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**R 3474**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Seventh Semester

(Regulation 2004)

Aeronautical Engineering

MG 1401 — TOTAL QUALITY MANAGEMENT

(Common to all branches except Biotechnology, Chemical Engineering,  
Polymer Technology, Textile Technology, Textile Technology  
(Fashion Technology), Textile Technology (Textile Chemistry) and  
Marine Engineering)

(Common to B.E. (Part-Time) Sixth Semester Regulation 2005)

Time : Three hours

Maximum : 100 marks

Use of statistical tables is permitted.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the equation that would quantify quality.
2. What is meant by vision statement? Write a sample one-sentence vision statement.
3. Draw the figure to depict customer satisfaction model.
4. Expand 5S.
5. In a foundry, the castings manufactured are inspected with respect to the four defects namely, blow holes, core shift, honey combing and hot tear design. Design a check sheet to gather data on the total number of castings found defectives due to the respective above defects.
6. A spindle with specifications  $20 \pm 0.05$  mm was machined in a lathe. The standard deviation of the spindle machined was found to be 0.25 mm. Compute the capability index. State whether the machining process in the lathe is capable of meeting the specifications.

7. Indicate any two strengths and weaknesses of benchmarking technique.
8. If the specifications are  $10 \pm 2$  for a particular quality characteristic and the average repair cost is Rs. 200, determine the loss function. Determine the loss at  $y=11$ .
9. Draw the model of process based quality management system given in ISO 9001 : 2000.
10. Differentiate TS 16949 and ISO 14001 standards.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Indicate the dimensions of quality with examples. (8)
- (ii) Enumerate the duties of quality council. (8)

Or

- (b) Enumerate Deming's 14 points of management. (16)

12. (a) (i) Enumerate any eight actions that an organizations shall take to handle complaints. (8)
- (ii) Describe briefly any eight concepts to achieve a motivated workforce in an organization. (8)

Or

- (b) (i) Indicate any two items that can be measured under the following titles in an organization : (1) Human resources (2) Customers (3) Production (4) Research and Development. (8)
  - (ii) Describe briefly any eight criteria that need to be considered while developing performance measures in organizations. (8)
13. (a) Following table contains the data on the weight of a plastic component in grams. This component is manufactured using a plastic injection molding process. Mean and range charts are required to be established for this process. Determine the trial central line and control limits. Draw the mean and range charts and plot the values. State whether the process is

under statistical control. If not, assume that the deviation occurred due to assignable causes which are rectified now. Revise the central line and control limits. Draw the revised mean and range charts and plot the values. State whether the process is now under statistical control. (16)

Sample Number	Measurements			
	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>
1	6.35	6.40	6.32	6.37
2	6.46	6.37	6.36	6.41
3	6.34	6.40	6.34	6.36
4	6.69	6.64	6.68	6.59
5	6.38	6.34	6.44	6.40
6	6.41	6.40	6.29	6.34
7	6.38	6.44	6.28	6.58
8	6.35	6.41	6.37	6.38
9	6.56	6.55	6.45	6.48
10	6.38	6.40	6.45	6.37

Or

- (b) Describe the characteristics and applications of the following four new seven management tools (i) Affinity diagram (ii) Interrelationship diagram (iii) Matrix diagram (iv) Process decision program chart. (16)

14. (a) (i) Draw the general structure of 'House of Quality' and indicate the constituents in it. (8)
- (ii) Explain briefly the QFD process. (8)

Or

- (b) (i) What are the six major loss areas that are measured, tracked and measured in a TPM program? Indicate the method of measuring any two of these major losses. (8)
- (ii) List the four stages of FMEA and indicate the activities carried out under each stage. (8)

15. (a) Consider a company involved in testing the strengths of components. Currently 50 engineers are working in the company. Explain briefly the steps that the company should take to implement ISO 9001 : 2000 based quality system and obtain the certificate from a certifying agency. (16)

Or

- (b) (i) With the aid of a pyramidal diagram, describe the documentation hierarchy stipulated in ISO 14001 standard. (8)
- (ii) Enumerate any eight key organization benefits achievable on implementing ISO 14001 based system. (8)
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