2012

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) Statistical quality control approach was introduced in Japan by

a) Dr. Edward Deming b) Dr. K. Shikawa

c) Joseph Juran d) Philip Corby.

ii) The length of time that the product can be used before it fails is called

a) availability b) reliability

c) maintainability d) all of these.

iii) In Deming Wheel (*P-D-C-A*) *A* indicates the term

a) Activity b) Act

c) Addition d) none of these.

iv) How to reduce the cost of quality ?

a) By increasing the degree of conformance

b) By decreasing cost of failure

c) Both (a) and (b)

d) None of these.

v) The principle of 'Vital few of Trivial many' is used in

a) cause and effect diagram

b) Pareto diagram

c) brainstorming

d) none of these.

vi) Risk of rejecting the lots of quality better than or equal to the specified AQL is called

a) consumer risk

b) producer risk

c) operating characteristic curve

d) reliability factor.

vii) The sensibility of *p*-chart to change in quality is

a) equal to that of rain chart

b) equal to that of *c*-chart

c) equal to a chart of average

d) equal to that of *u*-chart.

viii) The probability to that an item will perform a stated function satisfactorily for a stated time period under specified condition is

a) reliability b) quality

c) availability d) none of these.

ix) What is the most efficient measure of central tendency ?

a) Geometric mean b) Arithmetic mean

c) Harmonic mean d) Median.

x) Quality cost is best classified as

a) cost of inspection and test

b) direct, indirect and overhead cost

c) cost of prevention, appraisal and failure

d) unnecessary cost.

xi) Assignable causes are the result of difference among

a) workers b) machines

c) materials d) all of these.

xii) Normal distribution is assumed in

a) *P*-chart b) *R*-chart

c) *U*-chart d) *C*-chart.

GROUP – B

(Short Answer Type Questions)

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

2. Draw the flow process chart (material type) for the following sequence of operations : (assume suitable distance and time)

a) Steel plates are in store

b) Moved to gas cutting machine

c) Wait for cutting machine being set

d) Plates cut to size

e) Plates moved to machine shop

f) Inspection done before machining.

3. In a customer satisfaction survey at a local fast food restaurant, the following complaints were lodged : (nos. of complaints are in bracket)

a) Cold food (105)

b) Flimsy utensils (2)

c) Food tastes bad (10)

d) Salad not fresh (94)

e) Poor service (13)

f) Food too greasy (9)

g) Lack of courtesy (2)

h) Lack of cleanliness (25).

Draw a Pareto chart for the complaints.

4. Draw the operating characteristic (OC) curve for a single sampling plan. Indicate different zones in the curve.

5. What do you mean by (a) Producer's risk, (b) Consumer's risk, (c) Average outgoing quality ?

6. What are the benefits of an organization if it is adopting ISO 9001:2008 certification ?

GROUP – C

(Long Answer Type Questions)

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

7. a) What is process capability ratio ? 3

b) A process had mean X = 41·5 and standard deviation 0·92. If the upper satisfaction limit (USL) and lower specification limit (LSL) for the process are 47 and 39, calculate the process capability indices for the process. 8

c) Name the prominent quality gurus. What is Juran's quality trilogy ? 4

8. a) What is Statistical Process Control ? 2

b) What are the various types of Control charts ? 4

c) Determine the control limits for X and R charts if $\sum X = 357 \cdot 50$, $\sum R = 9 \cdot 90$, Number of subgroup = 20. It is given that $A_2 = 0 \cdot 18$, $D_3 = 0.41$, $D_4 = 1.59$, $d_2 = 3.735$. Also find process capability. 9

9. a) What is acceptance sampling ? What are the reasons for acceptance sampling ? 4

b) What is an operating characteristic (OC) curve ? 3

c) What is Six Sigma ? 2

d) Name and describe the various steps in the application of Six Sigma. 6

10. a) What is Quality Function Development (QFD) ? 2

b) What are the benefits of QFD ? 5

c) Using a schematic diagram, explain the various steps in construction of the QFD house of quality. 8

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

a) Kaizen

b) Taguchi's quality loss function

c) Quality characteristics

d) JIT concept and its implications

e) Process capability ratio.

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