

GUJARAT TECHNOLOGICAL UNIVERSITY**BE MINOR - SEMESTER-V EXAMINATION – SUMMER 2024****Subject Code:115AA02****Date:06-06-2024****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 are the check points need to be familiar with when handling chemical processes through control rooms?	03
(b) Define below mentioned terms used during kinetic-thermodynamic properties study in process safety. (1) Adiabatic Flame Temperature, (2) Combustible Dust, (3) Quenching Distance, (4) Limiting Oxidant Concentration	04
(c) How corrosion is effected safety of the equipment? Write a note on Corrosion and erosion prevention.	07
Q.2 (a) Explain about the “Filling Ratio” in storage vessels.	03
(b) Write detailed explanation about working and application Pressure Relief Valves, and give a few examples.	04
(c) Write general guidelines for the handling of flammable liquids.	07
OR	
(c) Why Pressure Relief Devices are important in tanks? Explain application of various Pressure Relief Devices in tanks for the safety purpose.	07
Q.3 (a) Write down various temperature measurement instruments used in Process Control Systems.	03
(b) In which situation Emergency Shutdown becomes necessary? Explain about the procedures need to be adopted for the Emergency Shutdown.	04
(c) List out generally used Unit Processes with their application in industries and Process Hazard involved with the specific Unit Process.	07
OR	
Q.3 (a) Explain use of below mention instruments used for safe Plant Operations. (1) Anemometer, (2) Atmometer, (3) Dasymer	03
(b) List out the safety and emergency equipments required in the Laboratory.	04
(c) Evaluate consequences due to deviations in Operational Parameters in process.	07
Q.4 (a) Write full form of these terms: CVCE, UVCE, BLEVE	03
(b) Write Short Note on “Need of safety in Chemical Industry”.	04
(c) Explain TNT Equivalent Model.	07
OR	
Q.4 (a) Explain how Location is one of the important factor in plan sitting.	03
(b) Explain general principles to be considered for good Plant Layout.	04

- (c) Briefly explain about Deflagration and Detonation explosion mechanisms. **07**
- Q.5** (a) What are the Major causes of material or equipment failure which need to be periodically tested? **03**
- (b) Write short note on Safety Aspects of Pipe work. **04**
- (c) Write a note on In-Plant transfer of chemicals. **07**
- OR**
- Q.5** (a) In which situation ducting should be provided along with the rupture disc? Why? **03**
- (b) Write down precautions to be taken during breaking pipelines? **04**
- (c) When transporting the chemicals, explain Emergency Actions need to be taken in case of “toxic release” and in case of “flammable chemicals”. **07**
