

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2021****Subject Code:3132103****Date:19-02-2022****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.
4. Simple and non-programmable scientific calculators are allowed.

	Marks
Q.1 (a) Discuss various sources of metals.	03
(b) List out Physical and chemical characteristics of magnetite and chalcopryrite ore.	04
(c) Draw a flow chart showing principal steps in a mineral processing. Explain each step. List merits of mineral processing.	07
Q.2 (a) Define Ore ,Mineral and Concentrate.	03
(b) List out ores and Minerals for metal like Sn, Cu, Fe, Mg with their chemical composition.	04
(c) Give classification of Crushers. Explain black Jaw Crusher With Neat Diagram.	07
OR	
(c) A material is crushed in a black jaw crusher and the average size of particle reduced from 6cm 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 Rittingers's law applies.	07
Q.3 (a) Explain locking and unlocking of minerals and gangue.	03
(b) Define liberation, Comminution, sizing and mesh no.	04
(c) What is Grinding? Classify the various zones created in ball mill during grinding operation.	07
OR	
Q.3 (a) What do you understand by 'open circuit' and 'closed circuit' grinding?	03
(b) If the coefficient of friction between rock and steel is 0.5, what is minimum diameter of roll to reduce 4 cm pieces of rock to 1 cm.	04
(c) Write Short note on Heavy media separation.	07
Q.4 (a) Discuss Thickening process briefly.	03
(b) State the significance of sieve analysis in brief.	04
(c) Identify the gravity separation process by which Coal washing is done? Explain with diagram.	07
OR	
Q.4 (a) Describe the working principle of concentration table with suitable diagram.	03
(b) State the purpose of collectors, frothers and activators in flotation process	04
(c) Ellobrate the principle forth flotation. Cell. Explain the froth flotation with diagram.	07

- Q.5** (a) What is role of Mineral processing in Extractive Metallurgy? Discuss. **03**
(b) Draw simplified beneficiation flow sheets of Bituminous coal. **04**
(c) Discuss about electrostatic separators. **07**
- OR**
- Q.5** (a) Classify different types of industrial screening. **03**
(b) Draw beneficiation flow sheets of magnetite ore. **04**
(c) Discuss briefly about Magnetic Separation **07**
