

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2023

Subject Code: 3152107

Date:07-12-2023

Subject Name: Non ferrous Extractive Metallurgy

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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What is extractive metallurgy? Give basic flow diagram of extractive metallurgy.	03
	(b) Compare Pyro metallurgy and Hydro metallurgy processes.	04
	(c) Explain oxide free energy diagram in pyrometallurgy with neat diagram.	07
Q.2	(a) Which are ores/ Minerals of Ti, Mg and Al? Write name and chemical composition.	03
	(b) List out all Hydro metallurgy process. Write merit and demerits of Hydro metallurgy.	04
	(c) Define Roasting. Discuss mechanism of roasting in detail.	07
OR		
	(c) How refining of alumina is done in Aluminum extraction? What is anode effect in electrolysis of aluminum	07
Q.3	(a) Differentiate between palletizing and sintering.	03
	(b) Differentiate electro winning and electro refining.	04
	(c) Explain smelting. Differentiate between Matte smelting and Reduction smelting processes.	07
OR		
Q.3	(a) Write note on autoclave in pressure leaching.	03
	(b) Derive Arrhenius equation and activation energy.	04
	(c) Derive the relation between reaction rate and concentration for first and second order.	07
Q.4	(a) List out properties and application of Aluminum.	03
	(b) Write limitations of Ellingham diagrams.	04
	(c) Discuss Bayer process for alumina production.	07
OR		
Q.4	(a) Draw flow diagram of refining of Tin.	03
	(b) Explain Pigeon process.	04
	(c) With a neat sketch, explain Mitsubishi process for extraction of Copper.	07
Q.5	(a) Explain briefly Imperial smelting process of Zinc.	03
	(b) Discuss Pyro metallurgical extraction of Nickel.	04
	(c) Explain in brief on microbial leaching.	07
OR		
Q.5	(a) Draw flow diagram of Recovery of Precious metals from Anode slime.	03
	(b) Discuss Kroll process for production of Ti.	04
	(c) Discuss any one process for production of Lead.	07
