

# CBCS SCHEME

USN

15MN64

## Sixth Semester B.E. Degree Examination, June/July 2019 Rock Mechanics

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain the various applications of Rock Mechanics in engineering field. (08 Marks)
- b. Define discontinuity in rocks. Mention ten parameter used to describe discontinuity in rocks. (08 Marks)

OR

- 2 a. Write short notes on mapping and hemispherical projections. (08 Marks)
- b. Explain how to determine the strength of the jointed rock mass using Barton's method. (08 Marks)

### Module-2

- 3 a. A two dimensional stress element is subjected to the following: (08 Marks)

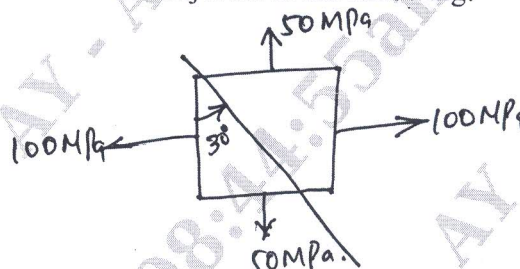


Fig.Q.3(a)

Determine the resultant stress along the inclined plane both in magnitude and direction.

- b. In a two dimensional stress element as shown, determine the principal stresses and their planes. (08 Marks)

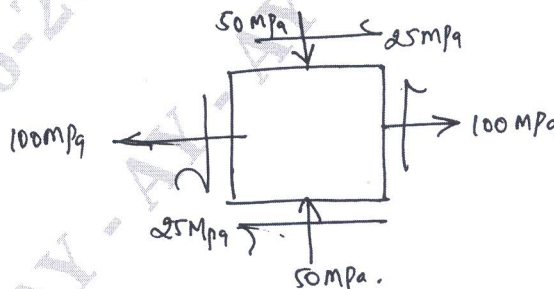


Fig.Q.3(b)

OR

- 4 a. Define plain strain problem and explain it with an example. (08 Marks)
- b. Explain with a neat sketch the Mohr's circle of strains. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**Module-3**

- 5 a. Explain in detail the importance of specific gravity and hardness in rock mechanics study. (08 Marks)  
b. Explain the difference between tensile strength and shear strength of rocks in underground excavation. (08 Marks)

**OR**

- 6 a. Explain in detail the creep phenomenon with respect to underground excavation. (08 Marks)  
b. Define the term RQD and explain in detail the method of determination of it. (08 Marks)

**Module-4**

- 7 a. Explain in detail with neat sketches the plate load test to determine the in-situ strength of rock mass. (08 Marks)  
b. Explain in detail with neat sketches to determine the insitu-internal stresses in rock mass. (08 Marks)

**OR**

- 8 a. Explain in detail the method of determination of strength of rock using Coulomb's criterion. (08 Marks)  
b. Explain in detail the Mohr's rock failure criteria. (08 Marks)

**Module-5**

- 9 a. Name the simple rheological models and explain them in details with sketches. (08 Marks)  
b. Explain in detail with neat sketches the Kelvin rheological model. (08 Marks)

**OR**

- 10 a. Explain in detail the method of determination of static Young modulus of elasticity of rock. (08 Marks)  
b. Explain in detail the method of determination of dynamic Young modulus of elasticity of rock. (08 Marks)

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