Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH (CT)/SEM-7/HU (CT)-702/2012-13

2012

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 : $10 \times 1 = 10$

i) ABC Analysis is related to

a) Marketing Management

b) Materials Management

c) Production Management

d) Financial Management.

ii) JIT is related to

a) Quality control b) Maintenance

c) Inventory control d) HR.

iii) EOQ is used in

a) Human Resource Management

b) Materials Management

c) Energy Management

d) Quality Management.

iv) A team wants a technique for determining and displaying priorities based on frequency of various defect types. They should use

a) written and diagrammed work instructions

b) cause and effect diagrams

c) Pareto chart

d) Matrix diagram.

v) Accurate process means

a) closeness between target and average

b) wide spread of values

c) narrow spread of values

d) none of these.

vi) A team wants a technique for obtaining a large number of possible reasons for excess variation in a dimension. They should use

a) Pareto diagram

b) Gantt chart

c) Brain Storming

d) PDCA cycle.

vii) C_{PK} index greater than 1 means

a) no non-conformity

b) there may be non-conformity

c) large non-conformity

d) none of these.

viii) Histogram helps us to know

a) vital few from trivial many

b) voice of customers

c) shape, centering and spread of data distribution

d) none of these.

ix) Standard deviation is the spread from

a) average b) median

c) mode d) none of these.

x) Product is checked with 'GO' & 'NOGO' gauges data which is generated, falls under

a) attribute

b) variables

c) both (a) and (b)

d) none of these.

GROUP – B

(Short Answer Type Questions)

Write short notes on any *three* of the following.

3 × 5 = 15

2. Brain Storming.

3. Explain six sigma with example.

4. Function of Quality loop of an organisation.

5. Documentation Track of ISO9001 and Handling of non-conforming products.

GROUP – C

(Long Answer Type Questions)

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

6. Give two definitions of quality. Explain with suitable example stated and implied needs. Draw a run chart showing UCL, LCL, USL & LSL. Why two-tier layers are needed ? Write the steps of continual improvement. Draw a Pareto diagram with the following information :

   Pin holes 2%, Warpage — 1·5%, Bad Handing — 0·8%, Dunting — 2·5%, Yellow core — 4·5%, Crack — 7%, others — 0·5%. 2 + 3 + 2 + 8

7. Differentiate between chance and assignable causes with suitable examples. Discuss different types of quality characteristics and their advantages and disadvantages. Show graphically (run-chart) situations when process under the influence of chance causes and under the influence of assignable causes. We say that when C_p is greater than 1, process is capable but there is case that process is not capable but C_p is greater than 1. Explain it with suitable diagram. 3 + 4 + 2 + 6

8. What do you mean by statistical control ? When you need to study capability of a process ? Define accuracy and Precision. Draw normal distribution curve and show the position of LSL, USL, X bar-3σ and X bar +3σ in a situation when USL-LSL > 6σ. 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 + 3 + 3 + 8

9. Write the equation for standard deviation for samples. 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 process. Calculate C_p and C_{pK} indices for the processes and answer the below mentioned questions :

Process	***USL***	***LSL***	***Mean***	***Standard***	C_p	C_{pK}
A	525·00	510·00	516·00	2·50		
B	112·00	100·00	107·00	2·50		
C	12·80	12·20	12·50	0·125		
D	2·66	2·00	2·27	0·10		
E	4·52	4·25	4·40	0·05		
F	8·45	8·24	8·33	0·05		

i) Which of the six processes is most capable ?

ii) Which is the least capable among the processes ?

iii) Which is the most accurate process ?

iv) Which is the least accurate process ? 1 + 6 + 8