

MEC612 2008 QUALITY ENGINEERING AND MANAGEMENT Test I

Time: 50 minutes

Max marks: 20

All questions carry 2 marks each, except where mentioned.

1. Explain Joseph M Juran's contributions to Quality Management.
2. Differentiate between Quality Control and Quality Assurance as defined by ISO9000:2000.
3. Explain the necessity of a Quality Management System.
4. What are the deadly diseases afflicting management, as identified by Deming?
5. Explain the concept and significance of prevention in TQM.
6. What does Deming mean, when he says "Drive out fear".
7. Explain Rule 3 in Deming's funnel expt with a real life example of the same.
8. A Bank samples 50 customers randomly everyday and the number of dissatisfied customers for the last 30 working days are given below. Identify a suitable Control Chart and determine Control Limits, recalculating them assuming assignable causes for points out of control. Chart need not be plotted.

Day	1	2	3	4	5	6	7	8	9	10
No of dissatisfied customers	0	1	0	2	4	3	2	1	3	2
Day	11	12	13	14	15	16	17	18	19	20
No of dissatisfied customers	0	5	4	2	0	3	7	2	2	3
Day	21	22	23	24	25	26	27	28	29	30
No of dissatisfied customers	2	5	2	4	4	3	0	1	2	0

(4 marks)

9. The inner diameter of three samples of a washer is measured every hour. The customer has specified 15 ± 0.1 mm. After 25 samples, $\sum_{i=1}^{25} R_i = 4.8$, $\sum_{i=1}^{25} \bar{X}_i = 362$. Calculate trial control limits for an average range chart.
10. The tensile strength of cotton yarn spun in a mill is a quality characteristic of concern. Two samples are taken every hour and tested. Determine 2.5 sigma control limits for the average strength of the 2 samples, if the population tensile strength is known to be 5MPa with standard deviation 0.5MPa.

SOLUTIONS TO NUMERICAL PROBLEMS:

8.

		Excluding 17
npbar	2.3	2.137931
n	50	50
pbar	0.046	0.042759
UCL	6.74385	6.429626
LCL	-2.14385	-2.15376

9.

D4	2.575
Rbar	0.192
UCL R	0.4944
LCL R	0
A2	1.023
xbarbar	14.48
UCL xbar	14.67642
LCL xbar	14.28358

10.

xbarbar	5
sigma	0.5
n	2
L	2.5
UCLxbar	5.883883
LCLxbar	4.116117