

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VI EXAMINATION – WINTER 2025

Subject Code:3161913

Date:19-11-2025

Subject Name:Industrial Safety and Maintenance 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.

Q.1	(a) Define: (i) Quality, (ii) Reliability, (iii) Maintainability.	03
	(b) How does FEMA help maintenance personnel ?	04
	(c) Explain how management and government helps in implementation of safety at any organization/industry.	07
Q.2	(a) Write a objectives of industrial legislation?	03
	(b) What is fault tree analysis and root cause analysis ?	04
	(c) Describe the procedure for ensuring safety in planning, building and operating plants.	07
	OR	
	(c) List and explain the characteristics of successful product development.	07
Q.3	(a) What is wear debris analysis ?	03
	(b) What is Hazard and Operability (HAZOP) Study?	04
	(c) How industrial psychology is helpful in preventing accident in Industries?	07
	OR	
Q.3	(a) What are the causes of equipment breakdown?	03
	(b) Discuss causes of accidents in industrial plant.	04
	(c) State types of hazards and explain any three in detail with possible causes and remedial actions.	07
Q.4	(a) What is Spectroscopy?	03
	(b) Enlist the steps of accident and dangerous occurrence reporting.	04
	(c) Describe briefly about the safety training.	07
	OR	
Q.4	(a) Explain a minor and major accidents in industries.	03
	(b) Enlist the factors involved in effective planning of maintenance work.	04
	(c) Explain Leakage Monitoring and Vibration Monitoring.	07
Q.5	(a) Justify the statement “safety comes first”	03
	(b) Prepare the fault tree analysis (FTA) for “no light in the room”	04
	(c) Discuss with example predictive and preventive maintenance.	07
	OR	
Q.5	(a) How to eliminate hazards?	03
	(b) Explain how overall maintenance cost can be reduced.	04
	(c) What is Personal Protective Equipment (PPE)? Explain different PPEs used for industrial safety.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VI (NEW) EXAMINATION – WINTER 2024****Subject Code:3161913****Date:28-11-2024****Subject Name:Industrial Safety and Maintenance 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) What do you mean by quality? Explain the concept of quality circle. **03**
 (b) Explain short term and long term maintenance plans. **04**
 (c) Explain the Hazard and Operability Study (HAZOP). **07**

Q.2 (a) Classify different types of failure in detail. **03**
 (b) Explain Breakdown analysis template by taking an example of any company. **04**
 (c) What is FMEA? How does FMEA help maintenance personnel? **07**

OR

(c) Explain the causes of wear of equipments and its preventions. **07**

Q.3 (a) Define: 1. Opportunistic Maintenance, 2. Routine Maintenance and, 3. Predictive Maintenance **03**
 (b) What is Ferrography? **04**
 (c) Explain the factors involved in the effective planning of maintenance work. **07**

OR

Q.3 (a) Explain Equipment Downtime Analysis **03**
 (b) Explain the considerations for “design for maintainability” in details. **04**
 (c) Explain the assembly of Ball and Roller bearing. **07**

Q.4 (a) Write short note on Design Out Maintenance. **03**
 (b) Explain Off-site Emergency Plan in brief. **04**
 (c) State the main objectives of preventive maintenance and explain the preventive maintenance in details. **07**

OR

Q.4 (a) Define following in terms of maintenance: **03**
 (1) Planning and, (2) Scheduling.
 (b) Explain CPM with its advantages & limitations **04**
 (c) Explain the ‘Vibration monitoring’ in detail. **07**

Q.5 (a) What are the causes of an accident? **03**
 (b) What are the safety rules need to be follow inside your college workshop? **04**
 (c) Explain the different type of safety training conducted in any organization. **07**

OR

Q.5 (a) What is job safety analysis (JSA), Write down its objectives? **03**
 (b) Explain the main objectives of good plant layout. **04**
 (c) Enlist the personal protective equipments with their functions. **07**

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3161913****Date:07-12-2023****Subject Name:Industrial Safety and Maintenance 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) Define the following terms: 1) Quality circle. 2) Reliability.	03
	(b) Explain the different elements to be considered during design stage to improve the maintainability of the system.	04
	(c) Enlist the main reason behind the equipment breakdown and explain it in details.	07
Q.2	(a) List down the different types of corrosion and state the important factor affecting the corrosion.	03
	(b) Explain the effect of corrosion on the performance of machine.	04
	(c) Explain the reasons for the wear of machine component in details.	07
OR		
	(c) Explain the procedure for the assembly of the taper sunk key joints.	07
Q.3	(a) Draw the various gate symbols used in fault tree analysis (FTA) and state its meaning.	03
	(b) Explain the different ways to reduce the downtime of the equipment.	04
	(c) Explain the FMEA (Failure Mode and Effect Analysis) techniques and state the advantages and limitation of it.	07
OR		
Q.3	(a) Differentiate between offline condition monitoring and online condition monitoring.	03
	(b) Explain the Gannt chart and state its limitation.	04
	(c) Explain the different methods of ferrography in details.	07
Q.4	(a) Differentiate between planned maintenance and unplanned maintenance.	03
	(b) State the advantages and limitations of condition base maintenance system.	04
	(c) State the main objectives of preventive maintenance and explain the preventive maintenance in details.	07
OR		
Q.4	(a) Define the following terms: 1) Maintenance planning. 2) Maintenance scheduling.	03

(b) Explain the following terms: **04**
1) Major repair.
2) capital repair.

(c) Explain the factors involved in the effective planning of maintenance work. **07**

Q.5 (a) Differentiate between reportable type accident and non-reportable type accident. **03**

(b) Enlist the different causes of industrial accident and explain any two causes in details. **04**

(c) Explain the different type of safety training conducted in any organization. **07**

OR

Q.5 (a) Enlist the requirements of suitable PPE to protect the worker. **03**

(b) Explain the main objectives of good plant layout. **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 – WINTER 2022****Subject Code:3161913****Date:15-12-2022****Subject Name:Industrial Safety and Maintenance 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) Define: (i) Quality, (ii) Reliability, (iii) Maintainability.	03	
	(b) Discuss causes of accidents in industrial plant.	04	
	(c) State types of hazards and explain any three in detail with possible causes and remedial actions.	07	
Q.2	(a) State the types and reasons of wear in machines.	03	
	(b) What is corrosion? How it could be prevented?	04	
	(c) Explain different types of industrial accidents. Enlist the steps for accident prevention.	07	
OR			
	(c) Describe briefly about the safety training.	07	
Q.3	(a) State types of failure. Explain defect analysis and failure analysis.	03	
	(b) Define: Opportunistic Maintenance, Routine Maintenance, Preventive Maintenance, Predictive Maintenance.	04	
	(c) What is fault tree analysis? Apply it for a car accident and suggest detail analysis.	07	
OR			
Q.3	(a) What are the causes of equipment breakdown?	03	
	(b) Differentiate between planned maintenance and unplanned maintenance.	04	
	(c) What is FMEA? How does FMEA help maintenance personnel.	07	
Q.4	(a) What is condition base maintenance system?	03	
	(b) Explain short term and long term maintenance plans.	04	
	(c) Explain Leakage Monitoring and Vibration Monitoring.	07	
OR			
Q.4	(a) What is Spectroscopy?	03	
	(b) Enlist the factors involved in effective planning of maintenance work.	04	
	(c) Explain Visual and Temperature Monitoring in detail.	07	
Q.5	(a) What is Hazard and Operability (HAZOP) Study?	03	
	(b) Enlist steps of Job Safety Analysis (JSA).	04	
	(c) Describe the procedure for ensuring safety in planning, building and operating plants	07	
OR			
Q.5	(a) Define: Inherent Safety Measures, Passive Safety Measures, Active Safety Measures.	03	
	(b) Enlist the steps of accident and dangerous occurrence reporting.	04	
	(c) What is Personal Protective Equipment (PPE)? Explain different PPEs used for industrial safety.	07	
