



LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – STATISTICS

THIRD SEMESTER – APRIL 2025

PST 3503 – STATISTICAL QUALITY CONTROL



Date: 29-04-2025

Dept. No.

Max. : 100 Marks

Time: 09:00 AM - 12:00 PM

SECTION - A

Answer any FOUR questions.

(4X10 = 40)

1. Discuss the eight dimensions of quality.
2. Describe the various patterns in the control chart.
3. a) Discuss Producer's risk and Consumer's risk
b) Discuss the role of central limit theorem in control limits.
4. Discuss the use of Histogram, Stem and Leaf Plot, Pareto chart, Cause-and-effect diagram and Scatter diagram as a tool for process monitoring and process improvement.
5. Explain the need for Multivariate Control chart and construction of multivariate control charts by using Hotelling T^2 .
6. A process is in control with $\bar{X} = 100$ and $\bar{S} = 1.05$. The process specifications are 95 ± 10
a) Estimate the potential capability.
b) Estimate the actual capability.
7. Discuss OC-Curve, ASN, AOQ, AOQL and ATI in Acceptance Sampling for attributes.
8. Explain Six Sigma and key principles of Six Sigma.

SECTION - B

Answer any THREE Questions.

(3 X 20 = 60)

9. Briefly explain Deming's 14 points.
10. a) Discuss Operating Characteristic function with an example
b) Discuss the following Process Capability Ratios C_p , C_{pk} and C_{pm} in detail.
11. Write a detailed note on tabular CUSUM control charts.
12. Setup an EWMA control chart for the process mean with the target value
 $\mu = 10, \sigma = 1, \lambda = 0.1$ and $L = 2.7$ to the data given below and interpret the result.

i	1	2	3	4	5	6	7	8	9	10
x_i	9.45	7.99	9.29	11.66	12.16	10.18	8.08	11.46	9.2	10.34

13. Discuss Double Sampling Plan and Multisampling plan by Attributes in detail
14. Explain the DMAIC procedure in detail.

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