Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (New) EXAMINATION – WINTER 2018

Subject Code: 2132103 Date: 12/12/2018

Subject Name: Mineral Processing

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**

			Marks	Attribute
Q.1*	**(a)**	Explain in brief about sources of metals.	**03**	**(R)**
	(b)	Draw basic flow diagram of mineral processing including all processes.	**04**	**(U)**
	(c)	List out ores/minerals of metals like Fe, Cu, Al, Pb, Zn, Sn and Mg with their chemical composition.	**07**	**(U)**
Q.2	**(a)**	Define Ore, Mineral and Concentrate.	**03**	**(U)**
	(b)	What are Physical and chemical characteristics of minerals.	**04**	**(A)**
	(c)	Give classification of Crushers. Explain black Jaw Crusher With Neat Diagram.	**07**	**(U)**
		OR		
	(c)	A material is crushed in a black jaw crusher and the average size of particle reduced from 5cm to 1.25cm 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 8cm to an average size of 2.5 cm? a) Assuming Rittinger's law applies b) Assuming Kick's law applies	**07**	**(A)**
Q.3	**(a)**	Differentiate between primary and secondary crushers.	**03**	**(R)**
	(b)	Brief note on sieve Analyzer.	**04**	**(U)**
	(c)	Explain motion of charge in Tumbling mill and derive the equation of critical speed	**07**	**(A)**
		OR		
Q.3	**(a)**	Discuss different grinding media.	**03**	**(R)**
	(b)	What are different factors influencing grinding process.	**04**	**(U)**
	(c)	What is angle of nip? For roll crusher derive an expression relating angle of nip, dia of rolls, and that of particles and set of rolls. If coefficient of friction between the rock and steel is 0.5, what is the minimum diameter of the roll to reduce 5.5 cm pieces of rock to 1.5 cm?	**07**	**(A)**
Q.4	**(a)**	Give detailed classification of screening.	**03**	**(U)**
	(b)	Draw Simplified beneficiation Flow Sheets of Bituminous coal.	**04**	**(U)**
	(c)	What is classification? Give different types of classifier and explain air classifier	**07**	**(A)**
		OR		
Q.4	**(a)**	Derive the equation for free settling ratio as per Newton's law. If mixture of quartz (Sp.gr. 2.65 gm/cc) is settling in water, find free settling ratio of quartz and galena when Newton-Rittingrs 's condition prevails.	**03**	**(U)**
	(b)	Short notes on Heavy media separation.	**04**	**(U)**
	(c)	Short note Froth Floatation .	**07**	**(U)**
Q.5	**(a)**	Draw Simplified beneficiation Flow Sheets of Iron ore.	**03**	**(A)**
	(b)	Discuss about Thickening.	**04**	**(U)**
	(c)	Discuss Jigging Operation.	**07**	**(U)**
		OR		
Q.5	**(a)**	What is Thickening process? Discuss it briefly.	**03**	**(U)**
	(b)	Draw Simplified beneficiation Flow Sheets of copper ore.	**04**	**(A)**
	(c)	Explain about magnetic separator.	**07**	**(U)**