647510 **BBAopeEC537D** **Seat No :_____**

B.B.A. Semester - 5 (*CBCS*) Examination

July-2025 (Old Course)

STATISTICS GROUP: FUNDAMENTALS OF OPERATION RESEARCH (ELECTIVE)

Time: 2:30 Hours **Marks: 70**

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Que.1 **A.** Explain Scope of operations research. (07)

Que.1 **B.** Explain advantages and drawbacks of O.R. model. (07)

OR

Que.1 **A.** What are essential features of the O.R. Model (07)

Que.1 **B.** Briefly mention the various phases of O.R. (07)

Que.2 **A.** Write characteristics of linear programming problem. (07)

Que.2 **B.** What is linear programming problem? (07)

OR

Que.2 Solve by graphic method. (14)

Min Z = 2000x + 1600y

Subject to Constraints

$6x + 2y \geq 12$,

$2x + 2y \geq 8$,

$4x + 12y \geq 24$,

$x \leq 7$, $y \leq 7$,

$x, y \geq 0$

Que.3 **A.** Define (07)

1) Slack Variables.
2) Surplus Variable.
3) Artificial Variable.

B. Give difference between Simplex Method and Graphic Method. (07)

OR

Que.3 Two machines A and B used in manufacturing footballs and volleyballs.The machine A is used for 2 minutes and the machine B is used for 3 minutes to manufacture a football, while the machine A is used for 4 minutes and machine B is to be used for 2 minutes to manufacture a volley ball. Each machine can be used for at most 2 hours a day. Each football gives a profit of Rs. 4 and each volleyball gives a profit of Rs. 5. How many foot balls and volleyballs should be manufactured so that profit is maximum? (14)

Que.4 **A.** Find initial solution by North West Corner Rule Method. (07)

Factory	Warehouse				Supply
	W_1	W_2	W_3	W_4	
F_1	21	16	25	13	11
F_2	17	18	14	23	13
F_3	32	27	18	41	19
Demand	6	10	12	15	

B. Explain unbalanceness of transportation problem how you overcome it. (07)

OR

Que.4 Find the optimal solution of the following transportation problem. (14)

	D_1	D_2	D_3	D_4	D_5	Supply
O_1	20	10	15	20	19	40
O_2	5	8	12	5	7	30
O_3	6	15	10	7	10	50
O_4	8	12	11	8	14	70
Demand	40	60	20	40	60	

Que.5 **A.** A compute Centre has got four expert programmers. The centre needs four application programmers to be developed. The head of the computer centre after studying carefully the programmers to be developed, estimates the computer time (in minutes) required by the respective experts to develop the application programmers as follows. (07)

	programmes				
		A	B	C	D
programmers	1	120	100	80	90
	2	80	90	110	70
	3	110	140	120	100
	4	90	90	80	90

B. How will you handle the following situations in an assignment problem. (07)

(1) maximization

(2) unbalanced problem.

OR

Que.5 A captain of a cricket team has to allot five middle positions to five batsmen. (14)

The average runs scored by each batsman at these positions are as follows:

	Batting positions					
		III	IV	V	VI	VII
Batsmen	A	40	40	35	25	50
	B	42	30	16	25	27
	C	50	48	40	60	50
	D	20	19	20	18	25
	E	58	60	59	55	53

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