GUJARAT TECHNOLOGICAL UNIVERSITY BE – SEMESTER V • EXAMINATION – WINTER - 2012

Subject code: 152203

Subject Name: Rock Mechanics

Time: 02:30 pm to 05:00 pm

Date: 17-01-2013

Instructions:

Total Marks: 70

- 1. Attempt all questions. 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- (a) What is rock mechanics? Give the applications and 07 **Q.1** limitations of rock mechanics.
 - (b) Which are the responsible factors for mechanical properties 07 of rock masses? Write a note on elasticity and plasticity of rocks.
- **Q.2** (a) Explain electrical, thermal and swelling properties of 07 rocks.
 - (b) Write a note on radial and longitudinal test for the 07 measurement of permeability in rock masses.

OR

- (b) Explain fault and fold as a defects in rock masses. 07
- Q.3 (a) Give the stress analysis in isotopic rocks under dynamic 07 loading.
 - 07 (b) Explain ground water flow in rock mass.

OR

- Q.3 (a) Determine the hydro-fracturing in rocks in pre-mining state 07 of stress.
 - (b) Give the instruments used for measurement of water 07 measurement.

07 **Q.4** (a) What is rheology? Explain Kelvin model.

(b) Explain Griffith criteria of fracture initiation in rock 07 masses.

OR

- (a) What is creep? Give the measurement of creep in rocks. 0.4 07 (b) Explain kinds of failure in different material. Give the 07 conclusion on strength and failure criteria.
- (a) Which factors are influenced wave velocities? Add a note 07 Q.5 on static and dynamic modulii of elasticity.
 - (b) Write a note on flat-jack test for measurement of strength 07 of rocks.

OR

(a) Give the consolidation and compaction properties of soil. 07 Q.5 (b) Classify the soils on the basis of consistency. 07
