K23U 2385

Reg. No. : .....

Name : .....

V Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/ Improvement) Examination, November 2023
(2019 – 2021 Admissions)
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** carries **1** mark. **(6×1=6)**

1. What do you mean by the term 'optimization' in an LPP ?
2. When will you say that a solution is degenerate in an LPP ?
3. Write down the objective function of Transportation problem.
4. Give an example of assignable cause of variation in a production process.
5. Which distribution is commonly used in constructing control limits ?
6. Define Natural Tolerance Limits.

PART – B

Answer **any 7** questions. **Each** carries **2** marks. **(7×2=14)**

7. Define :
   i) Basic solution and
   ii) Basic feasible solution in an LPP.
8. Define :
   i) Surplus variable
   ii) Artificial variable in an LPP.
9. What is the need of constructing 'loop' in a transportation problem ?

P.T.O.

10. When will you say that an assignment problem is unbalanced ?
11. Give the control limits of x bar-chart when
    a) Standards are known
    b) Standards are unknown.
12. How Poisson distribution will be used to construct control limits for a c-chart ?
13. When will you construct attribute control charts ?
14. What is a rectifying inspection plan ?
15. Define OC function.

PART – C

Answer **any 4** questions. **Each** carries **4** marks. **(4×4=16)**

16. Give the various steps involved in graphical method of solving an LPP.
17. i) Define primal and dual LPP.
    ii) Give an example.
18. Describe the procedure of least cost method for finding initial solution of a transportation problem.
19. Outline the procedure of single sampling plan in SQC.
20. Give four situations where 100 percent inspection is to be adopted.
21. Define producer's risk, consumer's risk, AOQ and ASN.

PART – D

Answer **any 2** questions. **Each** carries **6** marks. **(2×6=12)**

22. Solve the following LPP using simplex method :

    Maximize $z = 50x + 60y$ such that $2x + y \leq 300$, $3x + 4y \leq 509$, $4x + 7y \leq 812$, $x \geq 0$, $y \geq 0$.
23. Give the various steps in Hungarian algorithm for solving assignment problem.
24. Describe the procedure of construction and interpretation of d chart.
25. Give atleast three advantages and disadvantages of acceptance sampling plan in SQC.

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