Registration Number:

Date & Session

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BENGALURU -27

B. Sc – V SEMESTER

SEMESTER EXAMINATION: OCTOBER 2022

(Examination conducted in December 2022)

ST 5218: Statistical Methods for Quality Management

Time: 2 ½ Hours **Max Marks: 70**

This paper contains TWO printed pages and THREE parts

PART-A

I Answer any FIVE from the following **3 * 5 = 15**

1. A) Write the modern definition of quality.
   B) What are the two aspects of fitness of use?
2. Explain any three dimensions of quality.
3. Explain the two types of variability with an example.
4. Differentiate between Natural tolerance limit and specification limit.
5. Derive the probability of non-conforming items when PCR and specification limits are known.
6. Define producer's risk and consumer's risk and mention the quality level associated with it.
7. Explain the algorithm of accepting or rejecting a lot in single sampling plan.

PART - B

II Answer any FIVE from the following **7 * 5 = 35**

8. Explain the seven tools of SQC.
9. A). What is six sigma? Explain any one methodology under six sigma.
   B) What are ISO and BIS? (5 + 2)
10. Derive OC function for $\bar{X}$ chart.
11. Derive control limits for $\bar{X}$ and R chart for standards known and unknown case.
12. A) Explain Average run length and derive the formula for the same.
    B) Mention the OC function for R chart. (5 + 2)
13. What is Process capability? Explain any three process capability indices.

14. A) What is double sampling plan? Write down the algorithm to reject or accept a lot in double sampling plan.

B) Write the advantages and disadvantages of double sampling plan. (5 + 2)

PART - C

III Answer any TWO from the following **10 * 2 = 20**

15. A) Explain the following.

i. Average sample number

ii. Average outgoing quality

iii. Average total inspection (2 + 2+ 3)

B) Mention the 3-σ control limits for U-chart. (3)

16. A) Differentiate between C-Chart and U-Chart with an example

B) What is p-chart? Derive the 3-σ control limits for p-chart with procedure. (3 + 7)

17. A) Derive OC function for Single sampling plan.

B) Differentiate between 100% inspection and Acceptance sampling. (7 + 3)

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