JAE-161100010510 Seat No. _____

B.B.A. (Sem. V) (CBCS) (W.E.F. 2016) Examination
October - 2019
Statistics GRP : Fundamentals of Operations Research
[New Course]

Time : **2.30** Hours] [Total Marks : **70**

Instructions : (i) Attempt all five questions.
(ii) Each question carries equal marks.
(iii) Figure to the right indicates marks.

1 (a) What is O.R. ? State its characteristics. **7**

(b) Discuss the applications of O.R. **7**

OR

1 Explain the models of O.R. **14**

2 What is an assignment problem ? Describe Hungarian assignment method for solving an A.P. **14**

OR

2 Using the following cost matrix determine optimal job assignment and the cost of assignment. **14**

Job

	1	2	3	4	5
A	10	3	3	2	8
B	9	7	8	2	7
C	7	5	6	2	4
D	3	5	8	2	4
E	9	10	9	6	10

Worker

3 (a) Explain the difference between a T.P. and an A.P. 7

    (b) Explain : 7

       (1) N.W. corner rule

       (2) Least cost method

OR

3 Find out the otpimum solution for transporting the products at a minimum cost for the following transportation problem with cost structure as follows : 14

Warehouses

		W_1	W_2	W_3	W_4	Supply
	P_1	19	30	50	10	7
Plants	P_2	70	30	40	60	9
	P_3	40	8	70	20	18
Demand		5	8	7	14	

4 (a) What is L.P.P. ? State the uses of a L.P. 7

    (b) Explain the graphical method of solving a L.P.P. 7

OR

4 Solve the following LPP using graphical method. 14

Maximize $z = 80x + 120y$

Subject to $x + y \le 9$

           $2x + 5y \le 36$

           $x \ge 2$

           $y \ge 3$

           $x, y \ge 0$.

5 (a) Describe simplex method (maximisation case) for solving a LPP. 7

    (b) Discuss in brief 'duality' in linear programming. 7

OR

5 Solve the following LPP using simplex method. 14

Maximize $z = 40x_1 + 35x_2$

Subject to $2x_1 + 3x_2 \le 60$

           $4x_1 + 3x_2 \le 96$

           $x_1, x_2 \ge 0$.

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