2024
B.A./B.Sc.
Fourth Semester
CORE – 10
STATISTICS
Course Code: STC 4.31
(Statistical Quality Control)

Total Mark: 70 *Pass Mark: 28*
Time: 3 hours

Answer five *questions, taking* one *from each unit.*

UNIT–I

1. (a) Explain the term quality. What are the various meanings of quality relative to its use? 2+6=8
   (b) What do you understand by the term "Quality of Design"? Explain the factors affecting the quality of design. 2+4=6

2. (a) Discuss Deming's principles of quality. 8
   (b) Mention the steps required for ISO:9000 quality registration. 6

UNIT–II

3. (a) Explain the two causes of variations in quality. 5
   (b) Explain the basic principles underlying the control charts. 3
   (c) Explain 3-s control limits. How do you set the control limits for s-charts? 2+4=6

4. (a) What do you mean by assignable causes of variation? Give two examples. 2+2=4
   (b) Explain in brief the steps involved in $\bar{X}$ and R charts. 6
   (c) Write the applications of statistical quality control. 4

UNIT–III

5. (a) Why and when do you use a p-chart? Write its assumptions. 2+2=4
   (b) Formulate control limits for number of defectives. 5

(c) Distinguish between control charts for variables and control charts for attributes. 5

6. (a) Discuss control charts for u-chart. 5
   (b) What is a c-chart? Write its assumption. When do we use a c-chart? 2+2+2=6
   (c) Write the interpretation of number of defectives. 3

UNIT–IV

7. (a) Define lot formation. What are the symbols used in relation to sampling acceptance? 2+2=4
   (b) Explain the term consumer's risk and producer's risk. 2+2=4
   (c) Write note on average sample number and average amount of total inspection. 3+3=6

8. (a) What is single sampling plan? Explain with the use of a flow chart. 6
   (b) Explain the procedure for double sampling plan. Also, discuss the ASN and ATI for double sampling plan. 4+4=8

UNIT–V

9. (a) What is sequential probability ratio test (SPRT)? Explain the steps involved in carrying out an SPRT. 3+6=9
   (b) Determine the ASN function of sequential sampling plan. 5

10. (a) Discuss the five points on an OC curve for an SPRT. 7
    (b) Prove that $p_0 < s < p_1$. 7