

M. E. CIVIL ENGINEERING FIRST YEAR FIRST SEMESTER EXAM –2025
ROCK MECHANICS AND TUNNELING

TIME: Three Hours

FULL MARKS: 100

Answer all the questions
Assume any data if needed, reasonably

1. (a) Discuss the geological cycle of rock formation. (5)
(b) State the rock classification based on formation with an example. (5)
(c) Differentiate between Intact rock and rock mass. (5)
(d) Define the term 'strike', 'dip', and 'dip direction'. (5)
(e) Write a short note on stereographic projection. (10)

2. (a) Explain different types of point load test. With neat sketch show the specimen shapes and loading direction. (10)
(b) What is slake durability index? Briefly explain the procedure of determining the slake durability index. (10)
(c) A sandstone core has 82 mm diameter and 169 mm length. On saturation in water its wet weight is 21.42 N, after oven drying its weight is 20.31 N. Calculate its wet unit weight, dry unit weight, and porosity. (10)

3. (a) As per ISRM what are the important parameters for the quantitative description of discontinuities in rock mass. Briefly describe each parameter. (10)
(b) Define Block Size Index, Volumetric Joint Count, RQD and Core Recovery Ratio. (5)
(c) A rock mass consists of four joint sets. The joint counts are normal to each set as 12 per 10 m for joint set 1, 9 per 6 m for joint set 2, 8 per 10 m for joint set 3, 7 per 5 m for joint set 4. Find Block Size Index, Volumetric Joint Count, and RQD. (10)
(d) Write the name of four important classification system of rock. Describe any one method of rock classification in detail except RQD. (15)