

**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.

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

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