

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160613****Date:08/06/2022****Subject Name:Rock Mechanics and Tunneling****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**

<b>Q.1</b>	(a) Explain rock failure in tri-axial compression.	<b>03</b>
	(b) Explain deformability and hardness of rock.	<b>04</b>
	(c) List out and explain physical properties of rock.	<b>07</b>
<b>Q.2</b>	(a) Explain objectives of rock exploration.	<b>03</b>
	(b) Explain the need of tunnel and its disadvantage.	<b>04</b>
	(c) Explain importance of Rock Mechanics.	<b>07</b>
	<b>OR</b>	
	(c) Why drainage is necessary in tunnel? Discuss various drainage systems for tunnel.	<b>07</b>
<b>Q.3</b>	(a) Write advantages of rock testing.	<b>03</b>
	(b) Differentiate between material and mass form of rocks.	<b>04</b>
	(c) Explain porosity & permeability of rocks.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) Explain effects of discontinuities on rock structure.	<b>03</b>
	(b) Explain significance of shaft and portals in tunnel.	<b>04</b>
	(c) What is drift? Explain various types of drifts used for tunneling in rock with neat sketches.	<b>07</b>
<b>Q.4</b>	(a) Explain swelling and anisotropy of rocks.	<b>03</b>
	(b) Write a short note on Mechanical Ventilation in Tunneling.	<b>04</b>
	(c) State engineering classification of rock mass.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Draw sketch of different shapes of tunnel.	<b>03</b>
	(b) Explain mechanical properties of rock.	<b>04</b>
	(c) Explain rock boring and rock logging.	<b>07</b>
<b>Q.5</b>	(a) Write safety precautions in tunnel constructions.	<b>03</b>
	(b) Write short note on rock specimen shapes.	<b>04</b>
	(c) Define Rock mechanics & explain its importance.	<b>07</b>
	<b>OR</b>	
<b>Q.5</b>	(a) What are the causes of accidents in tunnel?	<b>03</b>
	(b) Explain swelling & anisotropy of rocks.	<b>04</b>
	(c) Enlist the various methods of tunneling in hard rock, explain step wise procedure of any one by drawing sketch.	<b>07</b>

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