Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII EXAMINATION – WINTER 2025

Subject Code: 3171929 Date:13-11-2025

Subject Name: Quality and Reliability 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)**	Explain briefly Bench Marking.	**03**
	(b)	What is the obstacles to implementing a TQM.	**04**
	(c)	Explain Quality Production through KANBAN.	**07**
Q.2	**(a)**	State objectives of qualiy control.	**03**
	(b)	Explain the concept of 5S.	**04**
	(c)	Define Zero defects. Discuss various steps in implementing Zero defects.	**07**
		OR	
	(c)	Define Maintainability and availability and compare it with reliability.	**07**
Q.3	**(a)**	What is Muda? Explain the various types of Muda.	**03**
	(b)	Discuss the Risk Assessment procedures in design.	**04**
	(c)	What are the types of System reliability models? Discuss with examples.	**07**
		OR	
Q.3	**(a)**	Discuss Just in Time Concept.	**03**
	(b)	Explain PDCA cycle.	**04**
	(c)	Define QFD and Discuss house of quality-product planning matrix.	**07**
Q.4	**(a)**	List out 7 new Quality improvement tools.	**03**
	(b)	Explain Fault tree analysis [FTA].	**04**
	(c)	Explain basic concepts, scope and implantation barriers of ISO 14000	**07**
		OR	
Q.4	**(a)**	Define following: (1) Quality (2) TQM (3) Poka yoke.	**03**
	(b)	What are the Reliability Parameters?	**04**
	(c)	Explain the bathtub curve in terms of reliability.	**07**
Q.5	**(a)**	List out various steps of Experimental design.	**03**
	(b)	Discuss about Taguchi approach in context to DOE	**04**
	(c)	Define DOE and enlist the components of DOE. Discuss Taguchi Quality Loss Function.	**07**
		OR	
Q.5	**(a)**	Define: Skewness and Kurtosis of life dispersion	**03**
	(b)	Describe concept of Concurrent Engineering.	**04**
	(c)	List out 7 new management tools and explain any five in detail.	**07**

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Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2024

Subject Code:3171929 Date:19-11-2024

Subject Name: Quality and Reliability 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)**	Differentiate inspection and quality control.	**03**
	(b)	"Quality products make a significant impact on revenues in the long run." Justify it.	**04**
	(c)	What do you mean by TQM? Also discuss principles of TQM.	**07**
Q.2	**(a)**	What is the importance of DOE?	**03**
	(b)	Define and discuss Kaizen.	**04**
	(c)	Explain seven new quality improvement tools.	**07**
		OR	
	(c)	Discuss the role of 5S in quality improvements in manufacturing sectors.	**07**
Q.3	**(a)**	Explain the process of operation of quality circle.	**03**
	(b)	Discuss Taguchi Loss Function.	**04**
	(c)	What do you understand by the robust design? How Taguchi techniques help achieving robust design of a product?	**07**
		OR	
Q.3	**(a)**	Define quality circle. What are the objectives of the quality circles?	**03**
	(b)	Explain the stages of DOE.	**04**
	(c)	Explain PDCA cycle in details.	**07**
Q.4	**(a)**	What is the aim of Concurrent engineering?	**03**
	(b)	What is Kanban system? What are the major benefits of Kanban system?	**04**
	(c)	What is six-sigma? Explain the relevance of six-sigma concept in achieving quality output in a process.	**07**
		OR	
Q.4	**(a)**	What is the need of ISO 9000?	**03**
	(b)	Define and discuss TPM.	**04**
	(c)	As natural resources become scare, discuss the role of ISO 14000 in promoting good environmental practices.	**07**
Q.5	**(a)**	What is reliability engineering? Explain the importance of reliability engineering.	**03**
	(b)	What do you mean by Lean manufacturing? Discuss the wastes and advantages of Lean manufacturing.	**04**
	(c)	What is Business Process Reengineering? What are the principles and advantages of Business Process Reengineering?	**07**
		OR	
Q.5	**(a)**	What is reliability and failure?	**03**
	(b)	Explain field reliability.	**04**
	(c)	Define MTBF and MTTR, and explain their significance in reliability calculations.	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171929 Date:01-12-2023

Subject Name: Quality and Reliability 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)**	How Juran, Deming and Crosby define Quality?	**03**
	(b)	Enlist the dimensions of Quality and explain any three dimensions of Quality in detail.	**04**
	(c)	Explain in brief house of quality – Product Planning matrix with suitable example.	**07**
Q.2	**(a)**	Describe 80/20 rule of Pareto diagram in detail.	**03**
	(b)	Illustrate the purpose of implementation of ISO 14000 in industries for India.	**04**
	(c)	Explain how FMEA helps in ensuring quality of a product. Draw a typical format of FMEA and explain the influence of RPN number in FMEA.	**07**
		OR	
	(c)	What is Total Employee involvement? How leader can improve the total employee involvement?	**07**
Q.3	**(a)**	Enlist the steps of Experimental design process.	**03**
	(b)	Why Poka-Yoke is known as error-proofing techniques?	**04**
	(c)	Briefly explain Toyota's seven deadly wastes.	**07**
		OR	
Q.3	**(a)**	What is Design of Experiments (DOE)? Enlist the types of Experimental Design.	**03**
	(b)	What is fishbone diagram? Construct fishbone diagram for poor mileage of two-wheeler.	**04**
	(c)	Explain briefly seven principles of JIT in detail.	**07**
Q.4	**(a)**	Briefly explain Autonomous Maintenance?	**03**
	(b)	Explain the Cost of Quality in detail.	**04**
	(c)	Explain Lean manufacturing and World class manufacturing in detail.	**07**
		OR	
Q.4	**(a)**	Discuss the differences between a traditional push system and a JIT demand-pull system.	**03**
	(b)	Illustrate Agile manufacturing with suitable example.	**04**
	(c)	Briefly explain the concept of Six sigma with its advantages and limitations.	**07**
Q.5	**(a)**	Define Maintainability and availability and compare it with reliability.	**03**
	(b)	Define the terms in context of reliability 1) MTTF 2) Reliability function 3) Failure rate 4) Active redundancy	**04**
	(c)	What is inspection and repair availability model? Explain a case for it.	**07**

OR

Q.5	**(a)**	Enlist types of Reliability and explain any three.	**03**
	(b)	Derive equation for hazard rate function using reliability, probability density function and cumulative distribution function.	**04**
	(c)	What are the four types of benchmarking? How it is useful in industries?	**07**

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Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3171929 Date:16-01-2023

Subject Name:Quality and Reliability 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)**	Discuss Just in Time Concept.	**03**
	(b)	Explain PDCA cycle.	**04**
	(c)	Define QFD and Discuss house of quality-product planning matrix.	**07**
Q.2	**(a)**	Define following: (1) Parameter Design (2)System Design (3) Tolerance Design	**03**
	(b)	Discuss various Quality costs.	**04**
	(c)	Explain basic concepts, scope and implantation barriers of ISO 14000	**07**
		OR	
	(c)	What is the role of ISO 14000 in managing good environmental practices.	**07**
Q.3	**(a)**	Define following: (1) Quality (2) TQM (3) Poka yoke.	**03**
	(b)	Discuss the contribution of any one of the Quality Gurus.	**04**
	(c)	Define DOE and enlist the components of DOE. Discuss Taguchi Quality Loss Function.	**07**
		OR	
Q.3	**(a)**	What is the difference between General Maintenance and Total Productive Maintenance?	**03**
	(b)	Explain the concept of 5S.	**04**
	(c)	Explain Pre-requisites of JIT. Also, Discuss the Elements of JIT	**07**
Q.4	**(a)**	Explain briefly Bench Marking.	**03**
	(b)	Discuss seven basic types of waste.	**04**
	(c)	Discuss about the basic 7 Quality Control tools.	**07**
		OR	
Q.4	**(a)**	Define Zero defects. Discuss various steps in implementing Zero defects.	**03**
	(b)	How Taguchi Techniques helps in achieving robust design of a product?	**04**
	(c)	Define FMEA. Draw a typical format of FMEA and explain its elements in brief	**07**
Q.5	**(a)**	What is Quality Circle? Explain its role in industry.	**03**
	(b)	Give any Four definitions of Quality.	**04**
	(c)	What is world class manufacturing? Explain.	**07**
		OR	
Q.5	**(a)**	Describe the concept of Kaizen.	**03**
	(b)	Explain any two TQM models.	**04**
	(c)	List various tools and techniques of KAIZEN. Also discuss any two of them.	**07**

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