

This question paper contains 3 printed pages.

Your Roll No.

Sl. No. of Ques. Paper : 6724

HC

Unique Paper Code : 32371403

Name of Paper : Statistical Quality Control

Name of Course : B.Sc. (Hons.) Statistics

Semester : IV

Duration : 3 hours

Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

Attempt six questions in all.

Question No. 1 is compulsory.

Attempt four questions from Section A

and one question from Section B.

1. (a) Define SPC. Explain in brief the tools of SPC. . 5
- (b) What is the statistical justification for using the three sigma limits in the control charts irrespective of the actual probability distribution of the quality characteristic? 5

SECTION A

2. (a) Discuss and derive the construction of \bar{X} and s control charts for controlling process average and process variability, when population parameters are unknown. 61/2

P. T. O.

- (b) Discuss the concept of Process Capability Analysis. 61/2
3. (a) What are control charts for attributes? Derive control charts for controlling the proportion defectives when sample size is fixed, giving clearly the statistical concept used. 61/2
- (b) What are modified control limits? Explain how they are derived. Why is it required to construct modified control limits? 61/2
4. (a) Discuss the average quality protection approach to decide the sample size and acceptance number in respect of single sampling plan. 61/2
- (b) Define AOQ and AOQL. For a single sampling plan obtain an expression for AOQL. 61/2
5. (a) What is an OC curve? Obtain its expression in a Single Sampling Plan. 61/2
- (b) Describe the double sampling plan for attributes and obtain its probability of accepting a lot. 61/2
6. Distinguish between:
- (a) ASN and ATI
- (b) Incoming quality and Outgoing quality of a lot
- (c) A.Q.L and L.T.P.D. 4,41/2,41/2

SECTION B

7. (a) Describe Laspeyres' and Paasche's methods of price index numbers. Discuss the criteria required for the selection of base period. 61/2
- (b) Explain (i) Time reversal test and (ii) Factor reversal test in index numbers. In each case show one index number formula which (i) satisfies, (ii) does not satisfy the test. 61/2
8. (a) What is a Chain Index? Show that the chain indices are equal to the corresponding fixed base indices if the formula used satisfies the circular test. 61/2
- (b) Explain in brief (i) base shifting and (ii) deflating of index numbers. 61/2