LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc., DEGREE EXAMINATION – STATISTICS

SIXTH SEMESTER – APRIL 2015

ST 6605/ST 6602 – STATISTICAL PROCESS CONTROL

Date : 25/04/2015   Dept. No.   Max. : 100 Marks
Time : 09:00-12:00

PART – A

Answer **ALL** questions: **(10x2=20 Marks)**

1. What do you understand by Statistical Process control?
2. Define Total Quality Management.
3. Draw a stem and leaf plot for the following data: 1.2, 1.3, 1.3, 1.5, 1.7, 1.8, 2.2, 2.6, 2.6, 3.5, 4.0.
4. What are the advantages of quantile plot?
5. What is the difference between process control and product control?
6. What are the applications of c-chart?
7. Define process capability analysis.
8. Explain CUSUM chart.
9. What is double sampling plan?
10. Explain the procedure of single sampling plan.

PART – B

Answer any **FIVE** questions: **(5x8=40 Marks)**

11. Explain basic principle of Total Quality Management.
12. Discuss statistical methods for quality improvement.
13. Describe the concept of Quantile (qq-plot) with an example.
14. Stating the assumptions clearly, derive the control limits for $\overline{X}$ and R charts.
15. Explain the method of construction of multiple sampling plans.
16. Explain the construction and interpretation of p-chart.
17. Obtain the OC and ATI curves of double sampling plan.
18. Distinguish between CUSUM chart and Shewhart control chart.

PART – C

Answer any **TWO** questions: **(2x20=40 Marks)**

19. (a) Discuss the implication of quality improvement.
    (b) Construct a p-chart of the following data on the number of defective pieces of an
        electronic device observed in samples of 200 pieces each:
        8, 6, 12, 5, 7, 6, 6, 8, 8, 9, 10, 8, 8, 6, 5, 7, 8, 7, 6, 4, 5, 5, 6, 4, 5.

20. (a) Compare c chart versus u chart.
    (b) Construct a c-chart for the following data based on 20 samples:
        2, 5, 3, 0, 2, 1, 2, 0, 2, 1, 2, 1, 0, 4, 1, 2, 3, 2, 3, 2.

21. (a) Explain how you would construct the V-mask for a CUSUM chart.
    (b) Write short notes on (i) Process capability analysis and (ii) Sequential sampling Plan.

22. (a) Explain the following: (i) Stem and leaf plot, and (ii) Box plot.
    (b) Explain the operation of a double sampling plan with $n_1 = 50$, $n_2 = 25$, $c_1 = 2$
        and $c_2 = 5$ with a flow chart.

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