

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - III EXAMINATION - WINTER 2025

Subject Code: BE03022011

Date: 15-12-2025

Subject Name: Introduction to Mining

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) Define mining and list three major mineral commodities extracted globally	03
(b) Differentiate between Surface Mining and Underground Mining based on the depth of the deposit and capital cost required.	04
(c) Analyze the major social impacts that a new, large-scale mining project could have on surrounding communities.	07
Q.2 (a) List three core principles of Sustainable Development that are relevant to the mining industry.	03
(b) Explain why the mining industry is considered a primary economic activity and describe its importance to modern technological society.	04
(c) Describe the sequential steps and equipment involved in the cycle of operations for a typical large open-pit mine.	07
OR	
(c) Analyze the potential effect of mining activity on the surface water hydrology in the region immediately surrounding the mine site.	07
Q.3 (a) Define Environmental Impact Assessment. List its three main phases.	03
(b) Explain the main differences between Ore and Mineral in the context of mining.	04
(c) Apply the criteria for method selection to explain why the Longwall Mining method would be chosen over the Room and Pillar method for a deep, thin, and uniform coal seam.	07
OR	
(a) List three United Nations Sustainable Development Goals that the mining sector has a direct responsibility to address.	03
(b) Apply the concept of land-use change to describe the major visual impact of an open-cast quarrying operation on the local landscape.	04
(c) Describe the entire process of Mineral Prospecting and Exploration, detailing the sequential stages from desk study to feasibility report.	07

- Q.4 (a)** List three key geological or technical factors that influence the choice between Open Pit and Underground Mining. **03**
- (b)** Justify the necessity of creating a comprehensive Mine Closure and Reclamation Plan as an essential part of responsible mining. **04**
- (c)** Explain the fundamental difference in the formation, occurrence, and extraction of Metallic Deposits versus Non-Metallic Deposits. Give one example of each. **07**

OR

- (a)** State three potential sources of air pollution from a typical surface coal mining operation. **03**
- (b)** Explain the geological and economic conditions under which Placer Mining is typically employed, and give one example of a commodity extracted this way. **04**
- (c)** Evaluate the economic trade-offs faced by a mining company when choosing between maximizing short-term profits and investing in expensive, long-term environmental control measures for sustainability. **07**
- Q.5 (a)** Define Resettlement and Rehabilitation in the context of a mining project. **03**
- (b)** Analyze the concept of 'economic depletion' in mineral resources and describe the two main strategies a mining company can use to counter it. **04**
- (c)** Describe the general methodology, applicability conditions, and primary advantages of the Block Caving mining method. **07**

OR

- (a)** List three key terms used to define the location of a mineral deposit. **03**
- (b)** Apply knowledge of cleaner technology to describe two innovations that promote sustainable and cleaner mining practices. **04**
- (c)** Explain the different stages of a mine's life cycle from prospecting to closure, detailing the main activity and goal of each stage. **07**
