



Reg. No. :

Name :

V Semester B.Sc. Degree (CBCSS – OBE-Regular/Supplementary/Improvement) Examination, November 2022 (2019 Admission Onwards) CORE COURSE IN STATISTICS

5B08 STA : Statistical Quality Control and Operations Research

Time : 3 Hours

Max. Marks : 48

Instruction : Use of calculators and statistical tables are permitted.

PART – A

Answer all questions. Each question carries 1 mark. (6x1=6)

- 1. What is the limitation of graphical method of solving an LPP ?
2. Define a convex set.
3. What do you mean by degeneracy in Transportation Problem ?
4. When do you say that an Assignment Problem is unbalanced ?
5. What do you mean by 'Quality' of a product ?
6. Define Process Capability Limits.

PART – B

Answer any 7 questions. Each question carries 2 marks. (7x2=14)

- 7. What are slack and surplus variables ?
8. Define primal and dual LPPs.

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- 9. Write down the mathematical formulation of Transportation problem.
10. Express Assignment Problem in the form of an LPP.
11. Give the control limits of np-chart when :
a) Standards are known
b) Standards are unknown.
12. Differentiate between 'Defects' and 'Defectives' with examples.
13. What do you mean by Process control and Product control ?
14. Give the merits of Acceptance Sampling Plans.
15. What is the difference between Attribute Sampling Plan and Variable Sampling Plan ?

PART – C

Answer any 4 questions. Each question carries 4 marks. (4x4=16)

- 16. Give one example each for the situation of an LPP having
a) Unbounded solution
b) No feasible solution.
17. Solve the following LPP using graphical method
Maximize Z = 2x + 5y subject to
x + 4y ≤ 24, 3x + y ≤ 21, x + y ≤ 9, x, y ≥ 0.
18. Describe the procedure of North-West Corner Rule for finding initial solution of a Transportation Problem.
19. Describe the statistical basis in the construction of Control Charts.
20. Derive the control limits of a c-chart.
21. Define AQL, LTPD, AOQ and AOQL.



PART – D

Answer any 2 questions. Each question carries 6 marks. (2x6=12)

- 22. Explain the various steps involved in Simplex Method.
23. Solve the Assignment Problem for minimizing the cost as given in the following table.

Table with 5 columns (I, II, III, IV) and 4 rows (A, B, C, D) containing numerical values.

- 24. Describe the procedure of construction and interpretation of Mean Chart and Range Chart.
25. Give the various steps involved in a Single Sampling Plan. Derive the OC function and ATI for the Single Sampling Plan.