Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH(CT)/SEM-7/HU(CT)-702/2011-12

2011

QUALITY ASSURANCE

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 the following : 10 × 1 = 10

i) The temperature in a storage location is logged once every 30 minutes. The control chart that is appropriate for displaying these values is

a) x-bar and R

b) individual and moving range

c) p-chart

d) run chart.

ii) 5-Why Analysis is for

a) continuous improvement

b) customer satisfaction

c) finding out root causes

d) all of these.

iii) Kaizen was introduced by

a) Juran b) Ishikawa

c) Crossby d) Deming.

iv) An experiment has four factors with two different levels each. The experiment has eight runs. The design is called

a) Full factorial design b) Half factorial design

c) Interaction d) none of these.

v) Non-conforming products mean

a) rejected products

b) not meeting the specifications

c) both of these

d) none of these.

vi) Six sigma was introduced at

a) Toyota b) General Electric Co.

c) Motorola d) Nissan.

vii) One company manufacturing rotten eggs continuously can get ISO-9001 certification.

a) No b) Ye

c) Can't say d) Sometimes.

viii) When LSL less than X-bar - 3σ, then

a) there is a less possiblity of rejection

b) the process is generating high rejection

c) the process is balanced

d) all of these.

ix) One of the advantage of Kanban system is
   a) In-process rejection is reduced
   b) Consistency in output quality
   c) Level of in-process inventory is reduced
   d) Problem is identified easily.

x) The name of the technical committee responsible for release & modification for ISO-9001 standard is
   a) TC 186 b) TC 180
   c) TC 176 d) TC 178.

GROUP – B

(Short Answer Type Questions)

Write short notes on any *three* of the following. 3 × 5 = 15

2. Total Quality Management.
3. Five 'S' and Five 'Why'
4. 7 QC tools
5. Cause and Effect diagram
6. Quality loop of an organization.

GROUP – C

(Long Answer Type Questions)

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

7. Discuss different elements of Quality costs. Show graphically optimum cost of quality. Explain the steps to be followed when non-conforming products occur in the process. 7 + 4 + 4
8. What do you mean by process capability ? When do you need to know capability of a process ? Define 'Accuracy' & 'Precision'. Explain with the diagram the following situations :
   i) Accurate and precise process
   ii) Inaccurate but imprecise process
   iii) Inaccurate but precise process
   iv) Accurate but imprecise process. 1 + 2 + 2 + 10

9. In what way do ISI and ISO-9000 differ ? Discuss different types of quality characteristics with their advantages & disadvantages. Make a Pareto diagram with the following defects occurred during processing of a Translucent Polycrystalline Alumina Ceramics :

   i) Crack = 12%
   ii) Spot = 8%
   iii) Warpage = 4%
   iv) Low transmittance = 3%
   v) Bad handling =1·5%
   vi) Others = 2%. 3 + 6 + 6

10. Explain the actions to be taken with diagram when —

   i) process capability is smaller than specified tolerance.
   ii) process capability is equal to specified tolerance.
   iii) process capability is more than the specified tolerance.

   Following table provides data regarding six processes. Calculate C_P and C_{PK} indices for the processes :

Process	*USL*	*LSL*	*Mean*	*Standard deviation*	C_P	C_{PK}
A	2·64	1·98	2·25	0·10		
B	116·00	104·00	111·50	2·54		
C	520·00	505·00	511·00	2·50		
D	4·50	4·23	4·38	0·05		
E	12·60	12·00	12·30	0·125		
F	8·43	8·22	8·31	0·05		

   Now, identify

   i) which process is most capable.
   ii) which is the least capable process.
   iii) which is the most accurate process.
   iv) which is the least accurate process. 6 + 9