18MN55

CBCS SCHEME

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
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, importance and application of Rock Mechanics in mining industry. **(10 Marks)**

    b. Explain the different discontinuities in rock and its effect on Rock behaviour with suitable diagram. **(10 Marks)**

OR

2   a. Write short note on hemispherical projection of joints/ discontinuities and its uses. **(10 Marks)**

    b. Write a note on Barton's shear strength of joints. **(10 Marks)**

Module-2

3   a. Explain how to construct Mohr's circle of stress with a neat sketch. **(10 Marks)**

    b. Draw a free body diagram and explain the differential equations of equilibrium. **(10 Marks)**

OR

4   a. Explain stress in a plane (two dimensional strain) and how it is useful in rock mechanics. **(10 Marks)**

    b. Explain the stress-strain curves of various rocks. **(10 Marks)**

Module-3

5   a. Write short note on:
       a) Hardness/Durability
       b) Permeability
       c) Porosity of rock **(10 Marks)**

    b. Explain Abrasivity of rock and how it is determined in laboratory. **(10 Marks)**

OR

6   a. Explain and elaborate on the principle of Creep deformation. With suitable diagram. **(10 Marks)**

    b. Write a short note on Creep test and rheological models. **(10 Marks)**

Module-4

7   a. Explain with a neat diagram conduction and evaluation of Insitu shear tests of rock mass. **(10 Marks)**

    b. Explain with a neat diagram conduction and evaluation of In-situ bearing tests of rock mass. **(10 Marks)**

OR

8   a. Explain with a neat diagram the plate loading test for in-situ rock mass. **(10 Marks)**

    b. Explain with a neat diagram the Bore hole jack test for in-situ rock mass mention their advantages. **(10 Marks)**

Module-5

9   a. Explain the important elastic constants of rock with neat sketches. **(10 Marks)**

    b. Name the theories of rock failure and explain any one theory of rock failure in detail. **(10 Marks)**

OR

10   a. Explain Mohr-Coulomb's Criteria for rock and rock mass. **(10 Marks)**

     b. Explain Griffith's failure Criteria for rock and rock mass. **(10 Marks)**

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