**PRACTICE SET**
**End Semester Examination, Spring- 2026**

**Program: B.Tech (MiE)**
**Semester: IV**
**Subject: Surface Mining**
**Subject Code: 8PCCMiE206**

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

| Course Outcomes | Description |
|---|---|
| CO1 | Understand the basic concept of surface mining for understanding the applicability &slope stability problem in any opencast mine. |
| CO2 | Understand the application and operation of shovel, dragline, dozer and other opencast machinery. |
| CO3 | Understand the application, operation and limitation of bucket wheel excavator and surface transport system. |
| CO4 | Explain the applicability of the different in-pit crushing and conveying methods& interpretation of slope stability. |

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**UNIT I**
**SECTION A (10 marks)**

1. Enumerate the condition for selection of opencast mining method. CO1 (Understand)
2. Discuss the parameters of box cut and location of box cut with diagram. CO1 (Understand)
3. Discuss the bench parameters for designing of opencast mining methods? CO1 (Apply)
4. Contrast stripping ratio & break-even stripping ratio. The sale value of an ore from an open pit mine is Rs.6000 per tonne cost of mining, excluding stripping cost, is Rs.2250 per tonne. If the cost of stripping is Rs.1000 per meter cube the breakeven stripping ratio in meter cube/tone is CO1 (Evaluate)
5. Define box cut with diagrams. What are the types of box cut? Enlist the factors on which site of box cut depends. CO1 (Understand)
6. What do you mean by land reclamation? Discuss the different equipment combination adopted for land reclamation. CO1 (Understand)

**SECTION B (20 marks)**

7. If you are supposed to decide the method of mining, plan and discuss the various factors affecting selection of opencast mining method. What are the advantages and disadvantages of opencast mining? CO 1 (Analyze)

8. If you have planned to start opencast mines discuss the production process required in surface mining. Illustrate the five processes in detail with equipment required in that production process. CO 1 (Apply)

**UNIT II**

**SECTION A(10 marks)**

9. Differentiate between shovel and dragline in brief. CO2 (Understand)
10. A dragline is required to remove 3,00,000-meter cube of rock per month on the bank volume basis. Consider the following data for the dragline operation.

    Effective working hours per month = 450
    Bucket fill factor = 0.8
    Cycle time = 65 sec
    Swell factor of the rock = 1.25

    The minimum bucket capacity of the dragline in meter cube is… CO2 (Evaluate)
11. Discuss the factors to be considered while selecting an excavator. CO2 (Understand)
12. Broadly classify and explain the four types of HEMM used in opencast mining. CO2
13. Think & enumerate the factors which are considered during selection of a dragline? CO2 (Apply)

**SECTION B (20 marks)**

14. Can you classify the dragline used in opencast mining. Discuss in detail the three types of dragline used in mines. CO2 (Apply)
15. Enumerate the factors that affect the equipment selection for opencast method. Do you think is there any difference between the rope shovel and hydraulic shovel. If yes then explain. CO2 (Apply)

**UNIT III**

**SECTION A (10 marks)**

16. Discuss the applicability condition required for using Surface miner and its parts. CO3 (Understand)
17. Differentiate between manual quarrying according to [CMR2017] regulation no-105 and mechanical opencast working according to [CMR2017] regulation no-106. CO 1 (Understand)
18. Discuss about the surface miner with its three-cutting pattern. CO3 (Understand)
19. Discuss about the bucket wheel excavator with its schematic line diagram. (understand) CO3 (Apply)
20. Define – CO3 (Remember)
    (a) Swell factor
    (b) Dumping radius
    (c) Dumping Height
    (d) Cycle time
    (e) Cutting radius

**SECTION B (20 marks)**

21. Suppose that opencast coal mine is using Shovel for removal of OB/mineral. Elucidate the working, construction and types of shovels with diagram. What are the factors that affect the selection of shovel? CO3 (apply)

**UNIT IV**

**SECTION A (10 marks)**

22. A belt conveyor material of average cross-sectional area of 0.09meter square of bulk density 1.5 tonne/meter cube, at the speed 2 m/s. calculate the carrying capacity of the belt in tonne/hr. CO 4 (Evaluate)
23. What is back hoe? Discuss about its parts and uses. CO4 (Remember)

24. Describe in detail the basic parameters of belt conveyor system. Write down the advantages and design of belt conveyor. CO4 (Understand)
25. Write note on Bulldozer & Road grader. CO4 (Remember)
26. Illustrate high angle belt conveyor system of transporting. What are its advantages? CO4 (Understand)
27. Explain Belt conveyor used in opencast mining. Write down the various merit and demerit of belt conveyor systems over truck haulage system. CO4 (Understand)
28. After blasting of mineral in opencast mines, the use of crusher is crucial. Discuss about in-pit crusher and its various type. CO4 (Apply)

**SECTION B (20 marks)**

29. Can you analyze the various criteria considered for the selection of heavy earth moving machinery (HEMM) in mining operations. (analyze)

**Summary Sheet**

**CO Wise**

| CO | Q. No | Marks |
|---|---|---|
| CO1 | 1,2,3,4,5,6,7,8 | 80 |
| CO2 | 9,10,11,12,13,14,15 | 70 |
| CO3 | 16,17,18,19,20,21 | 60 |
| CO4 | 22,23,24,25,26,27,28,29 | 80 |
| **Total** | | **290** |

**Unit Wise**

| Unit | Q. No | Marks |
|---|---|---|
| Unit 1 | 1,2,3,4,5,6,7,8 | 80 |
| Unit 2 | 9,10,11,12,13,14,15 | 70 |
| Unit 3 | 16,17,18,19,20,21 | 60 |
| Unit 4 | 22,23,24,25,26,27,28,29 | 80 |
| **Total** | | **290** |

**Blooms Taxonomy Level (BTL) Wise**

| BTL | Q. No | Marks |
|---|---|---|
| LOT | 1,2,5,6,9,11,16,17,18,19,20,23,24,25 | 140 |
| HOT | 3,4,7,8,10,13,14,15,18,20,21,26,28,29 | 200 |
| **Total** | | **340** |

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