

GUJARAT TECHNOLOGICAL UNIVERSITY**BE- SEMESTER-VII EXAMINATION – WINTER 2025****Subject Code: 3172013****Date:13-11-2025****Subject Name: Quality Assurance and Reliability****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) Define the term Quality.	03
(b) Explain any two types of sampling.	04
(c) Explain the concept of KAIZEN. Give advantages and application.	07
Q.2 (a) Explain characteristics of p charts and c charts.	03
(b) Define six sigma.	04
(c) Explain PDCA cycle in details with suitable example.	07
OR	
(c) Explain DMAIC approach for Six Sigma with suitable examples.	07
Q.3 (a) List the benefits of ISO.	03
(b) Briefly discuss Poka – Yoke.	04
(c) Define Just In Time. Give Advantages, Limitation And Application JIT.	07
OR	
Q.3 (a) Define the following terms: Mean Time To Failure (MTTF) and Mean Time Between Failure (MTBF).	03
(b) What are the characteristics and uses of normal distribution curve?	04
(c) Define Prevention, Appraisal, Internal failure and External failure terms related to the cost of quality.	07
Q.4 (a) What is Concurrent Engineering?	03
(b) Define Prevention cost and Appraisal cost of quality.	04
(c) Explain Deming's 14 points philosophy of TQM.	07
OR	
Q.4 (a) List the application of Bathtub Curve.	03
(b) Explain Element Redundancy and Unit redundancy.	04
(c) Define DOE and enlist the components of DOE. Discuss Taguchi Quality Loss Function.	07

- Q.5 (a)** Define: Failure rate, Failure density. **03**
- (b)** Explain Bayes theorem with suitable example. **04**
- (c)** In a company manufacturing cricket ball, the quality controller inspects the balls and classifies them as defective or non-defective on the basis of certain defects. The company manager wants to maintain the process so that an average of not more than 5 percent of the output is defective. Suggest a suitable control chart for this purpose. If the company can work with a sample of size 500, calculate the center line and control limits for this chart. **07**

OR

- Q.5 (a)** What are Quality circles? State its function. **03**
- (b)** Define Zero defects. Discuss various steps in implementing Zero defects. **04**
- (c)** Define FMEA. Draw a typical format of FMEA and explain its elements in brief **07**
