

End Semester /Reappear (Semester VI) Examination May 2025

Programme: Diploma (MiE)

Course: Rock Mechanics

Course Code: 8D.354

Enrolment no. _____

Full Marks: 70

Time: 3 Hrs.

Section I

1. Short Answer type questions. Answer any four.

4 x 5 = 20

- a. What is Poisson's ratio? A body experiences lateral strain of **0.25** and longitudinal strain of **0.60**. Determine the Poisson's ratio for this material.
- b. Define Strength. Compare between compressive and tensile strength of rock.
- c. Enlist the methods of measuring In-situ stresses and induced stresses in rock mass.
- d. List out the geological and operational causes that contribute to the occurrence of rock bursts in underground mining.
- e. Discuss the type of supports used in underground mining.
- f. Define the following
 - i. Rock Mechanics
 - ii. Rock mass
 - iii. Intact Rock
 - iv. Homogeneous rock

Section II

Long Answer type questions. Answer any three.

3 x 10 = 30

2. How is anchorage testing conducted for roof bolts? Explain the procedure involved and discuss its importance in ensuring structural stability and safety.
3. Classify the tensile strength of rock mass and explain the methods used for its determination, including both direct and indirect techniques.
4. Name and explain commonly used laboratory methods for determining the Uniaxial Compressive Strength (UCS) of a rock mass.
5. What is RMR classification? What are the different parameters of Beniaowski's RMR classification explain with its formula?
6. What are the different techniques used to assess the shear strength of rock masses? Provide a concise explanation of each method, along with their practical applications in geological and engineering contexts.

Section III

Application based questions. Answer any one.

1 x 20 = 20

7. In an underground rock sample find out the indirect method of determination of tensile strength of the specimen in Brazilian test and write its precautions.
8. Summarize the practice for roof bolting in underground mines as per DGMS guidelines.
9. During a prospecting survey, a core sample measuring 1.5 meters in length is collected. The core is divided into segments of 10 cm, 8 cm, 6 cm, 14 cm, 22 cm, 19 cm, 3 cm, 4 cm, 16 cm, 13 cm, 6 cm, and 9 cm. Determine the Rock Quality Designation (RQD) of the specimen.
