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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

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

MINING ENGINEERING

IV Semester

MI5401 - MINING MACHINERY - I

(Regulation 2019)

Time: 3hrs

Max. Marks: 100

CO1	Obtain basic knowledge on motive power used in mines; pumping
CO2	Understand the basic concepts related to rope haulage and face haulage.
CO3	Learn the design and constructional features of primary equipment used for loading and transportation in the underground mines.
CO4	Enhance the knowledge on concepts related to pumping & conveying transport systems.
CO5	Learn fundamental knowledge about mine electrical engineering in all statutory aspects.

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Appling, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20Marks)

(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1	Why locked coil wire rope used as guide rope in shaft?	2	1	2
2	Draw the 6 triangular flattened strands each of 8 wires.	2	1	1
3	State any four precautions while choosing the wire ropes	2	2	1
4	List down the various test carried out on wire rope	2	2	1
5	State the conditions to adopt locomotives in mines.	2	3	1
6	List out advantages of load haul dumpers in underground mines	2	3	1
7	What is the maximum theoretical suction head, explain how?	2	4	2
8	How the width of conveyor is selected for your mines?	2	4	2
9	Why high voltage power cables are used in transmission of electricity?	2	5	2
10	Briefly state the principle of MCB?	2	5	2

PART- B(5x 13=65Marks)

(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks	CO	BL
11 (a)	Discuss in detail various motive powers used in mines of different methods of working and their applicability, limitation, merits and demerits.	13	1	3
OR				
11 (b)	Explain in detail elements involved and classifications of transportation system used in mines.	13	1	3
12 (a)	Discuss in detail the selection of the wire ropes and different of type of ropes used for various operations in mines.	13	2	4
OR				
12 (b)	Explain in detail various safety devices used in in haulage system in detail.	13	2	4
13 (a)	Discuss various safety devices used in in haulage system used in underground mines.	13	3	3
OR				

13 (b)	Explain in detail underground locomotives applicability, features, different types and safety devices with neat diagram.	13	3	3
14 (a)	Explain in detail the centrifugal pump with neat sketch, operation, various fitting accessories, precaution of starting of the pumps	13	4	3
(ii)				
OR				
14 (b)	Discuss in detail the Belt conveyor operating with their types, merits and demerits of each.	13	4	3
15 (a)	Discuss in detail the transmission and distribution layout of electrical power in surface and underground mines	13	5	4
OR				
15 (b) (i)	Discuss in detail the construction and electrical cables used in mines.	6	5	4
(ii)	Differentiate the FLP apparatus with intrinsically safe apparatus and discuss their construction of safety aspect.	7		

PART- C(1x 15=15Marks)
(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16.	An underground metal mine having an average depth of 300m having multiple number of working place with dip 1 in 10° suggest the transport system to raise ore from underground to the surface with all necessary calculation, selection parameters, construction features of transport system, safety devices and limitation of system.	15	1,2,3	5

