Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE(MINOR) - SEMESTER–V EXAMINATION – SUMMER 2023

Subject Code:115AA02 Date:09-08-2023

Subject Name:Safety in Chemical Industry

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)**	What is the purpose of a safety data sheet?	**03**
	(b)	Classify chemicals based on nature in details with two examples.	**04**
	(c)	Explain the need of safety planning in industry.	**07**
Q.2	**(a)**	Write hazardous properties of Ammonia and chlorine.	**03**
	(b)	What are the various safety devices to be used during underground storage of Chemical?	**04**
	(c)	Explain the various precautions and facilities to be considered and provided in LPG storage with a layout.	**07**
		OR	
	(c)	List out the precautions to be made in chlorine storage, ammonia storage in drum and cylinder storages.	**07**
Q.3	**(a)**	Define alarm and sensor with suitable examples..	**03**
	(b)	What are chemical reaction hazards? Explain with suitable examples.	**04**
	(c)	Write a short note on HAZOP Study.	**07**
		OR	
Q.3	**(a)**	Write any three color code for pipeline.	**03**
	(b)	Explain the safety trip system and interlock system needed for plant operation.	**04**
	(c)	Explain safety measures to be considered in storage of flammable liquids or solvents.	**07**
Q.4	**(a)**	Classify the various types of pressure relief valve.	**03**
	(b)	List out sources of radioactive hazards with one example of each.	**04**
	(c)	Explain how DCS system will aide to safety of plant operations.	**07**
		OR	
Q.4	**(a)**	Write the causes of failure in pressure system.	**03**
	(b)	With significance of LD_{50} and LC_{50}, explain toxicity in chemicals.	**04**
	(c)	List out the precautions and safety checklist for transporting hazardous/toxic and flammable chemicals.	**07**
Q.5	**(a)**	Classify the various types of emergency planning in a industry.	**03**
	(b)	Compile the check list for inspection of corrosion and erosion in chemical industry.	**04**
	(c)	Explain in detail the causes of serious accidents in the chemical industries during the maintenance work in equipment and precautions to avoid such accidents.	**07**
		OR	
Q.5	**(a)**	Briefly explain about various types of maintenance and explain any one in detail.	**03**
	(b)	List out the checklist for routine inspection and break down maintenance in chemical industry.	**04**
	(c)	Explain how Safe start up and shut down procedures importance in chemical industry with a suitable example.	**07**

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