

**PRACTICE SET**

**End Semester Examination, Spring- 2026**

**Program: DIPLOMA (MINING)**

**Semester: VI**

**Subject: ROCK MECHANICS**

**Subject Code: 8D.353**

**UNIT I**

(10 Marks)

1. Define rock mechanics? Describe the application of rock mechanics
2. Discuss the relationship between lateral & longitudinal stress?
3. Briefly describe residual stresses and induced stresses?
4. Define the following
  - a. Stress & Strain
  - b. Relation between young modulus  $E$  & Rigidity Modulus  $G$
  - c. Poison ratio
  - d. Bulk modulus
  - e. Young's modulus
5. What are the various applications of Rock mechanics? Write about salient points of Geophysical prospecting
6. Write Brief notes on followings:
  - a) RQD
  - b) RMR Classification
  - c) Stress & Strain
  - d) Hardness

(20 Marks)

7. A rock core of total length 1.2 m was obtained during a prospecting operation. The recovered core pieces have the following lengths:  
12 cm, 8 cm, 5 cm, 16 cm, 21 cm, 18 cm, 2 cm, 3 cm, 16 cm, 11 cm, 5 cm, and 7 cm.  
Calculate the Rock Quality Designation (RQD) for the given core sample.
8. What is RMR classification? What are the different parameters of Beniaowski's RMR classification explain with its formula?

UNIT II  
Section II (10 Marks)

1. Define rock strength properties and explain compressive, tensile, shear,
2. Describe the Point Load Strength Index test and its significance in rock mechanics.
3. Enlist the mechanical properties of rock mass and explain one of them in detail.
4. Describe various methods used for measuring in-situ stresses and induced stresses in rock mass.
5. Describe porosity, density, and moisture content of rocks and their engineering significance.
6. Discuss the factors affecting creep behavior in rocks and write about concept of deformation in rock mass and its types.
7. Explain the flat jack method for determining in-situ stress with a neat diagram.

Section III (20 Marks)

8. During a Brazilian Test of a cylindrical rock core of 54 mm dia and 22 mm thickness, failure occurred at diametrical loading of 11.4 kN . the tensile strength of rock in MPa will be.
9. Describe the measurement of a site investigation are as follows  
 $J_n = 9$ ,  $J_r = 1.5$ ,  $J_a = 2.0$ ,  $J_w = 1.0$ ,  $SRF = 2.5$ . The RQD values taken from five boreholes of the area are 94.2, 95.6, 99.4, 95.3, & 98.0 respectively .The rock mass quality index is

UNIT III

(10 Marks)

1. Explain the triaxial compression test and its significance in rock mechanics..
2. What steps can be taken to reduce or prevent coal bumps in underground coal mines?
3. Discuss the punch shear test and its application in determining shear strength of rock.
4. Describe the Point load strength index in rock mass explain in brief.
5. Name and explain commonly used laboratory methods for determining the Uniaxial Compressive Strength (UCS) of a rock mass.
6. Explain the Protodyakonov strength index and describe the Brazilian test for measuring tensile strength of rock and state its advantages.

III (20 Marks)

7. Discuss the factors influencing the occurrence of rock bumps and explain various control measures to prevent rock bursts and bumps.

UNIT IV

(10 Marks)

1. Discuss the type of supports used in underground mining.
2. Explain bolting and stitching with its advantages.
3. What is anchorage testing of roof bolts? Describe the procedure and its significance.
4. Describe the concept and application of cable bolting in underground excavations.

5. Describe Grouted roof bolts and Resin roof bolts, including their advantages and limitations.
6. Classify and explain about the roof bolting with its applicable conditions.

Section III (20 Marks)

7. Discuss the anchorage testing of roof bolts and its importance in ground control
8. Explain the Dome (Arch) Theory of strata behavior with neat sketches and its practical significance in underground excavations.

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<p><b><u>Disclaimer:</u></b> - This is a Practice set. The Question in End term examination will differ from the Practice set. This Practice set is meant for practice only.</p>
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