Seat No.: _____ Enrolment No._____

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 purifications 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**

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