Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CHE)/SEM-8/CHE-804E/2013

2013

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.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) When a process is considered capable of producing a product without defects within specification limits, the process capability index (Cp), statistically corresponds to

   a) > 1.0 b) < 1

   c) 1 d) 0.

   ii) In relation to quality, Kaizen is the word used to mean

   a) Just in time

   b) Continuous improvement

   c) Systematic process

   d) Random sampling.

iii) The 95% confidence interval means the following % level of significance

a) 5 b) – 5

c) 100 d) 0.

iv) In total quality management of an organisation, a Run Chart focuses

a) more on the acceptable limits of a process

b) more on time pattern in the variation of a process

c) on the customers' specification limit

d) on the consumer's risk.

v) The term "ISO" in quality management refers to

a) quality system implementation in an organisation

b) quality control & measurement in a manufacturing or service organisation

c) implementation of statistical quality control techniques

d) building of quality standards in the products & services of the organisation.

vi) In drawing a quality control chart for number of defectives (attribute), the control limits are computed based on

a) Gaussion distribution

b) chi-square distribution

c) Poisson distribution

d) binomial distribution.

vii) Six Sigma process capability corresponds to defects per million of the magnitude

a) 5 b) 3.4

c) 266 d) 6.

viii) It is the only resources which do not depreciate over a period of time

a) raw materials resources

b) equipments & machineries

c) the human resources

d) energy resources.

ix) Which of the following is variable chart ?

a) u chart b) np-chart

c) R-chart d) c-chart.

x) When the process capability is more than the specified tolerance, then the rejections are

a) Less b) High

c) Very less d) Nil.

xi) Pareto analysis is a statistical technique in decision making that is used for

a) selection of a limited number of tasks that produce significant overall effect

b) overall examination of the total process for fault finding

c) a failure mode analysis

d) fault tree analysis.

xii) The concept of total quality management includes

a) involvement of working personnel only

b) involvement of top management only

c) involvement of the customers & vendors

d) all of these.

xiii) Which set of 'Three Ps' of quality in a business is appropriate ?

a) Power, Process & Programme

b) People, Product & Process

c) Process, Probability & Progress

d) Processs, Product & Parameter.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Enumerate 7-S principles of continuous quality improvement cycle.

3. What is the meaning of the term 'Kaizen' in Total Quality Management ?

4. Explain the implications of continuous improvement with the help of Deming's wheel in terms of PDCA cycle.

5. It has been decided to sample 100 items at random from each large batch and to reject the batch if more than 2 defectives are found. The acceptable quality level is 1% and the unacceptable quality level is 5%. Find the Producer's and Consumer's risks.

6. What are the differences between manufacturing and service organizations in regard to quality activities of the organisations ?

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What are the different quality standards known in the industries/service sectors ? 2

   b) What does ISO 9000 standards stand for ? 3

   c) Mention a few important standards with their scope of implementation areas under the family of ISO 9000. 5

   d) What are the activities involved in implementing ISO 9000 quality system ? 5

8. a) What is 'Acceptance Sampling ? 5

   b) What are the different kinds of "Lot Acceptance sampling Plans' (LASP) practiced generally ? 10

9. a) To derive the following two formulae for the binomial distribution : $\mu = np$, When n = no. of simple trails and p is the probability of success. 9

   b) How is process capability expressed and measured ? 6

10. Calculate parameters and draw the control chart for number of rejects (*np*) during the inspection in drop-hammer departmnet of sheet-metal part in a workshop as per the following inspection output.

Production order number	Lot size '*n*'	Number of rejects '*r*'
1	200	23
2	200	15
3	200	17
4	200	15
5	200	41
6	200	0
7	200	25
8	200	31
9	200	29
10	200	0
11	200	8
12	200	16

11. Write short notes on any *three* of the following : 3 × 5

a) Fish-bone diagram/Ishikawa diagram

b) SWOT analysis

c) Producer's risk & Consumers' risk

d) Operating Characteristic Curve

e) LTPD & AQL.