Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2021

Subject Code:3142209 Date:04/01/2022

Subject Name:Rock Mechanics

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)**	How is the Rock Mechanics helpful to the Mining Engineering?	**03**
	(b)	List out the different methods used to measure the physio-mechanical properties of the rock.	**04**
	(c)	Explain the elasticity, plasticity and Poisson's ratio.	**07**
Q.2	**(a)**	In a point load test on 50 mm diameter core specimen rupture was observed at a load of 6000 kg. Find out the point load strength of the specimen?	**03**
	(b)	What is the difference between intact rock and rockmass?	**04**
	(c)	What is tensile strength? Explain an indirect method of to measure it.	**07**
		OR	
	(c)	What is shear strength? Explain shear box test with a neat sketch.	**07**
Q.3	**(a)**	What is creep?	**03**
	(b)	How to measure the creep?	**04**
	(c)	What is rheology? Explain any one rheological models.	**07**
		OR	
Q.3	**(a)**	Which are the factors influencing wave velocity?	**03**
	(b)	Explain Young's modulus and Modulus of Rigidity.	**04**
	(c)	Explain the types of waves in dynamic properties of rock.	**07**
Q.4	**(a)**	In a 150 cm rock core run, the following places were core recovered from a borehole: 5.3, 10.8, 12.5, 7.5, 14.8, 32.0, 6.8, 14.5, 3.5 and 13.4 cm. Find the RQD in percentage.	**03**
	(b)	Write a short note mechanics of rock failure	**04**
	(c)	Describe failure modes in rocks with neat sketch.	**07**
		OR	
Q.4	**(a)**	Explain : Porosity	**03**
	(b)	Write a short note on Hoek and Brown criterion.	**04**
	(c)	Explain Mohr-coulomb criterion of rock failure.	**07**
Q.5	**(a)**	Explain in brief: RMR	**03**
	(b)	Explain: Forces and displacement in cable bolting	**04**
	(c)	What is RQD? Explain any once RQD system.	**07**
		OR	
Q.5	**(a)**	How to do the roof testing?	**03**
	(b)	Explain: cable bolting	**04**
	(c)	Write in detail the theory of reinforcement of rock mass by rock bolting.	**07**

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