

**B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED MANUFACTURING) /
B.Tech. AEROSPACE ENGINEERING (BTAE)**

Term-End Examination

00203

June, 2017

BME-007(S) : QUALITY ENGINEERING

Time : 3 hours

Maximum Marks : 70

Note : *Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) Define the term 'Quality Control'. Differentiate between inspection and quality control.
- (b) Discuss the factors that ensure conformance of product to design specification. $2 \times 5 = 10$
2. (a) What is PDCA cycle ? Discuss its various stages.
- (b) Explain the significance of Risk Priority Number (RPN). What is the follow-up action after the RPN is determined ? $2 \times 5 = 10$

3. (a) What is Quality Audit ? Name and briefly describe the various types of quality audits.
- (b) List down the major benefits of implementing ISO 9000. $2 \times 5 = 10$
4. (a) Discuss the various types of quality costs. What kind of quality costs should a firm be more concerned with ?
- (b) A component has MTBF = 100 hours and MTTR = 20 hours with both failure and repair distributions exponential. Find the availability and unavailability of the component after a long time. $2 \times 5 = 10$
5. (a) Define the terms :
- (i) Failure rate, and
- (ii) Reliability.
- How will these parameters vary with time in a typical failure-data analysis ?
- (b) Calculate the system reliability for the units connected as shown in Figure 1.

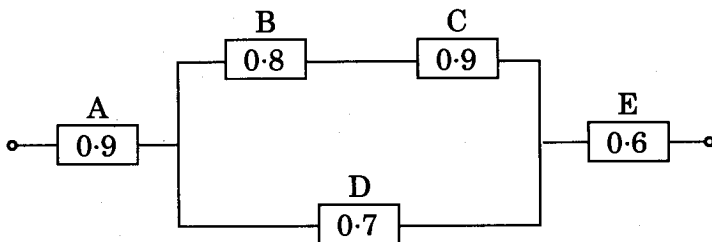


Figure 1

$2 \times 5 = 10$

6. (a) Determine the S/N ratio for a process that has an average temperature of 35°C and a sample standard deviation of 5°C for 7 observations.
- (b) The price of a product in two cities in ten shops selected at random is given in Table 1.

Table 1

S. No.	City X	City Y
1	55	61
2	54	63
3	47	56
4	59	63
5	51	56
6	61	63
7	57	59
8	54	56
9	64	44
10	58	61

Test whether the average prices can be said to be the same in the two cities.

(Take $\alpha = 0.05$ and for 18 degrees of freedom $t = 2.5$) $2 \times 5 = 10$

7. (a) List out and discuss the tools of Statistical Quality Control.
- (b) Describe the step-by-step procedure of Testing of Hypothesis. $2 \times 5 = 10$

8. (a) Discuss the contributions of Philip Crosby in TQM. Describe any three points for quality improvement.
- (b) Compare the Deming and Taguchi approaches towards quality improvement. $2 \times 5 = 10$

9. (a) What is benchmarking ? Describe the procedure to be followed in the benchmarking process.
- (b) Discuss the quality objectives of Failure Mode and Effects Analysis (FMEA). $2 \times 5 = 10$

10. Write short notes on any **four** of the following : $4 \times 2 \frac{1}{2} = 10$

- (a) Matrix Diagram
 - (b) Bathtub Curve
 - (c) Pareto Analysis
 - (d) ISO 14000
 - (e) Cause and Effect Analysis
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