

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

**Subject Code: 3161913**

**Date: 26-05-2025**

**Subject Name: Industrial Safety and Maintenance Engineering**

**Time: 10:30 AM TO 01:00 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) What are the causes of equipment breakdown? **03**  
(b) What is fault tree analysis and root cause analysis ? **04**  
(c) List and explain the characteristics of successful product development. **07**
- Q.2** (a) How to eliminate hazards? **03**  
(b) Explain how overall maintenance cost can be reduced. **04**  
(c) Discuss with example predictive and preventive maintenance. **07**
- OR**
- (c) What is Personal Protective Equipment (PPE)? Explain different PPEs used for industrial safety. **07**
- Q.3** (a) Explain a minor and major accidents in industries. **03**  
(b) Prepare the fault tree analysis (FTA) for “no light in the room” **04**  
(c) What is Job Safety Analysis? Explain its objectives and procedure along with the limitations in detail. **07**
- OR**
- Q.3** (a) Explain different applications of Gantt and Bar Chart along with its limitations. **03**  
(b) Write short note on Fault Tree Analysis. **04**  
(c) Explain the assembly of Ball and Roller bearing. **07**
- Q.4** (a) What are the objectives of quality circle? **03**  
(b) Explain Off-site Emergency Plan in brief. **04**  
(c) Explain HAZOP with its objectives, advantages and limitations. **07**
- OR**
- Q.4** (a) Define maintainability, reliability and productivity. **03**  
(b) Explain short term and long term maintenance plan. **04**  
(c) List various types of maintenance carried out at refineries. Explain any two in detail. **07**
- Q.5** (a) Brief note on CPM and PERT for scheduling work. **03**  
(b) How safety survey is conducted in industries? **04**  
(c) What is FMEA? How does FMEA help maintenance personnel. **07**
- OR**
- Q.5** (a) State the types and reasons of wear in machines. **03**  
(b) What are the safety rules need to be follow inside your college workshop? **04**  
(c) Enlist the steps of job safety analysis (JSA) and prepare the job safety analysis to perform the “TIG welding on stainless steel parts”. **07**

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