

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3172216****Date:01-12-2023****Subject Name: Rock Excavation Technology****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**

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|------------|---|-----------|
| <b>Q.1</b> | (a) Write the scope and importance of rock excavation technology in mining.                             | <b>03</b> |
|            | (b) Explain different types of underground excavations.   | <b>04</b> |
|            | (c) Write a note on constructional features and working of continuous surface miner.                    | <b>07</b> |
| <b>Q.2</b> | (a) List out the steps involved in rock excavation.   | <b>03</b> |
|            | (b) Classify the surface excavating equipment systems.  | <b>04</b> |
|            | (c) Discuss the physico-mechanical properties of rocks considered while selecting an excavation method. | <b>07</b> |
| <b>OR</b>  |   |           |
|            | (c) Write a brief note on Bucket Wheel Excavator used in surface excavation.                            | <b>07</b> |
| <b>Q.3</b> | (a) List out the factors considered for selecting an explosive for rock excavation.                     | <b>03</b> |
|            | (b) Compare primary, secondary and tertiary process of rock breaking.                                   | <b>04</b> |
|            | (c) Explain the safety provisions made in a mine while blasting.  | <b>07</b> |
| <b>OR</b>  |   |           |
| <b>Q.3</b> | (a) List out different types of machineries used in underground excavation.                             | <b>03</b> |
|            | (b) Compare tunnel and cavern in detail.  | <b>04</b> |
|            | (c) Explain planning and site -investigation for tunneling.   | <b>07</b> |
| <b>Q.4</b> | (a) Write the procedure for evaluation of blast performance   | <b>03</b> |
|            | (b) Explain the working principle of ultrasonic instruments.  | <b>04</b> |
|            | (c) Explain non-destructive instruments used for excavations.   | <b>07</b> |
| <b>OR</b>  |   |           |
| <b>Q.4</b> | (a) Define contour blasting.  | <b>03</b> |
|            | (b) Explain under water drilling and blasting.  | <b>04</b> |
|            | (c) Explain the parameters considered for the evaluation of blasting.                                   | <b>07</b> |
| <b>Q.5</b> | (a) Write the selection criteria for cutting tools used for underground excavation                      | <b>03</b> |
|            | (b) Explain the parameters influencing location of a tunnel and its design.                             | <b>04</b> |
|            | (c) Explain the process of borehole logging and data interpretation.                                    | <b>07</b> |
| <b>OR</b>  |   |           |
| <b>Q.5</b> | (a) List the instruments used for convergence monitoring  | <b>03</b> |
|            | (b) Write a note on constructional features of tunnel boring machine (TBM).                             | <b>04</b> |
|            | (c) Explain the excavation of caverns for hydroelectric projects.                                       | <b>07</b> |

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