

Programme: B. Tech (MiE)
 Course: Underground Metal Mining
 Course Code: 8PCCMiE308
 Enrolment no. _____

 Full Marks: 70
 Time: 3 Hrs.

Q.No.	Questions	CO	Bloom Taxonomy Category	Marks
Section I				
1	Short Answer type questions.			
a	Explain with the help of a labeled diagram, the difference between a crown pillar, sill pillar, and rib pillar used in underground mining.	CO1	Understand	4 x 5 = 20
	or			
b	Suggest practical methods to enhance working conditions in metal mining environments, considering safety and operational efficiency.	CO1	Understand	
	or			
c	What does the term raising refer to in the context of underground metal mining? List and define the key terminologies involved in the process.	CO2	Remember	
	or			
d	Explain the terms stoping as used in underground metal mining. Mention the different types of stoping methods and briefly describe their principles.	CO2	Understand	
	or			
e	Explain how stoping methods are classified in underground metal mining. On what basis are they grouped and what are the key differences between them?	CO3	Understand	
	or			
f	Describe the haulage systems typically used in underground metal mines. How do these systems ensure safety and efficiency?	CO3	Understand	
	or			
g	Write down the benefits and limitations of using roof stitching and prop supports in underground excavations.	CO4	Understand	
	or			
h	Present a tabular summary showing how different underground mining methods are selected based on Ore body type & Dip & strike forms.	CO4	Remember	
	or			
Section II				
Long Answer type questions.				
2	Describe the various types of mine openings as shafts, adits, inclines. For each, discuss its design features, importance, and suitability based on geological and operational conditions.	CO1	Analyze	3 x 10 = 30
	or			
3	Conduct a comparative analysis between coal mining and metalliferous mining by highlighting the differences in techniques, geology, safety, and environmental impacts.	CO1	Analyze	
	or			
4	Classify and describe the key features of Breast Stopping and Cut-and-Fill Stopping methods. Include details about their stope preparation, advantages, and disadvantages.	CO3	Analyze	
	or			
5	Provide an illustration and explanation of the Block Caving method. Discuss the conditions under which it is applicable, along with its merits and limitations.	CO3	Apply	
	or			
6	Define a roof bolt and outline the key components of a roof bolting system used in underground coal mines. Also, explain the testing procedures used to verify roof bolt integrity.	CO4	Understand	
	or			
7	Suggest suitable support types for various geological roof conditions in underground mining. Discuss your recommendations for: i. Weak or unstable roofs ii. Fractured or jointed roofs	CO4	Evaluate	
	or			
Section III				
Application based questions				
8	Analyze and compare Long-hole raising and Raise boring methods used in underground metal mining. For each method, describe the construction process, its applicability, and outline the advantages and disadvantages, accompanied by suitable diagrams.	CO2	Evaluate	1 x 20 = 20
	or			
9	Provide an analytical overview of the following core elements in underground metal mining systems: (i) Crushing and Ore Loading Units (ii) Main Ore Pass Layout and Function (iii) Mine Ventilation and Ground Support Systems (iv) Support System Load Capacity and Design Considerations	CO2	Analyze	
	or			

COURSE OUTCOME

- CO1 Define & explain the underground mining of thick seam & hydraulic mining.
 CO2 Describe the working of hydraulic mining.
 CO3 Analyze the design of coal gasification techniques.
 CO4 Design & solve the deep mining method & special mining methods.