# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **STATISTICS**

SIXTH SEMESTER – **NOVEMBER 2022**

**UST 6503 – STATISTICAL QUALITY CONTROL**

Date: 03-12-2022 Dept. No. Max. : 100 Marks

Time: 01:00 PM - 04:00 PM

## PART A

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

1. Define total quality management.
2. Point out any two uses of stem and leaf plot.
3. When do you use Histogram?
4. Define statistical process control.
5. Write the control limits for R chart.
6. Specify the purpose of p chart.
7. Write down the control limits of c chart.
8. Give the ways to represent cusums.
9. Define process capability analysis.
10. Write any two advantages of acceptance sampling.

## PAR- B

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

11. Write short notes on statistical methods for quality control and improvement.
12. Describe the dimensions of quality.
13. What are the benefits of statistical quality control?
14. Write about Box plot technique.
15. Discuss the stem and leaf plots with an example.
16. Explain the single sampling plan for attributes.
17. Write short notes on the CUSUM control chart.
18. A machine is set to deliver the packets of a given following weight. Ten samples of size five each were examined and the following results were obtained.

| Sample No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Mean | 43 | 49 | 37 | 44 | 45 | 37 | 51 | 46 | 43 | 47 |
| Range | 5 | 6 | 5 | 7 | 7 | 4 | 8 | 6 | 4 | 6 |

Calculate the values for the central line and the control limits for the mean chart and range chart. Comment on the state of control.

## PART - C

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

19. Explain Deming's 14 points.
20. a) What are the causes of variation in quality control? Explain. (10)
    b) Describe the procedure for the construction of the X bar and R chart. (10)

21. a) Construct c- chart for the following data. (10)

The number of defects observed on 20 electronic circuit boards is given below:

| S. No | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| No. of Defects | 5 | 2 | 1 | 0 | 3 | 4 | 6 | 4 | 2 | 1 |
| S. No | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| No. of Defects | 0 | 2 | 4 | 2 | 1 | 3 | 0 | 1 | 1 | 2 |

b) Food served at a restaurant should be between 39°C and 49°C when it is delivered to the customer. The process used to keep the food at the correct temperature has a process standard deviation of 2°C and the mean value for these temperatures is 40. What is the process capability index of the process? (10)

22. a) Write down the uses of process capability ratios. (10)

b) Explain the sequential sampling plan. (10)

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