COMSATS University Islamabad

Abbottabad Campus

Department of Mathematics

Terminal Examination - Fall 2025

Class: BSE-7B | Date: December 23, 2025

Subject: Operations Research | Instructor: Dr. Sheikh Irfan Ullah Khan

Total Time Allowed: 180 Minutes | Max. Marks: 50

Name: _____ | Registration # _____

Q No 1: A company is producing a single product and selling it through five agencies situated in different cities. Suddenly, there is a demand for the product in five more cities that do not have any agency of the company. The company is faced with the problem of deciding on how to assign the existing agencies to dispatch the product to the additional cities in such a way that the travelling distance is minimised. The distances (in km) between the surplus and deficit cities are given in the following distance matrix.

	I	II	III	IV	V
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

Determine the optimum assignment schedule.

Q No 2: Find the Initial basic feasible solution using Vogel's Approximation Method.

	D_1	D_2	D_3	D_4	Supply
S_1	3	1	7	4	300
S_2	2	6	5	9	400
S_3	8	3	3	2	500
Demand	250	350	400	200	

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Q No 3: Find the optimum solution using modified distribution method.

	D_1	D_2	D_3	D_4	Supply
S_1	3	1	7	4	250
S_2	2	6	5	9	350
S_3	8	3	3	2	400
Demand	200	300	350	150	

Q No 4: Using the data given appended below.

	D1	D2	D3	D4	D5	Supply
O1	5	1	8	7	5	15
O2	3	9	6	7	8	25
O3	4	2	7	6	5	42
O4	7	11	10	4	9	35
Demand	30	20	15	10	20	

a) Check whether the given transportation problem is Balanced or Unbalanced?

b) Find IBFS.

Q No 5: Solve the LPP using Two-Phase Method

$$Z_{max} = 4x_1 + 5x_2$$

Subject to

$$2x_1 + 3x_2 \leq 6$$
$$3x_1 + x_2 \geq 3$$
$$x_1, x_2 \geq 0$$

Good Luck

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