

# CBCS SCHEME



18MN55

## Fifth Semester B.E. Degree Examination, Feb./Mar.2022

### Rock Mechanics

Time: 3 hrs.

Max. Marks: 100

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

#### Module-1

- 1 a. Explain the scope and applications of rock mechanics in mining engineering. (10 Marks)  
b. Explain the procedure of plotting hemispherical projection of discontinuities. (10 Marks)

OR

- 2 a. Explain details of discontinuities and describe its effects on mining. (10 Marks)  
b. Discuss details of Barton's shear strength of joints. (10 Marks)

#### Module-2

- 3 a. Define stress in rocks and explain Mohr's circle of stress procedure. (10 Marks)  
b. (i) Calculate the vertical stress at a depth of 8 M at a location where 5-m bed of sandstone with a unit weight of 25.1 kN/m<sup>3</sup> overlies a thick shale unit weight of 27.5 kN/m<sup>3</sup>. (05 Marks)  
(ii) Discuss stress-strain relationship of different rocks. (05 Marks)

OR

- 4 a. Explain the elasto plastic behavior of rocks. (10 Marks)  
b. Discuss Mohr's circle of strain. (10 Marks)

#### Module-3

- 5 a. Discuss the creep deformation and its strength behavior over time with a neat diagram. (10 Marks)  
b. Explain abrasivity and mode of determination of abrasivity in laboratory (Chechar test). (10 Marks)

OR

- 6 a. Explain Strength indices. (10 Marks)  
b. Explain rheological models with neat diagram. (10 Marks)

#### Module-4

- 7 a. Explain plate loading test with proper pictorial representation. (10 Marks)  
b. Explain the method of determination of in-situ bearing strength of rock mass. (10 Marks)

OR

- 8 a. Explain and discuss the procedure of flat jacketing test. (10 Marks)  
b. Discuss Bore hole Tests with neat sketch. (10 Marks)

#### Module-5

- 9 a. Discuss the different theories of rock failure. (10 Marks)  
b. Describe the method of determination of static elastic constants of a rock. (10 Marks)

OR

- 10 a. Describe Griffith criteria of rock failure. (10 Marks)  
b. Explain different elastic constants of rocks. (10 Marks)

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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.