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**Question Paper Code : 80314**

M.B.A. DEGREE EXAMINATION, JANUARY 2014.

First Semester

BA 7104 — TOTAL QUALITY MANAGEMENT

(Regulation 2013)

Time : Three hours

Maximum : 100 marks

(Use of Statistical Tables are permitted)

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Show the expression of quality costs in mathematical terms.
2. What are the characteristics of quality vision statement?
3. Mention the importance of A.V. Feigenbaum's cycle time reduction methodology.
4. Define replication.
5. Define type II error.
6. How the upper and lower capability indices is fixed?
7. How is express failure mode critically number determined?
8. List out the sources for Benchmarking.
9. How to classify quality audit on the basis of area of coverage?
10. Define empowerment in quality aspects.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss in detail the dimensions of quality and its relevance in productivity efficiency. (16)

Or

- (b) Describe the cost of quality in detail with respect to the service based industry. (16)

12. (a) Customer tolerances for the height of a steering mechanism are  $1.5 \pm 0.0020$  m. For a product that just exceeds these limits, the cost to the customer for getting it fixed is \$50. Ten products are randomly selected and yield the following heights (in meters) : 1.53, 1.49, 1.50, 1.49, 1.48, 1.52, 1.54, 1.53, 1.51 and 1.52. Find the average loss per product item. The manufacturer decides to rework the height, prior to shipping the product, at a cost of \$3.00 per item. What should the manufacturer's tolerance be? (16)

Or

- (b) Discuss the structure and implementation of quality circle in an automobile industry. (16)
13. (a) Light bulbs are tested for their luminance, with the intensity of brightness desired to be within a certain range. Random samples of 5 bulbs are chosen from the output and their luminance values measured the sample mean  $\bar{X}$  and the standard deviation S are found. After 30 samples, the following summary information is obtained

$$\sum_{i=1}^{30} \bar{X}_i = 2550 \quad \sum_{i=1}^{30} S_i = 195 \quad \text{the specifications are } 90 \pm 15 \text{ lumens.}$$

- (i) Find the control limits for the  $\bar{X}$  and S charts. (3)
- (ii) Assuming that the process is in control, estimate the process mean and process std deviation. (2)
- (iii) Find the process capability indices  $C_p$  and  $C_{pk}$  and comment on their values. (3)
- (iv) If the target value is 90 lumens, find the capability index,  $C_{pm}$ . (4)
- (v) What proportion of the output is non conforming, assuming a normal distribution of the quality characteristics? (4)

Or

- (b) For the system shown in the figure 1, determine the system reliability for 2000 hour of operation, and find the MTTF. Assume that all 3 components have an identical time-to-failure distribution that is exponential, with a constant failure rate of 0.0005/hour. What is the MTTF of each component? If it is desired for the system to have a MTTF of 4000 hour, what should the MTTF be for each component? (16)

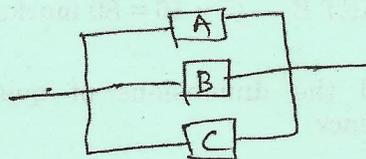


Figure 1 : Systems with components in parallel

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14. (a) "Creative solutions will emerge only from seven new management tools".  
Discuss. (16)

Or

- (b) How the process FMEA can be applied for software product development?  
Show in detail all the relevant steps in this case. (16)

15. (a) Explain the implementation of quality audit in an textile industry. (16)

Or

- (b) Describe the various motivational theory of individual employee in detail.  
(16)
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