Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering - SEMESTER - IV EXAMINATION - WINTER 2025

Subject Code: 114AA01 **Date: 03-12-2025**

Subject Name: Fundamental of Fire Engineering

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.**

			Marks
Q.1	**(a)**	Define work, energy and power with suitable units and examples.	**03**
	(b)	Explain the law of conservation of energy with a suitable real-life example.	**04**
	(c)	State and explain Newton's laws of motion and discuss their applications in fire safety.	**07**
Q.2	**(a)**	List and define the components of an active fire protection system and state its importance.	**03**
	(b)	Differentiate between exothermic and endothermic reactions with suitable examples.	**04**
	(c)	Explain in detail the concept of fire tetrahedron and its significance in fire prevention.	**07**
		OR	
	(c)	Discuss lower and upper flammability limits (LFL and UFL) and their dependence on temperature and pressure.	**07**
Q.3	**(a)**	What is a fire bucket? Mention its construction and use.	**03**
	(b)	Explain the construction and working principle of a portable fire extinguisher.	**04**
	(c)	Explain the classification of fire based on the nature of combustible materials, with suitable examples for each class.	**07**
		OR	
	(a)	Write the general causes of fire in chemical industries.	**03**
	(b)	Explain the classification of different types of fire extinguishers and describe their specific applications.	**04**
	(c)	Explain the importance of an active fire protection system in industrial premises.	**07**
Q.4	**(a)**	Explain the working principle of the sprinkler system.	**03**
	(b)	Describe the approximate method for calculating fire resistance of structures.	**04**
	(c)	Write a short note on the foam pourer system.	**07**
		OR	
	(a)	Explain the emulsification method for firefighting.	**03**

	(b)	Explain the process of assessing fire-damaged buildings and the factors considered during assessment.	**04**
	(c)	List the main components of an aircraft fire-fighting system and state their functions.	**07**
Q.5	**(a)**	Define fire resistance rating with suitable examples.	**03**
	(b)	Explain the concept of emergency lighting and describe its importance during fire or power failure situations.	**04**
	(c)	Explain internal staircase management and emergency lighting requirements for fire prevention.	**07**

OR

	(a)	List the factors that affect the reparability of fire-damaged buildings.	**03**
	(b)	Explain the procedure for testing and maintenance of fire alarm and detection systems to ensure their reliability.	**04**
	(c)	Explain escape, evacuation, and rescue assessment in detail.	**07**

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