ASSIGNMENT-2

Q1. Four companies viz. W, X, Y and Z supply the requirements of three warehouses viz. A, B and C respectively. The companies’ availability, warehouses requirements and the unit cost of transportation are given in the following table. Find an initial basic feasible solution using

1. North West Corner Method
2. Least Cost Method
3. Vogel Approximation Method (VAM)

# Warehouses

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company** | A | B | C | **Supply** |
| W | 10 | 8 | 9 | 15 |
| X | 5 | 2 | 3 | 20 |
| Y | 6 | 7 | 4 | 30 |
| Z | 7 | 6 | 9 | 35 |

**Requirement** 25 26 49 100

Q2. Find the optimum Solution of the following Problem using MODI method.

# Destination

|  |  |  |
| --- | --- | --- |
| 8 | 9 | 10 |
| 9 | 11 | 11 |
| 10 | 12 | 9 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source** | 1 | 2 | 3 | **Capacity** |
| A 42 |  |  |  |  |
| B |  |  |  | 30 |
| C |  |  |  | 28 |

**Demand** 35 40 25 100

Q3. Maximize

1170x1 + 1110x2

Subject to:

9x1 + 5x2 ≥ 500

7x1 + 9x2 ≥ 300

5x1 + 3x2 ≤ 1500

7x1 + 9x2 ≤ 1900

2x1 + 4x2 ≤ 1000

x1, x2 ≥ 0

Find graphically the feasible region and the optimal solution.

Q4. Solve the following LP problem graphical

Maximize

2x1 + 3x2

Subject to:

x1 – x2 ≤ 1 x1 + x2 ≥ 3 x1, x2 ≥ 0

Q5. Solve the following linear programming problem using two phase and M method.

Maximize

12x1 + 15x2 + 9x3

Subject to:

8x1 + 16x2 + 12x3 ≤ 250

4x1 + 8x2 + 10x3 ≥ 80

7x1 + 9x2 + 8x3 =105

x1, x2, x3 ≥ 0

Q6. Solve the following problem graphically Maximize

4x1 + 4x2

Subject to:

-2x1 + x2 ≤ 1

x1 ≤ 2

x1 + x2 ≤ 3

x1, x2 ≥ 0

Q7. Consider the following dual problem Minimize

3w1 + 4w2

Subject to:

3w1 + 4w2 ≥ 24

2w1 + w2 ≥ 10

5w1 + 3w2 ≥ 29

w1, w2 ≥ 0