

(Following Paper ID and Roll No. to be filled in your Answer Books)

PAPER ID : ME12

Roll No.

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**M. TECH. (Sem.II)**

**THEORY EXAMINATION 2015-16**

**QUALITY MANAGEMENT SYSTEMS**

Time : 3 Hours

Total Marks : 100

1. Attempt any two questions. [10×2]
- (a) What are the problems that are encountered during implementation of TQM and explain how would you tackle them?
- (b) What activities are to be performed for quality in manufacturing and in service sector?
- (c) What is cost of quality? Describe the categories and elements of quality costs in details. Explain the concepts of optimum cost of quality.
2. Attempt any two questions. [10×2]
- (a) A production manager at a light bulb plant has inspected the number of defective light bulbs in 10 random samples with 30 observations each. Following are the numbers of defective light bulbs found:

|               |   |   |   |   |   |   |   |   |   |    |
|---------------|---|---|---|---|---|---|---|---|---|----|
| Sample        | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| No. Defective | 1 | 3 | 3 | 1 | 0 | 5 | 1 | 1 | 1 | 1  |

Construct a three-sigma control chart ( $z = 3$ ) with this information.

- (b) What do you mean by process capability? What is the significance of normal curve in quality control? Explain.
- (c) Write short note on :
- (i) Quality control circle
  - (ii) Kaizen vs Innovation
  - (iii) Vision and Mission Statements

3. Attempt any two questions. [10×2]

- (a) Explain the deficiency of Taguchi's inner array outer array design? What is the alternative recommended by Montgomery? Describe in detail.
- (b) What is Signal to Noise Ratio (S/N)? Describe the concept of Taguchi's loss function with the help of an example.
- (c) The specification of steel shaft is  $6.40 \pm 0.10$  mm. the device sometimes fails when the shaft exceeds the specifications. When failure occurs, repair or replacement is necessary at the average cost of Rs. 95.
- (i) What is the loss coefficient K?
  - (ii) What is the loss function equation?
  - (iii) What is the loss at 6.45 mm?

4. Attempt any two questions. [10×2]
- (a) What is Six sigma methodology? Describe the DMAIC problem solving methodology.
  - (b) Describe how bench marking can be used to improve both efficiency and effectiveness. Explain Quality Functional Deployment.
  - (c) What is “Poka-Yoke”? Describe the zero quality control programme.

5. Attempt any two questions. [10×2]
- (a) Describe the ISO 9000 quality system. List five benefits that could be realized by implementing an ISO 9000 quality system.
  - (b) Which of the elements in ISO 9001 are similar to ISO 14001?
  - (c) Discuss the Audit objectives. What are the various types of Audits?

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