

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER– III(NEW) EXAMINATION – WINTER 2022****Subject Code:3132103****Date:22-02-2023****Subject Name:Mineral Processing****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.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) Define Concentrate, locking and unlocking of minerals and gangue. Draw flow diagram of Mineral processing including all processes.	03
	(b) List out and explain physical and mechanical properties of ores /Minerals like Bauxite and Magnetite.	04
	(c) Write name and chemical composition of ores/minerals of metals like Titanium, Magnesium, Tin, Lead, Iron, Copper and Aluminum.	07
Q.2	(a) In Comminution weather crushing is important? Do classification of Crushers.	03
	(b) Short note on resources of metals.	04
	(c) A material is crushed in a black jaw crusher and the average size of particle reduced from 6cm to 2 cm with consumption of energy at the rate of 6hp hr/tonne. What will be the consumption of energy needed to crush the same material of average size 6cm to an average size of 2 cm? a) Assuming Rittinger's law applies.	07
OR		
	(c) Compare black, dodge and universal crushers in detail with line diagram.	07
Q.3	(a) Give detailed classification of screening.	03
	(b) Explain motion of charge in Ball mill.	04
	(c) Derive the equation for angle of nip for roll crusher. If coefficient of friction between the rock and steel is 0.6, what is minimum diameter of the roll to reduce 4 cms pieces of rock to 1 cm.	07
OR		
Q.3	(a) List out factors affecting the capacity of grinding mills.	03
	(b) Draw beneficiation flow sheets of Hemetite ore.	04
	(c) What are the effect of particle size and shape on screening operation?	07
Q.4	(a) Expalin factors affecting Jigging process.	03
	(b) Calculate free and hindered settling ratio.	04
	(c) Write note on forth flotation with neat diagram.	07
OR		
Q.4	(a) Explain different industrial screening.	03
	(b) What is sink and float process? Discuss.	04
	(c) Explain Wilfley Table with diagram.	07
Q.5	(a) Discuss briefly about Electrostatic Separation.	03
	(b) Draw simplified beneficiation flow sheets of Sulphide ore of metal.	04
	(c) What are the purpose of collectors, frothers and activators in flotation process?	07
OR		
Q.5	(a) Explain mediums of grinding in brief.	03
	(b) Explain in brief Drum Separator.	04
	(c) Explain Air classifier.	07