

# GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VIII(NEW) EXAMINATION – SUMMER 2019

**Subject Code:2182003**
**Date:13/05/2019**
**Subject Name:Quality Assurance & 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.

- Q.1** (a) Define: Quality, Quality Control, and Total Quality Management. **03**  
 (b) Evaluate : **04**  
     1. 'Quality is a relative term.'  
     2. 'Sampling is not a full proof exercise.'  
 (c) Explain Deming's 14 point philosophy of TQM **07**
- Q.2** (a) Differentiate between Quality Control and Quality Assurance **03**  
 (b) Explain DMAIC approach of 6sigma. **04**  
 (c) Explain the procedure for getting ISO9001 certification, along with the three essential audits. **07**
- OR**
- (c) Define sampling technique of inspection. What are different sampling techniques? What are the benefits using sampling technique? **07**
- Q.3** (a) Explain the importance of Quality Circle **03**  
 (b) Explain the Pareto principle with a suitable example. **04**  
 (c) Explain the baye's theorem with an appropriate example. **07**
- OR**
- Q.3** (a) Enumerate your views on Process capability and specified tolerances with sketches. **03**  
 (b) Explain any two Quality control tools. **04**  
 (c) Explain cost of prevention and cost of appraisal in detail with the help of relevant examples. **07**
- Q.4** (a) Explain Just in Time, Zero Inventory. **03**  
 (b) Evaluate : **04**  
     1. A number of Quality characteristics can be plotted using a p chart.  
     2.  $\bar{X}$  and R chart is less sensitive as compared to a p chart and can be used effectively for the improvement of quality.  
 (c) Differentiate between variable & attribute type of data with appropriate examples. Also describe the concept of variation in the context of manufacturing. **07**
- OR**
- Q.4** (a) Draw and brief about Operating Characteristics (OC) curve along with Producer's risk and Consumer's risk. **03**  
 (b) Draw a cause and effect diagram for reduced production rate in a manufacturing firm. **04**  
 (c) The functioning of a strategic experiment is monitored continuously by two observation stations, A and B, functioning independently. It is necessary that at least one of them function satisfactorily to monitor the progress of the experiment. Each of these observation stations receives power supply from two independent sources connected in parallel. A receives power from C and D, and B receives from E and F. For each observation station, the power from any one source is sufficient for operation. Draw the block diagram. Assume suitable values of reliability of each element and calculate the reliability for the system. **07**

- Q.5 (a) Explain the curve of hazard rate vs time with three clear zones on it. **03**  
(b) Explain the characteristics of p chart and np chart. **04**  
(c) Explain: MTTF, MTBF. **07**

**OR**

- Q.5 (a) Explain the Kolmogorov's Axioms. **03**  
(b) Define Reliability. What are the factors affecting reliability. Explain reliability in series and reliability in parallel **04**  
(c) What do you mean by redundancy? Explain various types of redundancies with graph. Show the best redundancy with suitable example. **07**

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