



Name :

Roll No. :

Invigilator's Signature :

**CS/B.TECH(ME/PE)/SEM-8/ME-821/2010
2010**

TOTAL QUALITY MANAGEMENT

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Poisson exponential table and Normal Distribution table will be supplied by the Institution.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) Internal failure consists of
 - a) Retesting
 - b) Reprocessing
 - c) Rework
 - d) all of these.
- ii) Assignable causes are the result of difference among
 - a) workers
 - b) machines
 - c) materials
 - d) all of these.
- iii) Poisson distribution is assumed in
 - a) P-chart
 - b) R-chart
 - c) U-chart
 - d) C-chart.

- 8375



viii) A process is being controlled by taking samples periodically and testing by GO-NOT-GO gauge. The control chart used is

- a) X- and R-charts b) P-chart
 - c) C-chart d) U-chart.
- ix) Quality circle
- a) is the boundary beyond which product quality can be improved
 - b) brings better human relations with top management in their combined commitment to quality
 - c) is essential to get ISO 9000 series certification
 - d) all of these.
- x) A process is said to be under control if there are
- a) only chance causes
 - b) only assignable causes
 - c) both (a) and (b)
 - d) none of these.



GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. "Quality is a new competitive weapon." Justify the statement.
3. Define the terms 'quality of design,' 'quality of conformance' and 'quality of performance'.
4. Distinguish between variable and attribute data. What types of control charts are used for each ?
5. Explain Deming's P-D-C-A cycle.
6. What do you mean by ISO ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7.
 - a) Define Quality Function Deployment (QFD).
 - b) What are the benefits of QFD ?
 - c) Explain the various steps in construction of the QFD house of quality. $2 + 5 + 8$



8. a) How is the concept of Inspection transformed to TQM philosophy ?
- b) Explain the spiral progress of Quality functions.
- c) How to manage Quality ? 5 + 5 + 5
9. a) Explain Taguchi's Quality Control policy.
- b) Ten castings were inspected in order to locate defects in them. Every casting was found to contain certain number of defects as given below. It is required to plot a C-chart and draw the conclusions. (Refer to the Poisson exponential table)

<i>Castings</i>	<i>No. of defects found on inspections (c)</i>
1	2
2	4
3	1
4	5
5	5
6	6
7	3
8	4
9	0
10	7
Total = 10	37

7 + 8



10. a) Explain acceptance sampling.
- b) The lot size N is 2000 in a certain AOQL inspection procedure. The desired AOQL of 2% can be obtained with any one of the three sampling plans. These are :
- i) $n = 65, c = 2$
 - ii) $n = 41, c = 1$ and
 - iii) $n = 18, c = 9$.

If a large number of lots 0.3% defective are submitted for acceptance, what will be the average number of units inspected per lot under each of these three sampling plans ? 5 + 10

11. a) Explain the concept of optimum cost of conformance.
- b) A fair percentage of a certain product requires costly rework operations to change a certain quality characteristic after the product has been rejected by the manufacturer's 100 per cent final inspection. Rework is possible whenever the value of this quality characteristic falls above the upper specification limit. If the value falls below the lower specification limit, the product must be scrapped. $\bar{X}$ -bar and R values are computed for 50 subgroups of 5 each with samples taken from production every 2 hr. The specification requirements for the measured quality are 119 ± 10 and σ of 5. On the assumption that the quality characteristic follows normal distribution, approximately ? what percentage of defective product is being produced ? How much of this can be reworked ? (Refer to the Normal Distribution table) 5 + 10



12. Write short notes on the following :

- a) KAIZEN 5
- b) POKA-YOKE 5
- c) The various quality cost and its measurement. 5

=====