (b) What is Arrhenius equation? Derive it. **07**
- Q.5** (a) What do you mean by rate of a reaction? Discuss various factors affecting rate of a reaction. **07**
(b) Explain briefly about fused salt electrolysis. **07**
- Q.5** (a) What is Hydrometallurgy? Do comparison with Pyrometallurgy in terms of advantages, limitations and applications **07**
(b) Short note on Collision theory of reaction kinetics. **07**
