GUJARAT TECHNOLOGICAL UNIVERSITY
BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2024

Subject Code:3162207   **Date:25-11-2024**
Subject Name:Mine Ventilation
Time:02:30 PM TO 05:00 PM   **Total Marks:70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	Write the composition of dry air.	**03**
	(b)	What do you understand by standard of ventilation?	**04**
	(c)	Why carbon monoxide gas is considered as the most dangerous gas in mines? Explain its detection process and physiological effect.	**07**
Q.2	**(a)**	What do you understand by blackdamp?	**03**
	(b)	How firedamp is detecting by using flame safety lamp?	**04**
	(c)	What do you understand by methane drainage? Explain any one method of methane drainage with a neat sketch.	**07**
		OR	
	(c)	What is the physiological effect of the following gases on human beings? (a) H_2S (b) SO_2 (c) CO_2	**07**
Q.3	**(a)**	What do you understand by Reynolds number?	**03**
	(b)	Explain the Salient points of Cowards Diagram with neat sketch	**04**
	(c)	Discuss the construction, application and operation of whirling hygrometer with neat sketch.	**07**
		OR	
Q.3	**(a)**	Write the recommendations of air velocity required at various places of underground mine as per CMR 1957?	**03**
	(b)	Write a note on Kata Thermometer.	**04**
	(c)	Write a brief note on axial flow fan with neat sketch.	**07**
Q.4	**(a)**	Write a note on Equivalent Resistance of mines.	**03**
	(b)	How pressure loss is determined by Atkinson's Equation? Explain with one example.	**04**
	(c)	Name the flow control devices used in mine ventilation. Discuss any two.	**07**
		OR	
Q.4	**(a)**	Differentiate between frictional resistance and shock resistance.	**03**
	(b)	What do you mean by equivalent orifice? Explain with neat sketch.	**04**
	(c)	How is natural ventilating pressure produced? Derive the equation of natural ventilation pressure from air density.	**07**
Q.5	**(a)**	Explain are the factors affecting the economic design of mine airway.	**03**
	(b)	Discuss auxiliary ventilation system with neat sketch.	**04**
	(c)	Explain centrifugal fan in detail.	**07**
		OR	
Q.5	**(a)**	Write the steps involved in ventilation planning.	**03**
	(b)	Discuss the effect of heat & humidity at the work places.	**04**
	(c)	Name the instruments used for ventilation survey. Explain any one in detail.	**07**

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