TB246653V

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Reg. No :.....

Name :.....

BACHELOR'S DEGREE (C.B.C.S) EXAMINATION, MARCH 2024

2021 ADMISSIONS REGULAR

SEMESTER VI - CORE COURSE B.Sc. Computer Applications

ST6B07B18 - Optimization Techniques

Time : 3 Hours **Maximum Marks : 80**

Part A

I. Answer any Ten questions. Each question carries 2 marks **(10x2=20)**

1. What is an Analogue model?
2. Define Operations Research
3. Give an example for mathematical model
4. Who formulated Simplex Method?
5. Explain Objective function and decision variables in LPP
6. Define the dual linear programming
7. What is the necessary and sufficient condition for the existence of a feasible solution for the transportation problem?
8. What is meant by non –degenerate basic feasible solution of a transportation problem
9. What is the objective of critical path analysis?
10. Explain the following terms in PERT/CPM i)Total Activity Time ii) Latest Time
11. What are the 2 major components of PERT/CPM network?
12. Write any 2 limitations of PERT model

Part B

II. Answer any Six questions. Each question carries 5 marks **(6x5=30)**

13. Write short note son physical models and symbolic models
14. Write short notes on Decision Variables, Objective Function, Constraints
15. Limitations of Linear Programming.
16. Give the Formulation of Dual Linear Programing Problem
17. Use the Graphical method to solve the following Linear Programing

    Minimize $Z=3x_1+2x_2$

    Subject to constrains $5x_1+x_2 \leq 10$

    $x_1+x_2 \leq 6$

    $x_1+4x_2 \leq 12$

    $x_1, x_2 \geq 0$

18. Solve the following transportation problem using least cost method

	D1	D2	D3	D4	Supply
S1	21	16	15	3	11
S2	17	18	14	23	13
S3	32	27	18	41	19

Demand	6	10	12	15	43

19. Explain in brief 3 methods of initial feasible solution for transportation problem
20. Explain various steps involved in Least cost method
21. What are the major limitations of a PERT model?

Part C

III. Answer any Two questions. Each question carries 15 marks **(2x15=30)**

22. **Use Big M method to solve the following LPP**

Minimize $7x_1+15x_2+20x_3$

Subject to the constraints

$$2x_1+4x_2+6x_3\geq 24$$

$$3x_1+9x_2+6x_3\geq 30$$

$$x_1,x_2,x_3\geq 0$$

23. Explain in detail the steps involved in i)North-west Corner method ii) Vogel's Approximation Method
24. Determine an initial feasible solution to the following transportation problem by i) Least Cost Method ii) North West Corner Method iii) Vogel's Approximation Method.

	D1	D2	D3	D4	Supply
S1	11	13	17	14	250
S2	16	18	14	10	300
S3	21	24	13	10	400
Demand	200	225	275	250	950

25. Explain in detail Critical Path Analysis