Seat No. _____

HAR-19BBA509

B. B. A. (Sem. V) (CBCS) (W.E.F.-2019) Examination

June – 2023

Fundamentals of Operations Research

(New Course)

Time : $2\frac{1}{2}$ Hours / Total Marks : **70**

Instructions :

(1) Attempt all questions.

(2) Figures to the right indicates marks.

1 (a) Discuss the applications of operation research. **10**

(b) What is O.R. ? State its characteristics. **10**

OR

1 Explain the methodology of O.R. **20**

2 (a) What is meant by linear programming problem ? State its assumptions. **10**

(b) Explain the graphical method of solving a L.P.P. **10**

OR

2 Solve the following LPP using graphical method : **20**

Maximize $Z = 20x_1 + 12x_2$

Subject to $40x_1 + 80x_2 \leq 800$

$10x_1 + 4x_2 \leq 80$

$x_1 \leq 6$

$x_2 \leq 9$

$x_1 \geq 0, x_2 \geq 0$

3 (a) Discuss in brief duality in linear programming. **7**

(b) Define the following terms : **8**

(1) Slack variable

(2) Surplus variable

(3) Artificial variable

(4) Unbounded solution

OR

3 Solve the following LPP using simple method **15**

Maximize $Z = 4x + 3y$

Subject to $2x + 3y \leq 1000$

$x + y \leq 400$

$x \leq 200$

$x, y \geq 0$

4 Explain : **15**

(1) Transportation problem

(2) N/W corner rule method

(3) Matrix minima method

OR

4 Solve the following transportation problem : **15**

		Warehouse					
		A	*B*	*C*	*D*	*E*	*Supply*
Factory	*x*	55	30	40	50	50	40
	y	35	30	100	45	60	20
	z	40	60	95	35	30	40
Demand		25	10	20	30	15	100