

PRACTICE SET
End Semester Examination, Spring- 2026

Course: APPLIED ROCK MECHANICS
Course Code: 8PCCMiE309
Semester: VI
Program: BTECH

Course Outcomes	Description
CO1	Sketch of strata control for understanding, formulating and solving strata control problem in any underground mine.
CO2	Analyze and solve strata movement problems.
CO3	Acquire knowledge and hands-on competence in applying the concepts in the development of strata control.
CO4	Describe subsidence & develop in depth knowledge of monitoring prediction & control.

UNIT I

Section B (Each carries 10 marks)

1. Give your views in briefly about Geological Strength Index. Formulate the Rock mass quality with reference to GSI value? **CO1 Analyse**
2. What is Rock Mass Rating (RMR)? Elucidate the different factors associated with Bieniawski's RMR classification. **CO1 Apply**

Section C (Each carries 20 marks)

3. Suppose you are given the task of making the tunnel which will go through different types of rocks so how will you assess the characteristics of the rocks and how it will help you for selection and design of support give your answer by considering your own assumption. **CO1 Apply**
4. Explain the Coal Mine Roof Rating (CMRR) and elaborate the mechanism with suitable diagram various parameters which is very crucial to calculate CMRR? **CO1 Apply**

UNIT II

Section B (Each carries 10 marks)

5. Differentiate between Mechanically anchored rock bolts and friction anchored rock bolts **-CO2 Analyze**
6. Illustrate the grouted rock bolts also explain it with schematic reaction curve indicating axial load and shear load applied. **REMEMBER CO2**
7. Discuss the different types of slope failure with their mechanism failure. **-CO2 Remember**
8. Explain the Mohr's Circle of strain in two dimension **-CO2 Create**

Section C (Each carries 20 marks)

9. Formulate the methodology to calculate factor of safety for the wedge failure? –
CO2 Create
10. The components of state of stress at a point in x-y plane are given as $\sigma_{xx} = 40\text{MPa}$, $\sigma_{yy} = 20\text{Mpa}$ and $\tau_{xy} = 15\text{MPa}$. Calculate the major and minor principle stresses acting on the x-y plane in Mpa? – **CO2 Evaluate**

UNIT III

Section B (Each carries 10 marks)

11. Explain the Artificial support and illustrate Active and passive support with suitable examples. –**CO3 Apply**
12. Explain the following with reference to the support system in underground mines :-
a. Wire Mesh
b. W - Strap –**CO3 Remember**
13. Prepare the mechanism developed for the gunite and shotcrete. –**CO3 Create**

Section C (Each carries 20 marks)

14. Describe different types of support system used in underground mine? –**CO3 Analyze**
15. A Circular tunnel of radius 3m is constructed in a hydrostatic stress field of 15 MPa. The modulus of elasticity and Poisson's ratio of the rock are 10 GPa and 0.25 respectively. A uniform support pressure P_i is applied to the tunnel boundary to restrict the radial deformation at the tunnel boundary to 4mm. Evaluate the value of P_i . **CO3 Evaluate**

UNIT IV

Section A (Each carries 5 marks)

16. Draw the diagram of subsidence profile and show all the related elements with proper labelled diagram? –**CO4 Remember**
17. Describe different types of support system used in underground mine? –**CO3 Analyze**
18. Elaborate the mine subsidence. What are the causes other than mining that affect subsidence? –**CO3 Understand**
19. Local and main fall are concerned with subsidence so what do you think about such types of strata fall? –**CO4 Understand**
20. Explain the Sinkhole Subsidence with suitable diagram?. –**CO4 Remember**

Section B (Each carries 10 marks)

21. Elaborate the factors which effect the subsidence of the ground also explain the damages due to subsidence with neat and clean diagram. **CO4 Analyze**
22. Discuss about the props. Describe different types of props being used in underground mines. **CO4 Understand**
23. Explain the subsidence also elaborate and provide a clear picture of critical subsidence, subcritical subsidence and supercritical subsidence. –**CO4 Evaluate**

Section C (Each carries 20 marks)

24. A 2.5m thick coal seam lying at an average depth of 100m has been developed by bord and pillar method. The width of the square pillar is 30m Centre to centre and the gallery width is 4m. The average density of the overlying strata is 26 kN/m^3 and the pillar strength is 4500 kN/m^2 . Calculate factor of safety and extraction ratio during development of the pillar. –**CO4 Evaluate**

**Summary Sheet:
CO Wise**

CO	Q. No	Marks
CO1	5, 6, 7, 8, 9, 10, 11, 12	100
CO2	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	130
CO3	27, 28, 29, 30, 31, 32, 33, 34, 35	105
CO4	28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45	90
Total		425

Unit Wise

Unit	Q. No	Marks
Unit 1	5, 6, 7, 8, 9, 10, 11, 12	100
Unit 2	13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26	130
Unit 3	27, 28, 29, 30, 31, 32, 33, 34, 35	105
Unit 4	28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45	90
Total		425

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No	Marks
LOT	7, 8, 13, 16, 17, 19, 22, 23, 30, 32, 38, 5, 6, 14, 15, 18, 20, 27, 28, 29, 37, 40	110
HOT	8, 10, 11, 12, 21, 31, 9, 25, 34, 39, 26, 35, 41, 42,24,33	250
Total		425

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Disclaimer: - This is a practice set. The Question in the End term examination will differ from the practice set. This practice set is meant for practice only.
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