

QP CODE: 24000592

Reg No	:	
Name	:	

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, MARCH 2024

Sixth Semester

B.Sc Statistics Model I

CHOICE BASED CORE COURSE - ST6CBT01 - OPERATIONS RESEARCH

2017 Admission Onwards

A48BDCE9

Time: 3 Hours

Max. Marks : 80

Part A

Answer any **ten** questions.

Each question carries **2** marks.

- 1. What are the characteristics of a good model?
- 2. What is a Linear Programming Problem?
- 3. What is meant by optimal solution of an LPP?
- 4. Explain when two-phase method is used?
- 5. What is primal?
- 6. Describe briefly the method of obtaining the optimum solution of the primal from the final Simplex table of the dual.
- 7. How do you find out initial basic feasible solution for a transportation problem using North-West corner rule?
- 8. Write a short not on Vogel's approximation method.
- 9. What are net evaluations in in transportation problems?
- 10. What are the objectives of network analysis?
- 11. What are concurrent activities?
- 12. What is meant by independent float?

(10×2=20)

Part B

Answer any **six** questions. Each question carries **5** marks.

13. Explain various solution methods for OR models.



- 14. Explain (i) Slack variables (ii) Surplus variables and (iii) unrestricted variables.
- 15. Find the maximum value of

 $Z = 107 x_1 + \, x_2 + 2 \, x_3$

subject to

- 16. How do you define degeneracy in L.P.P? What is the procedure for resolving it?
- 17. What is meant by alternative optima? How do you recognize the existence of alternative optima from the final simplex table?
- 18. What is transportation problem? How the transportation tables are derived?
- 19. Write short notes on(i) feasible solution (ii) basic feasible solution (iii) non-degenerate basic feasible and (iv) optimal solution in a transportation problem.
- 20. Explain various types of errors that are possible while drawing network diagrams.
- 21. What are the steps in CPM? Explain.

(6×5=30)

Part C

Answer any two questions.

Each question carries **15** marks.

- 22. Briefly explain the origin and development of operations research. Describe the characteristics of operations research.
- 23. Solve the following L.P.P by Big M method:

Minimize $Z = 20 x_1 + 24 x_2 + 18 x_3$ Subject to $2 x_1 + x_2 + x_3 \ge 30$

24. Given the following cost matrix(in thousand rupees):

Bidder	Different weapon subsystems				
	1	2	3	4	
A	17	20	13	21	
В	15	21	14	18	
С	17	18	17	21	
D	14	22	12	22	





Assign different weapon subsystems contracts to different bidders so as to maintain cost. Each bidder should get only one contract.

Activity	Optimistic	Mostlikely	Pessimistic
ACTIVITY	time	time	time
1-2	1	2	3
2-3	1	2	3
2-4	1	3	5
3-5	3	4	5
4-5	2	3	4
4-6	3	5	7
5-7	4	5	6
6-7	6	7	8
7-8	2	4	6
7-9	4	6	8
8-10	1	2	3
9-10	3	5	7
3-10	5	5	1

25. A project schedule has the following characteristics:

(a) Draw the network diagram for the project

(b) Determine the critical path

(c) What is the probability of completing the project in 30 weeks?

(2×15=30)