LF-106

April-2014

B.Sc. Sem.-VI

CC-309 : Statistics

(Statistical Quality Control)

Time : 3 Hours] [**Max. Marks : 70**

Instructions : (1) **All** questions are compulsory.

(2) Each question carries equal marks.

(3) You can use scientific calculator.

1. (a) Give the objective, meaning, uses and historical background of statistical quality control.

OR

Discuss the causes of variation in quality.

(b) Write short note on theory of runs.

OR

Give the steps to determine whether the process is under control or not in general.

2. (a) Describe briefly the various steps in the construction of control charts for mean and range. Also discuss the significance of the joint study of these charts.

OR

Explain in detail operating characteristic curve for average chart.

(b) What do you understand by control chart for fraction defective ? Explain its construction, giving the theoretical distribution on which the control limits are based.

OR

Write short note on control chart for number of defects.

3. (a) (i) What do you mean by Acceptance Sampling Plan ? Give its introduction and also give basic requirements for any sampling inspection plan.

(ii) What is Single Sampling Plan for attribute ? Derive it.

OR

With reference to S.S.P. given by (100, 20, 1) lot fraction defective is 0.02, then find the probability of accepting the lot.

(b) Explain the following terms :

(i) A.Q.L. and L.T.P.D.

(ii) Producer's risk and Consumer's risk

(iii) A.O.Q. and A.O.Q.L.

OR

Explain :

(i) ASN, AOI, ATI

(ii) Advantages and disadvantages of S.S.P.

4. (a) Explain sampling plan for variables when LCL is specified and σ is known.

OR

Explain sampling plan for variables when UCL is specified and σ is unknown.

(b) Make comparison between sampling inspection plan for variables and sampling inspection plan for attributes.

OR

Which plan is better with respect to producer ? Answer with proper calculation :

Plant I : (100, 20, 1), AQL = 1%

Plan II : (1000, 100, 2), AQL = 1%

5. Write answers in brief :

(1) Give the names of two phases of S.Q.C. in any manufacturing unit.

(2) According to Schwartz, what is quality in S.Q.C. ?

(3) State the significance of using 3σ control limits.

(4) Define "High Spot" and "Low Spot" points.

(5) Give two points of the difference between variable chart and attribute chart.

(6) Give two examples of assignable causes of variation.

(7) Give two applications of C chart.

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