

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**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3161913****Date:20-05-2024****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.

		MARKS
Q.1	(a) Explain different applications of Gantt and Bar Chart along with its limitations.	03
	(b) Write short note on: Quality Circle in maintenance.	04
	(c) Explain different Safety Measures to prevent accidents and improve productivity.	07
Q.2	(a) What is corrosion? List down different factors influencing corrosion.	03
	(b) Explain Reliability and Failure Rate using Bath Tub Curve.	04
	(c) Explain the assembly of Ball and Roller bearing.	07
OR		
	(c) What is wear? Explain different types of wear with suitable examples.	07
Q.3	(a) Classify different types of failure in detail.	03
	(b) Write short note on Fault Tree Analysis.	04
	(c) Explain Vibration Monitoring for predictive maintenance in detail.	07
OR		
Q.3	(a) Explain Breakdown Maintenance along with its advantages and disadvantages.	03
	(b) Write short note on Design Out Maintenance.	04
	(c) Explain Failure Modes and Effect Analysis in detail. Also list down advantages and disadvantages of the same.	07
Q.4	(a) Write down advantages and limitations of PERT.	03
	(b) Explain different factors involved in effective planning of maintenance work.	04
	(c) What is Job Safety Analysis? Explain its objectives and procedure along with the limitations in detail.	07
OR		
Q.4	(a) What is the significance of Safety Training?	03
	(b) Write down different types and categories of accidents.	04
	(c) Explain different types of Maintenance Plans with suitable examples.	07
Q.5	(a) What are the benefits of JSA?	03
	(b) Explain Off-site Emergency Plan in brief.	04
	(c) Explain different elements for Ensuring Safety in Planning in detail.	07

OR

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| Q.5 | (a) | Write short note on Factors Influencing the Plant Layout. | 03 |
| | (b) | Explain Safe Design Procedure in brief. | 04 |
| | (c) | What is Condition Based Maintenance System? Explain Online and Offline Monitoring. | 07 |

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3161913****Date:10-07-2023****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.

		MARKS
Q.1	(a) What are the objectives of quality circle?	03
	(b) Explain how overall maintenance cost can be reduced.	04
	(c) Explain HAZOP with its objectives, advantages and limitations.	07
Q.2	(a) Explain Assembly of Keyed Joints.	03
	(b) Discuss causes of accidents in industrial plant.	04
	(c) What is wear? Explain various types of wear with neat sketches	07
	OR	
	(c) Explain different types of industrial accidents. Enlist the steps for accident prevention.	07
Q.3	(a) Define maintainability, reliability and productivity.	03
	(b) What is vibration monitoring? List out the causes of vibration in machine/plant.	04
	(c) List various types of maintenance carried out at refineries. Explain any two in detail.	07
	OR	
Q.3	(a) What is condition base maintenance system (CBMS)	03
	(b) Write a short note on “Ferrography”.	04
	(c) What is FTA (Fault tree analysis), Why it is carried out? Explain its procedure and various event symbol.	07
Q.4	(a) Brief note on CPM and PERT for scheduling work.	03
	(b) Explain short term and long term maintenance plan.	04
	(c) What is planning in maintenance? Explain various factors involved in effective planning of maintenance work.	07
	OR	
Q.4	(a) Explain Equipment Downtime Analysis.	03
	(b) How safety survey is conducted in industries?	04
	(c) List out the PPEs for safety. How PPEs are useful in protecting various body parts? Explain Briefly	07
Q.5	(a) Which are the elements involved in procedure for ensuring safety in planning.	03
	(b) What are the safety rules need to be follow inside your college workshop?	04
	(c) What are the objectives of Emergency Plan? Explain the Onsite and offsite Emergency.	07
	OR	
Q.5	(a) What are the objectives of good plant layout.	03
	(b) What is job safety analysis (JSA), Write down its objectives.	04
	(c) Why safety measures are required in industries. Explain safety measures in detail.	07

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GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3161913****Date:06/06/2022****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.

MARKS

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|------------|--|-----------|
| Q.1 | (a) What are objectives of Maintenance department? | 03 |
| | (b) Differentiate the breakdown maintenance and preventive maintenance. | 04 |
| | (c) What do you mean by safety? How Safety Engineering helps in improving productivity of an organization? -Discuss. | 07 |
| Q.2 | (a) Define Quality, Productivity and Reliability. | 03 |
| | (b) Enlist the personal protective equipments with their functions. | 04 |
| | (c) Explain the Hazard and Operability Study (HAZOP). | 07 |
| | OR | |
| | (c) Explain the concept of 'Reliability centered maintenance' in detail. | 07 |
| Q.3 | (a) Draw any three symbol for fault tree analysis (FTA). | 03 |
| | (b) Prepare the fault tree analysis (FTA) for "no light in the room" | 04 |
| | (c) Enlist types of failures/defects. Discuss briefly (1) Equipment downstream analysis (2) Fault tree analysis (FTA). | 07 |
| | OR | |
| Q.3 | (a) Mention what are the challenges that maintenance and repair work usually face? | 03 |
| | (b) Explain how overall maintenance cost can be reduced. | 04 |
| | (c) Explain the defect due to wear of equipments and its preventions. | 07 |
| Q.4 | (a) Which factors are involved in effective planning of maintenance work. | 03 |
| | (b) Explain the planning procedure in industry. | 04 |
| | (c) Define planning and scheduling. Differentiate planning and scheduling work in industry with suitable example. | 07 |
| | OR | |
| Q.4 | (a) Justify the statement "safety comes first". | 03 |
| | (b) Explain roll of management in industrial safety. | 04 |
| | (c) Discuss briefly: (1) Safety Trials and (2) Industrial Hygiene (3) Alarm and Hazard Defense Plans. | 07 |
| Q.5 | (a) What are the causes of an accident? | 03 |
| | (b) Write note on 'Safety training and publicity'. | 04 |
| | (c) Explain the principle of wear debris analysis and explain Ferrography method of wear debris analysis. | 07 |

OR

- Q.5** (a) What is quality circle? Enlist the different elements of quality circle structure. **03**
- (b) What are the safety rules during maintenance? **04**
- (c) What do you mean by condition monitoring? List out various methods of condition monitoring and explain any one. **07**
