Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV/DEC 2024

MINING ENGINEERING
Third Semester
MI23301 – Mine Development
(Regulation 2023)

Time: 3hrs | Max. Marks: 100

CO 1	Understand the distribution of mineral deposits and mining terminology
CO 2	Analyze design requirement of approach to mineral deposits
CO 3	Obtain fundamentals related to the drilling and blasting operations
CO 4	Acquire basic knowledge on drifting and tunnelling
CO 5	Learn the overview of mining operations in underground and surface mines

BL – Bloom's Taxonomy Levels
(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Write short notes on critical minerals.	2	CO1	L1
2	State the various reserves and resources classification system used in mineral industry.	2	CO1	L2
3	Mention the factors affecting the selection of a site for sinking a main shaft.	2	CO2	L3
4	What are the field conditions influence on adopting the square and rectangle shaft?	2	CO2	L3
5	What do you mean by drillability?	2	CO3	L3
6	Classify the types of explosives and indicate it scope of field application.	2	CO3	L2
7	Illustrate the field conditions prevail for drivage of drift.	2	CO4	L3
8	Depict the significance of D-wall during the tunnel construction.	2	CO4	L2
9	Distinguish between 'footwall' and 'hanging wall'.	2	CO5	L3
10	Enumerate any four parameters to be considered for the selection of mine equipment.	2	CO5	L3

PART- B (5 x 13 = 65 Marks)
(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a)	Explain the preliminary investigation to be adopted on a site for the planning and the technical description to be incorporated in the feasibility study report. Indicate the pre-mining, mining and post-mining stages of operations to be adopted with neat sketches.	13	CO1	L2
	OR			
11 (b)	Describe the history development of mining sector in India. Discuss the present and future trends of Indian mining sector in the global scenario.	13	CO1	L2
12 (a)	Explain briefly on the following conditions of working i) shaft sinking through loose strata ii) shaft sinking through loose and hard strata alternative condition	 7 6	CO2	L3

	OR			
12 (b)	Explain briefly on the following conditions of working a) shaft sinking through highly fractured strata b) shaft sinking through water bearing strata	6 7	CO2	L3
13 (a)	Classify types of drilling method and explain salient features of each drilling method with the scope of field application. Discuss in details of various types of drilling pattern with its applicable in the field.	13	CO3	L3
	OR			
13 (b)	Discuss the mechanism of rock breakage by blasting operations and explain the types of sequence of blasting connection. Describe the connectivity of blasting accessories with neat flowchart.	13	CO3	L3
14 (a)	Explain the various cycles of operations involved in drivage of tunnel in metro rail. Discuss the field challenges associated with driving tunnels in the metro cities and provide the technical solutions to overcome such problems.	13	CO4	L4
	OR			
14 (b)	Explain the constructional features and working principles of tunnel boring machine with neat diagrams.	13	CO4	L4
15 (a)	Discuss in detail of bench geometry, limitations and field applicability of opencast mining method. Also, compare the pit geometry of 'opencast' with 'open pit' mining method.	13	CO5	L2
	OR			
15 (b)	Discuss in detail of types of underground coal mining methods. Describe the advantages, limitations and field applicability of Bord and Pillar method.	13	CO5	L2

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16.	Discuss the method of sinking a vertical shaft of 6 m finished diameter, 200 m deep, through a moderately strong strata condition with the help of suitable diagrams. Also, describe the various cycle of operations such as drilling pattern, blasting sequences, mucking, supporting and other operations for the progress of sinking operations.	15	CO2	L5