JHARKHAND Rai University RANCHI

PRACTICE SET
End Semester Examination, December, 2025

Program: B. Tech
Semester: V
Subject: UNDERGROUND COAL MINING
Subject Code: 8PCCMiE303

Course Outcome:
On the completion of the Course, the students will be able to:

Course Outcomes	Description
CO1	Explain the technical knowledge on development &extraction of coal by board & pillar mining.
CO2	Understand the method &problems of extraction of coal from the underground mines along with stowing.
CO3	Explain the basic knowledge of long wall mining with its applicability, components and machinery required for mining.
CO4	Apply the knowledge of various support system in mines with its advantages & applicability.

UNIT I
SECTION -A (5 Marks)

1. Compare the merits and demerits of Bord and Pillar mining with other underground coal mining methods. CO 1 (understand)
2. What are the statutory provisions related to Bord and Pillar workings? Explain their significance. CO 1 (understand)
3. Can you differentiate between semi-mechanized and mechanized schemes of Bord and Pillar development. CO 1 (Apply)
4. Discuss the operational principles and advantages of continuous miners in Bord and Pillar mining. CO 1 (Understand)

SECTION II (10 marks)

5. Analyze the factors influencing the choice of coal mining methods and justify their impact using real-world examples.CO 1 (Apply)
6. Compare and contrast Bord and Pillar mining with longwall mining and critique their respective merits in terms of recovery, safety, and mechanization. CO1(Apply)

7. Elaborate the three development methods of Bord & pillar method with a neat sketch. CO1(understand)
8. Explain the local roof fall and main roof fall after depillaring with caving in B&P working. CO 1 (understand)
9. Discuss about SDL & LHD used in Bord & Pillar mining for removal of coal. CO 1 (Understand)

Section III (20 marks)

10. In Bord and Pillar mining, how do you calculate the percentage of coal extracted during the development stage? Given: Pillar size is 40 m × 40 m (center to center), and gallery width is 4 m. Calculate the extraction percentage. CO1 (Evaluate))

UNIT II

Section A (5 marks)

11. Brief about caving & stowing method of depillaring. (CO2) (Understand)
12. Discuss the Slicing method of extraction. (CO 2) (Understand)
13. Draw sketch of diagonal & straight line of extraction in depillaring. (CO2) (Understand)
14. Describe the preparatory arrangements required before starting pillar extraction CO2 (understand)
15. Illustrate the principle of Pillar extraction method with a simple sketch.CO 2 (understand))

Section B (10 Marks)

16. State the advantages & disadvantages of panel system of B&P development method. (CO2) (Understand)
17. Sketch all types of line of extraction methods used during depillaring. (CO 2) (Apply)
18. Illustrate the diagonal and step-diagonal extraction methods used in depillaring. Use diagrams and describe how they help in roof control. CO 2 (Apply)
19. Explain the phenomenon of air blast during depillaring and suggest preventive measures. CO 2 (Apply)
20. Describe the statutory provisions regarding B&P depillaring operations as mentioned in regulation 112 of CMR- 2017. CO 2 (understand)

Section C (20 marks)

21. In depillaring the various precautionary steps are required in underground; can you describe the preparatory steps required before depillaring operations in Bord and Pillar workings in mines. CO2 (Apply)
22. In your own word can be able to escribe the precautions to be taken against fire during and after depillaring with caving in B&P working in mines. CO 2(Apply)

UNIT -III

Section I (5 marks)

23. Describe the advantages of longwall advancing method of coal mining. CO 3 (Understand)
24. What are the conditions suitable for application of long wall mining? CO 3(Understand)
25. Discuss about shearer and armoned face conveyor. CO 4 (Apply)
26. Describe in brief the retreating longwall method of coal mining. CO 3(Understand)

Section II (10 marks)

27. Describe the basic elements of longwall face layout. State the factors influencing the layout of longwall faces. (CO3) (Understand)
28. Describe the advantages and disadvantages of longwall retreating method of coal mining. (CO3) (Understand)
29. Explain the applicability conditions for using Longwall mining method with a proper labelled sketch. (CO3) (Apply)
30. Compare the advantages and disadvantages of plough and shearer. CO 3(understand)
31. Under what circumstances longwall method of mining can applicability. compare longwall advancing and retreating method . CO3(Apply)

Section III (20 marks)

32. A shearer of web depth of 0.5 m, height 1.2m speed of shearer is 0.4 km/hr at delay of 3 hrs face length of 150m is fully extracted the total panel under extraction is 400 m long. Calculate the no. of days required to cut the whole panel each day =2 shift and 1 shift =8hours. (CO3) (Evaluate)
33. Identify and classify the various types of powered supports used on a longwall face. llustrate their structural components through labeled diagrams and explain their functional significance in strata control. CO3 (Apply)

UNIT -IV

Section I (5 marks)

34. Coin the term cog and cross bar with sketch. (CO4) (Understand)
35. What is roof bolting? Draw sketch for it. (CO4) (Understand)
36. Discuss the dimension of the timber prop at various height of the gallery and draw the diagram of prop supporting the roof. (CO4) (understand)

Section II (10 marks)

37. Describe steel arches & safari support used for gallery roof support. (CO4) (understand)
38. Enumerate the types of support used in underground with proper sketch. (CO4) (Understand)
39. Compare the similarities & contrasts between hydraulic prop and friction prop. (Apply) (CO4)
40. A double ended ranging drum shearer is employed in a longwall mine of face length 150 m. The mining height is 3.5 m and depth of the web cut is 0.76 m. The cycle time for unidirectional cutting is 40 min. Considering bulk density of the coal to be 1.4 t/m^3 hourly, calculate hourly production from the face in tonne.CO 4 (Evaluate)
41. Suggest the applicability, function and principle of action of roof bolting. CO 4(Apply)

Section III (20 marks)

42. Roof bolting is a critical ground control technique in underground mining operations. Explain the various types of roof bolts used for strata support. Additionally, evaluate the key benefits and limitations associated with roof bolt systems. (CO4 – Apply)
43. Assume hydraulic prop is used as support. Describe hydraulic prop and its working principle. Also compare it with friction prop. CO 4 (apply)

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Summary Sheet

CO Wise

CO	Q. No	Marks
CO1	1,2,3,4,5,6,7,8,9,10	90
CO2	11,12,13,14,15,16,17,18,19,21	110
CO3	22,23,24,25,26,27,28,29,30,31,32	110
CO4	33,34,35,36,37,38,39,40,41,42,43	105
Total		**415**

Unit Wise

Unit	Q. No	Marks
Unit 1	1,2,3,4,5,6,7,8,9,10	90
Unit 2	11,12,13,14,15,16,17,18,19,20,21	110
Unit 3	,22,23,24,25,26,27,28,29,30,31,32	110
Unit 4	33,34,35,36,37,38,39,40,41,42,43	105
Total		**415**

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No	Marks
LOT	1,2,3,4,8,9,11,12,13,14,16,23,24,26,27,30,34,35,36,37	140
HOT	5,6,7,10,15,17,18,19,20,21,22,25,28,29,31,33,38,39,40, 42,43	275
Total		**415**

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Disclaimer: - 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.