

B.B.A. Semester - 5 (CBCS) Examination**Oct/Nov - 2025 (NEW COURSE)****Statistics Group - Fundamentals of Operations 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 role of O.R. in Business. (07)
 (B) Explain characteristics of O.R. (07)

OR

- Que.1 What is Operations research? Explain with merits and limitations. (14)
 Que.2 What is Transportation problem? (14)

OR

- Que.2 A company has received a contract to supply gravel for three new construction projects located in towns A, B, C. Construction engineers have estimated the required amounts of gravel which will be needed at these construction projects.

Project Location	weekly requirement (truck loaded)
A	144
B	204
C	82

The company has three gravel pits located in towns, W, X and Y respectively. The gravel required by the construction projects can be supplied by these three plants. The amount of gravel which can be supplied by each plant is as follows:

Plant	w	X	Y
Amount Available (truck loads)	152	164	154

The company has computed the deliver cost from each plant to the project site. These costs (in Rupees) are shown in the following table:

Cost per truck load (;000:Rs.)

Plant		A	B	C
	W	8	16	16
	X	32	48	32
	Y	16	32	48

Schedule the shipment from each plant to each project in such a manner so as to minimize the total transportation cost within the constraints imposed by plant capacitated and project requirements. Find the minimum cost.

- Que.3 What is Assignment Problem? Explain Hungarian method. (14)
 OR

Que.3 A methods engineer wants to assign five new methods to four work centres. The assignment of new methods will increase productions and they are given below. If only one method can be assigned to a work centre, determine the optimal assignment:

Methods	Increase in production (unit) Work Centres			
	I	II	III	IV
A	38	29	33	22
B	26	27	28	28
C	34	25	32	29
D	33	21	26	28
E	31	26	31	26

Que.4 Explain purpose and procedures of Simplex method. (14)

OR

Que.4 An animal feed company must produce 200 Kg. of mixture consisting of ingredients X_1 And X_2 . The ingredients X_1 cost Rs.3 per Kg. and X_2 cost Rs. 5 per Kg. not more than 80 Kg. of X_1 can be used and at least 60 Kg. of X_2 must be used. Find minimum cost mixture. Formulate and solve by Simplex Method.

Que.5 What is linear programming problem? (14)

OR

Que.5 Solve the following linear programming problem graphically

$$\text{Maximum } Z = 4X_1 + 6X_2$$

Subject to constraints

$$X_1 + X_2 = 5$$

$$X_1 \geq 2$$

$$X_2 \leq 4$$

$$X_1, X_2 \geq 0$$
