LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

SIXTH SEMESTER – **APRIL 2023**

UST 6503 – STATISTICAL QUALITY CONTROL

Date: 05-05-2023 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

PART - A

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

1. Define quality and quality improvement.
2. What are the three major areas of quality improvement?
3. When do we use histogram?
4. What are the characteristics of a box plot?
5. Define chance cause.
6. Write the control limits for the mean chart.
7. What is the difference between the CUSUM and Shewhart charts?
8. Define process capability.
9. Write any two advantages of sampling.
10. Define a Sequential sampling plan.

PART - B

Answer any FIVE questions **(5 x 8=40 Marks)**

11. Briefly discuss on Total Quality Management.
12. Describe Deming philosophy.
13. Explain Quantile plot and its applications.
14. Write a short note on box plot.
15. Define the terms a) control limits b) specification limits c) natural tolerance limits
16. The following data give the number of defectives in 10 independent samples of varying sizes from a production process:

Sample No.	1	2	3	4	5	6	7	8	9	10
Sample Size	2000	1500	1400	1350	1250	1760	1875	1955	3125	1575
No. of defectives	425	430	216	341	225	322	280	306	337	305

Draw the control chart for fraction defective and comment on it.

17. Discuss the Cusum control chart for monitoring the process mean.
18. Explain single sampling plan for attributes.

PART - C

Answer any TWO questions **(2 x 20=40 Marks)**

19. Explain the major dimensions of product quality.
20. Describe in detail stem and leaf plot.
21. Construct a control chart for mean and the range for the following data on the basis of fuses, samples of 5 being taken every hour (each set of 5 has been arranged in ascending order of magnitude). Comment on whether the production seems to under control assuming that these are the first data. (for n = 4, $A_2 = 0.58,\ D_3 = 0,\ D_4 = 2.11$).

42	42	19	36	42	51	60	18	15	69	64	61
65	45	24	54	51	74	60	20	30	109	90	78
75	68	80	69	57	75	72	27	39	113	93	94
78	72	81	77	59	78	95	42	62	118	109	109
87	90	81	84	78	132	138	60	84	153	112	136

22. Elaborate on double sampling plan and general method of plotting OC curve of such a plan.

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