

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) EXAMINATION – WINTER 2022****Subject Code:3160613****Date:16-12-2022****Subject Name:Rock Mechanics and Tunneling****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) Explain the following terms: (1) Rock Material (2) Intact Rock (3) Rock mass	03
(b) List the Tunneling methods in all types of rock masses.	04
(c) Define rock mechanics. What is its importance for a civil engineering?	07
 Q.2 (a) What is the bearing capacity of rock?	03
(b) Give a brief note on Safety precautions in tunneling	04
(c) Discuss geological classification of rocks. Give at least three examples of each type of rock.	07
OR	
(c) What is the necessity of ventilation and dust control in tunneling? Explain with sketches their methods	07
 Q.3 (a) Under which situations tunnels are preferred.?	03
(b) Explain the various types of supports used in tunnels.	04
(c) Explain the Influence of geological aspects on construction of tunnels.	07
OR	
Q.3 (a) What is rock stability?	03
(b) How do you calculate safe bearing capacity in Rock?	04
(c) What are different index properties of rocks? How would you determine them? What is their importance?	07
 Q.4 (a) Write short notes on Shear strength of rocks	03
(b) Explain with neat sketch commonly adopted shape of tunnels.	04
(c) What are different modes of failure of rocks? Give one example of each.	07
OR	
Q.4 (a) Give a brief note on Tunnel ventilation	03
(b) Explain Causes of slope failure in rock.	04
(c) Explain various laboratory tests for the determination of the strength of rocks.	07
 Q.5 (a) What is the importance of shafts in tunneling?	03
(b) Describe with sketches various operations involved in construction of shafts	04
(c) Explain the following terms: (1) Shotcreting , (2) Rock Bolting, (3) Anchoring (4) Reinforcement of laminated rock	07
OR	
Q.5 (a) Write short notes on Hardness of rock.	03
(b) Describe the rock quality designation (RQD)	04

- (c) Enlist various methods adopted for tunneling in rocks. Explain with sketch any one method. **07**
