Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2018

Subject Code:2152204 **Date:16/11/2018**

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.**

			MARKS
Q.1	**(a)**	What do you understand by engineering rock mechanics & its application in mining?	**03**
	(b)	With the help of neat diagram, explain stress-strain curve.	**04**
	(c)	Describe briefly about the different tests to determine the Permeability of rock sample.	**07**
Q.2	**(a)**	Write the name of different physical properties of rock. Why knowledge of these properties is important for a mining engineer?	**03**
	(b)	A rock sample has bulk density of 2.85 gm/cc. Its moisture content was found to be 1.40 %. Find out its dry density.	**04**
	(c)	Briefly explain "Compressive strength of rock".	**07**
		OR	
	(c)	What are the methods of determining of shear strength of rock? Describe about any one method in detail.	**07**
Q.3	**(a)**	What is meant by hardness of rocks? Also write the mohr's scale of hardness.	**03**
	(b)	A rock specimen had moisture content of 2.25 %.Volume of solids was found to be 85 % find out the degree of saturation of rock sample.	**04**
	(c)	Discuss the factors influencing velocity of waves through a rock mass?	**07**
		OR	
Q.3	**(a)**	What do you mean by durability of rock or rockmass?	**03**
	(b)	Explain Porosity, density and moisture content of rock.	**04**
	(c)	Explain briefly about rheology & rheological models.	**07**
Q.4	**(a)**	Discuss about the effect of joints and fracture on mechanical properties of rocks.	**03**
	(b)	Briefly describe about the creep behaviour of rock.	**04**
	(c)	Discuss the Griffith's theory of fracture in rock mass.	**07**
		OR	
Q.4	**(a)**	Define Modulus of elasticity and Poisson's ratio.	**03**
	(b)	A sample of diameter 50 mm and thickness 25 mm was tested by Brazilian test. If failure occurs at a load of 1964.28 kg, determine the tensile strength in kg/cm^2.	**04**
	(c)	What do you understand by pre-mining state of stress? Explain hydraulic fracturing method in detail.	**07**
Q.5	**(a)**	Discuss the necessity and requirements of "in-situ" tests.	**03**
	(b)	Define failure in rocks. Explain different types of failure in rock.	**04**
	(c)	Two rock samples of 50 mm diameter were subjected to point load test. The rupture was observed at a load of 500 kg and 600 kg respectively. Find out the point load strength in kg/cm^2.of both sample and calculate the unconfined compressive strength of each sample.	**07**
		OR	
Q.5	**(a)**	Discuss Idealy Plastic, perfectly Plastic and Elastic Plastic materials.	**03**
	(b)	Discuss Mohr's and Coulomb theory of rock failure.	**04**
	(c)	What are the different physical properties of soil? Explain briefly.	**07**

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