18MN55

USN

Fifth Semester B.E. Degree Examination, July/August 2021
Rock Mechanics

Time: 3 hrs.   Max. Marks: 100

Note: *Answer any FIVE full questions.*

1   a.   Define Rock mechanics. List the slope and importance of Rock mechanics.   **(10 Marks)**
     b.   Explain the various kinds of Discontinuities affecting the Rock mass.   **(10 Marks)**

2   a.   Explain the various developments and the applications of Rock mechanics in mining.
                                                                                        (10 Marks)
     b.   With a sketch explain the procedure for mapping and hemispherical projection of discontinuities.   **(10 Marks)**

3   a.   With an example explain analysis of stress in a two dimensional plane.   **(10 Marks)**
     b.   With a sketch explain the procedure for construction of Mohr's circle of stress direction.   **(10 Marks)**

4   a.   Illustrate stress-strain relationship of different rocks.   **(10 Marks)**
     b.   Explain the elasto-plastic behavior of rocks.   **(10 Marks)**

5   a.   With a neat sketch, explain the determination of uniaxial compressive strength of a rock in laboratory.   **(10 Marks)**
     b.   Explain the procedure to determine the abrasivity of rock in laboratory.   **(10 Marks)**

6   a.   Explain creep deformation and its strength behavior in rocks.   **(10 Marks)**
     b.   With a sketch explain the various rheological models in rocks.   **(10 Marks)**

7   a.   With a neat sketch, explain the procedure to determine insitu deformability test using plate loading test.   **(10 Marks)**
     b.   Explain the process of determination of strength using plate Jacking test.   **(10 Marks)**

8   a.   With a neat sketch, explain the Borehole Jack test.   **(10 Marks)**
     b.   Explain the determination of insitu bearing strength of rockmass.   **(10 Marks)**

9   a.   Explain the Dynamic properties of rock and rockmass.   **(10 Marks)**
     b.   Explain the Coulomb's theory of rock failure.   **(10 Marks)**

10   a.   Explain Mohr's and Griffith criteria of rock failure.   **(10 Marks)**
     b.   Explain the empirical criteria of rock failure.   **(10 Marks)**

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