April 2025
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) Define the term quality. Distinguish clearly between quality of a design and quality of conformance 2+5=7
   (b) Discuss about the seven point tools of statistical process control. 7

2. (a) Give a short historical perspective of ISO. 4
   (b) Write the name of three quality gurus. Briefly discuss the approaches and philosophy of any one of them in the field of quality improvement. 3+7=10

UNIT–II

3. (a) Explain what chance and assignable causes of variation in the quality of manufactured product are. 4
   (b) Explain control charts. Write a note on criteria for detecting lack of control in $\overline{X}$ and *R* chart. 4+6=10

4. (a) Explain clearly the basis and working of control charts for mean and range. 6
   (b) Explain the control limits of $\overline{X}$ and R chart. 8

UNIT–III

5. (a) How do you calculate control limits for a c-chart? Discuss the assumptions and approximations involved in this calculation. 5+4=9
   (b) What are the main control charts for attributes? 2
   (c) When should the control charts for number of defects be constructed? 3

6. (a) Differentiate between c-chart and p-chart. 4
   (b) Describe the control limits for d-chart. 5
   (c) Give some situations in which c-chart can be used. 5

UNIT–IV

7. (a) Write notes on acceptance quality level, lot tolerance percent defective, process average fraction defective, and consumer's risk. 3+3+3+3=12
   (b) Define single sampling inspection plan with illustration. 2

8. (a) How are *n* and *c* determined in case of a double sampling plan? 8
   (b) Obtain the OC, ASN and ATI of double sampling inspection plan. 6

UNIT–V

9. What do you understand by sequential sampling inspection plan? Describe the sequential probability ratio test (SPRT) along with the procedure. 7+7=14

10. (a) What is an ASN function? Write a note on ASN function of sequential sampling plan. Also, obtain the five points on the ASN curve of sequential sampling plan. 8
    (b) Write a note on the OC of sequential sampling plan and find five points on the OC curve of sequential sampling plan. 6
