

B.B.A. Semester - 5 (CBCS) Examination**December -2020 (NEW COURSE)****Statistics Group - Fundamentals of Operations Research (Elective)****Time: 1:30 Hours****Marks: 42****Instructions:**

1. Figures to the right indicate marks.
2. There are five questions in the question paper.
3. Answer any three of the following questions.

Q.1 Solve the following problem by simplex method (14)

$$\text{Maximum } Z = 3x_1 + 2x_2$$

Subject to the constraints

$$-x_1 + 2x_2 \leq 4$$

$$3x_1 + 2x_2 \leq 14$$

$$x_1 - x_2 \leq 3$$

$$x_1, x_2 \geq 0$$

Q.2 Let us assume that you have inherited Rs. 1,00,000 from your father-in-law that can be invested in a combination of only two stock portfolios, with the maximum investment allowed in either portfolio set at Rs. 75,000. The first portfolio has an average rate of return of 10%, whereas the second has 20%. In terms of risk factors associated with these portfolios, the first has a risk rating of 4 and the second has 9. Since you wish to maximize your return, you will not accept an average rate of return below 12% or a risk factor above 6. Hence you then face the impotent question. How much should you invest in each portfolio? Formulate and solve by graphic method. (14)

Q.3 Solve the following T.P. (14)

	W1	W2	W3	W4	W5	Supply
P1	5	8	6	6	3	80
P2	4	7	7	6	6	50
P3	8	4	6	6	3	90
Demand	40	40	50	40	80	

Q.4 A captain of a cricket team has to allot five middle batting positions to five batsmen. The average runs scored by each batsman at these position are as follows. (14)

	Batting Positions				
Batsman	III	IV	V	VI	VII
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

Make the assignment so that the expected total average runs scored by these batsmen are maximum.

Q.5 Write any two. (14)

1. Give any three definitions of operations' research?
2. Explain unbalance in T.P. how you solve it?
3. What do you understand by a LPP? What are its major limitations?
4. Explain Hungarian Method.
