JHARKHAND Rai University
RANCHI

End Semester/Reappear (Semester VII) Examination December, 2024

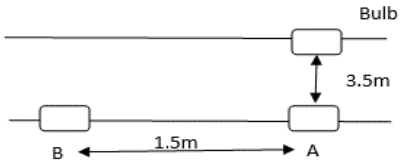
Programme:B.Tech (MiE)

Course: Mine Environmental Engineering **Full Marks: 70**

Course Code: 8PCCMiE401 **Time: 3 Hrs.**

Enrolment no. _____

Q.No.	Questions	CO	Bloom Taxonomy Category	Marks
Section I				
1	**Short Answer type questions.**			**4 x 5 = 20**
a	Discuss about the different class of fire. Enlist all of them.	CO1	Understand	
	or			
	Describe the isolation of fire and also state the disadvantages of the same.	CO1	Understand	
b	Define Le Chatelier Principle used in explosion. Evaluate the lower limit of explosibility of a gaseous mixture containing 80% methane, 10% hydrogen, 10% ethane.	CO2	Evaluate	
	or			
	Summarize the causes of Firedamp explosion.	CO2	Understand	
c	Differentiate ignition temperature and lag on ignition.	CO3	Understand	
	or			
	Discuss the rescue apparatus gas mask.	CO3	Understand	
d	What is stone dust? Summarize the desirable qualities of stone dust.	CO4	Understand	
	or			
	Define Pneumoconiosis. Classify it types.	CO4	Remember	
Section II				
Long Answer type questions.				**3 x 10 = 30**
2	Suggest various types of Flame Proof Extinguisher's which are used in mines and discuss about their applicability condition for different types of Fire.	CO1	Apply	
	or			
	Plan the precautions which you will take in mine to prevent spontaneous heating.	CO1	Apply	
3	In underground you have seen various types of stopping used for sealing a fire, classify them. Illustrate about the permanent stopping with its specification. Sketch suitable diagram.	CO2	Apply	
	or			
	Elucidate about Firedamp explosion & coal dust explosion. What are the explosibility limit of firedamp and coal dust explosion? Discuss about the major preventions to deal with it.	CO2	Apply	
4	In underground if you are manager of mines and you have observed a fire which is extensive in nature which may lead to explosion, what steps you will take just after observing fire	CO3	Apply	
	or			
	Discuss about stone dust barriers. Summarize the properties and types of stone dust barriers in detail.	CO3	Apply	
Section III				
	Application based questions			
5	Floor illumination at a point directly below a light source in an underground place of height 4m is 40 lux. Calculate the floor illumination in lux at a point 8m away from the light source?	CO4	Evaluate	
	or			

	A filament bulb produces 30 Lux illumination at point as shown in the figure. Assuming that no other source of lighting present in the roadway, calculate the illumination level in Lux at point B?  	CO4	Evaluate	**1 x 20 = 20**

Course Outcome:

On the completion of the Course, the students will be able to:

CO1 Understand the basic concept of mine fire & spontaneous combustion with detection, control, dealing and prevention in underground mine.

CO2 Explain the causes & prevention of mine explosions like firedamp & coal dust explosion.

CO3 Gain knowledge of causes & prevention of inundation and uses of the rescue apparatus properly.

CO4 Analyze the causes of production of air born dust and its control as well as prevention and the standard of illumination at working place and other parts of the mine.