

PRACTICE SET

End Semester Examination, December 2025

Program: B.Tech MiE

Semester: V

Course: MINE & MINERAL ECONOMICS

Course Code: 8PCCMiE409

| Course Outcomes | Description |
|------------------------|--|
| CO1 | Apply knowledge of mine economics for understanding mineral related policies and solve problems related with the mine economics. |
| CO2 | Analyze and solve the concepts of mine economics, its risk and mineral inventory. |
| CO3 | Describe the concept of mine sampling & illustrate the valuation of mineral deposit and be able to estimate the mine life and profitability. |
| CO4 | Discuss the forms of business, royalty, taxes & duties in mining sector. |

UNIT I

Section A (Each carries 5 marks)

1. Define Mineral? classify the minerals with example **UNDERSTAND CO1**
2. Explain the probable reserve? **UNDERSTAND CO1**
3. List the major and minor minerals give at least five example of each. **REMEMBER CO1**
4. What is sampling? Illustrate the method of cutting groove by using diagram? **UNDERSTAND CO1**
5. List the important roles of coal mining industry in the country's GDP? **REMEMBER CO1**

Section B (Each carries 10 marks)

6. Summarize your understanding on substitution of minerals giving an account on renewable and non-renewable sources of energy? **UNDERSTAND CO1**
7. Describe the different methods of sampling **REMEMBER CO1**
8. Explain the followings with suitable labelled diagram :
 - (a) Groove cut in the face of a drive
 - (b) Groove cut in the cross cut**ANALYSE CO1**
9. Distinguish between discounting and non-discounting technique of appraisal **ANALYSE CO1**
10. List important points of national mineral policy **REMEMBER CO1**
11. Explain the different patterns of borehole sampling. **UNDERSTAND CO1**

Section C (Each carries 20 marks)

12. A Concentrator pilot plant is fed with 1 tonne of copper ore at ROM grade of 1.5 % Cu. Metal recovery in the concentrator pilot plant is 90% and the grade of copper in concentrate is 20%. Calculate the amount of copper in concentrate and also calculate the amount of concentrate produced from 1tonne of ore in kg? **Evaluate CO1**

UNIT II

Section A (Each carries 5 marks)

13. Explain the causes of depreciation. **UNDERSTAND CO2**
14. List the objectives of depreciation. **REMEMBER CO2**
15. Define mineable and proved reserve? **REMEMBER CO2**
16. Describe about net present value and internal rate of return and its importance?
UNDERSTAND CO2

Section B (Each carries 10 marks)

17. Explain mine valuation? Describe various methods of mine valuation.
UNDERSTAND CO2
18. Define the term Critical Minerals. Describe them and also give the locations of these in India. (15 marks) **REMEMBER CO2**
19. What are the different methods of calculating depreciation? **REMEMBER CO2**
20. Explain ore reserves. How are they classified? **UNDERSTAND CO2**
21. Explain the following :- (a) Ore (b) Cut-off grade (c) Dilution
REMEMBER CO2
22. Discuss the Viability gap funding scheme which is recently launched by the government of India with reference to Mining Development? **UNDERSTAND CO2**
23. Explain about diminishing annuity method and Sinking fund method?
REMEMBER CO2

Section C (Each carries 20 marks)

24. Enumerate the listed critical minerals which is mentioned in the part d of schedule and what is the import value of these minerals in the financial year of 2023-2024?
EVALUATE CO2

UNIT III

Section A (Each carries 5 marks)

25. Differentiate between direct and indirect cost. **UNDERSTAND CO3**
26. Discuss about the core recovery and process of sampling. **UNDERSTAND CO3**
27. Illustrate the UNFC Classification system in india by providing the detailed explanation of three axis of it. **UNDERSTAND CO3**
28. Distinguish the function of NMET and DMF in the Jharkhand mineral development sector. **ANALYSE CO3**
29. Differentiate between prefeasibility and feasibility study. **UNDERSTAND CO3**

Section B (Each carries 10 marks)

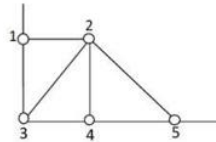
30. Judge the method of calculating the average grade of ore with neat clean diagram
a) Constant distance weighting technique
b) Inverse distance weighting technique **EVALUATE CO3**
31. Critique the theory of cash flow. What are the cash inflow ad cash outflow?
ANALYSE CO3



Section C (Each carries 20 marks)

32. A flat bauxite deposit has thickness of 10m with an average density of 2200 kg/m³. The grade value and the sample coordinate are shown in the below given table .

| | | | | | |
|--------------|-----|-----|----|-----|-----|
| Sample No | 1 | 2 | 3 | 4 | 5 |
| Alumina % | 35 | 40 | 39 | 47 | 42 |
| x coordinate | 0 | 200 | 0 | 200 | 500 |
| y coordinate | 300 | 300 | 0 | 0 | 0 |



Take the reference from the triangles are constructed in the figure to carry out reserve estimation using triangular method, the.

Evaluate CO3

33. A coal mine has an initial development cost of ₹120 Crores. The annual production is 5 lakh tonnes. Fixed annual operating costs are ₹10 Crores, and variable costs are ₹500 per tonne. Selling price is ₹1,200 per tonne.

Calculate the followings:

- Determine annual revenue and annual total cost.
- Calculate the annual profit before tax.
- Compute the payback period.
- Estimate the break-even production level

Evaluate CO3

UNIT IV

Section A (Each carries 5 marks)

- Classify the minerals the mineral reserves of India on the basis of sufficient and insufficient reserve. **UNDERSTAND CO4**
- Illustrate the Economic axis with reference to UNFC classification. **UNDERSTAND CO4**
- Explain the Reconnaissance with reference to mining exploration. **UNDERSTAND CO4**

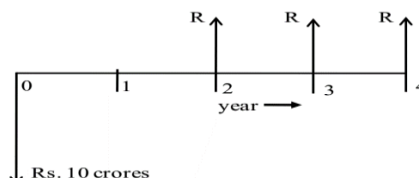
Section B (Each carries 10 marks)

- Define the profitability index along with its importance. **REMEMBER CO4**
- List the basic objectives of National mineral policy of India? **APPLY CO4**

Section C (Each carries 20 marks)

39. If the assay values of three samples groove length w_1 , w_2 and w_3 are 1.3% cu , 2.2 %cu and 1.4 % cu, and the true width $T_1=55\text{cm}$, $T_2=40$ and $T_3=60$ cm. calculate the average assay of the orebody ? **APPLY CO4**

40. Cash flow of a project of duration 4 years is shown in the figure. Calculate the uniform income 'R', in Rs. crores, at the end of 2nd, 3rd and 4th years for an internal rate of return of 10%. **Evaluate CO4**





**Summary Sheet:
CO Wise**

| CO | Q. No | Marks |
|--------------|--------------------------------------|--------------|
| CO1 | 1,2,3,4,5,6,7,10,11,8,9,12,13 | 125 |
| CO2 | 14,15,16,17,18,19,20,21,22,23,24,25, | 115 |
| CO3 | 26,27,28,30,29,31,32,34,35 | 115 |
| CO4 | 36,37,38,39,40,41,42 | 105 |
| Total | | 380 |

Unit Wise

| Unit | Q. No | Marks |
|--------------|--------------------------------------|--------------|
| Unit 1 | 1,2,4,5,6,7,8,9,10,11,12,13 | 130 |
| Unit 2 | 14,15,16,17,18,19,20,21,22,23,24,25, | 145 |
| Unit 3 | 26,27,28,29,30,31,32,33,34,35, | 115 |
| Unit 4 | 36,37,38,39,40,41,42,42 | 105 |
| Total | | 380 |

Blooms Taxonomy Level (BTL) Wise

| BTL | Q. No | Marks |
|--------------|---|--------------|
| LOT | 1,2,3,4,5,6,7,10,11,14,15,16,17,18,19,20,21,22,23,24,25,26, 27,28,30,36, 37,38,39,40 | 225 |
| HOT | 8.9.12.13,25,29,31,32,34,35 | 165 |
| Total | | 380 |

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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.