

Enrollment No./Seat No.:

GUJARAT TECHNOLOGICAL UNIVERSITY
Bachelor of Engineering - SEMESTER - VI EXAMINATION - WINTER 2025

Subject Code: 3162509

Date: 19-11-2025

Subject Name: Plant Maintenance and Safety 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) List different types of equipment failures.	03
(b) Differentiate between FTA and FMECA with an example.	04
(c) Analyze the merits and demerits of opportunistic maintenance in large-scale industries.	07
Q.2 (a) List any three lubricant monitoring methods.	03
(b) Explain the use of thermography in condition monitoring.	04
(c) Evaluate different condition monitoring techniques for hydraulic pump	07
OR	
(c) Analyze short-term vs long-term planning for a thermal power plant.	07
Q.3 (a) Define job scheduling.	03
(b) Apply the concept of job cards for a lathe machine.	04
(c) Design a safety checklist for a workshop with heavy machinery.	07
OR	
(a) Differentiate between on-line and off-line condition monitoring.	03
(b) Explain briefly how vibration analysis is used to identify misalignment in a centrifugal pump.	04
(c) Develop a simple flow diagram showing systematic plant maintenance.	07
Q.4 (a) Define breakdown maintenance and preventive maintenance.	03
(b) State the objective of CMMS.	04
(c) Evaluate the role of productivity circles in successful TPM.	07
OR	
(a) What is creative maintenance?	03
(b) Explain the role of a reliability engineer.	04
(c) Prepare an audit checklist for a chemical industry.	07

- Q.5 (a)** Explain 5-Zero Concept in modern industries. **03**
- (b)** Differentiate between frequency and incident rate. **04**
- (c)** Analyze the relationship between productivity, quality, and safety in plant operations. **07**

OR

- (a)** Differentiate between safety inspection, safety survey, and safety audit. **03**
- (b)** State the meaning of accident frequency rate and severity rate **04**
- (c)** Examine the factors contributing to unsafe acts vs. unsafe conditions in an industrial environment. **07**
