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ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

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

MINING ENGINEERING

Sixth Semester

MI 5020 – Mine Safety Engineering

(Regulation 2019)

Time:3hrs

Max. Marks: 100

CO1	Mine accidents
CO2	Health & mines safety.
CO3	Fault tree analysis.
CO4	Risk assessment & disaster management.
CO5	Miner's occupational diseases & enquiry committee.

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)	What are the various types of Mine Accidents in the Indian context ?	2	1	11
2)	What does 'ZAP' stand for ?	2	1	12
3)	Which is the nodal Ministry of the Govt. of India for safety in mines ?	2	2	11
4)	Which year was the first Mines Act enacted ?	2	2	11
5)	Which agency/institution awards Penalties under the Mines Act, 1952 ?	2	2	12
6)	Risk is generally quantified as a multiplication of which all measurable units of hazard ?	2	4	12
7)	Name the different schemes under which the National Safety Awards (Mines) are given.	2	2	11
8)	In the Fault Tree Analysis, Top and Basic events are denoted by what symbols respectively ?	2	3	11
9)	Define 'Hazard' and 'Risk'.	2	4	11

10)	As per the recommendations of the 12 th Conference on Safety in Mines, what is the permissible level of respirable dust in mines ?	2	5	L1
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PART- B (5x 13=65Marks)

(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a)	Describe in details as to how investigations into mine accidents are to be conducted.	8	1	L3
(i)				
(ii)	Under the Indian context, what are the two principal classification of mine accidents ? Explain with elaboration.	5	1	L3
OR				
11 (b)	What are the various strategies for creating and maintaining safety awareness in mines ?	7	1	L2
(i)				
(ii)	What is 'JSA' and explain the steps involved in carrying out JSA in a mine.	6	1	L2
12 (a)	What are the various role, function and responsibilities of the management on safety promotion in the mines under their control.	13	2	L3
OR				
12 (b)	Elaborate on the current mine safety statutes in India and their important area of regulation In mines.	13	2	L3
13 (a)	Explain the methodology of 'Fault Tree Analysis' with an example.	13	3	L2
OR				
13 (b)	Explain the importance of system design on mine safety and also the application methodology of the same.	7	3	L2
(i)				
13 (b)	Define 'Top Event' and 'Basic Event' in a Fault Tree with an example.	6	3	L2
(ii)				
14 (a)	Elaborate on the key steps connected to Risk Management in mines.	7	4	L3
(i)				
14 (a)	What are the key principles of Risk Assessment in Mines ?	6	4	L3
(ii)				
14 (b)	What do you understand by the term 'Safety Culture' in a mining organization ? What are the key elements and characteristics of an acceptable levels of safety culture in a mining organization ?	7	4	L3
(i)				



i14 (b) (ii)	Explain the key methodology of conduct of a mine safety audit	6	4	L3
15 (a)	What are the key occupational health concerns in Indian mines ? What are the key strategies of preventive medical examination in relation to occupational health hazard in a mine?	13	5	L2
OR				
15 (b)	What are compensable diseases? Elaborate on the importance of 'Medical attention and removal of causative factors of such occupational health hazards in a mine.	13	5	L2

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

Q. No	Questions	Mark s	CO	BL
16 (a)	What are the key strategies for accident prevention in mines ?	5	1	L6
16 (b)	In an opencast coal mine producing about 3 M.T of coal and 10 M.M ³ of overburden annually, there has been a regular occurrence of fatal accidents due to transportation machinery. Assuming your own conditions, pl. formulate an appropriate Risk Management Plan with a clear mitigation strategy of the identified hazards.	10	4	L6

