1. Explain relationship between rank of the matrix and solution of the linear equations
2. Explain eigen values and eigen vectors.

1. Solve the given optimization problem

Z = 5X1 + 7X2 where

3X1+4X2 <=12 and 4X1 + 2X2 <= 20.

1. Using graphical methods
2. Using Linear Algebraic Methods
3. Using Simplex Method
4. Minimize Z=5x+3y Such that 3x +5y>=30 and 4x+2y >=25
   1. Using graphical methods
   2. Using Simplex Method
5. Explain Linear Programming.
6. Explain Integer Linear Programming
7. Use the algebraic method to solve the following LP problem.
   1. Minimize Z= 4X2 – X1 subject to the constraint. 6X2 – X1 ≤ 10 (ii) X1 + X2 ≤ 6 (iii) X1 – X2 ≤ 2, X1, X2 ≥ 0.
   2. Maximize Z = 5x+3y where 3x+2y <=12, 4x+3y<=12 and 2x + y <= 10
8. Solve above problem using graphical methods
9. What are advantages of Simplex over graphical method?
10. Determine the initial basic feasible solution for the given transportation problem , where Oi and Dj represents the ith origin and jth destination, respectively. Also, obtain the final optimal solution to the given problem.

Destination

Source D1 D2 D3 D4 Supply

O1 11 13 17 14 250

O2 16 18 14 10 300

O3 21 24 13 10 400

Demand 200 225 275 250

1. Using north-west corner methods
2. Using least cost methods
3. Using Vogel’s Approximation Methods

1. Explain transportation problem
2. Explain trashipment problem
3. Explain assignment problem
4. Determine the initial basic feasible solution for the given transportation problem for North-West Corner method, where Oi and Dj represents the ith origin and jth destination, respectively.

Destination

Source D1 D2 D3 D4 Supply

O1 6 4 1 5 20

O2 8 9 2 7 15

O3 4 3 6 2 15

Demand 12 15 15 8

1. Use Vogel’s Approximation Method to solve Transportation Problems for above example.
2. Use Least Cost Method
3. Explain Critical Path Method (CPM).

13. Explain PERT in complete detail.

14. Explain different properties of network diagram

Read chapter 9 notes from canvas