7) Initial Basic Solution in Transportation problem using Column Minimum method in Linear Programming and also check optimality with stepping stones method.

**PRE SESSION-7**

**Problem :**

Consider the **transportation problem** presented in the following table.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Distribution centre** | | | | | | |
|  |  | **D1** | **D2** | **D3** | **D4** | **Supply** |
| **Plant** | **P1** | 19 | 30 | 50 | 12 | 7 |
| **P2** | 70 | 30 | 40 | 60 | 10 |
| **P3** | 40 | 10 | 60 | 20 | 18 |
| **Requirement** |  | 5 | 8 | 7 | 15 |  |

Determine the optimal solution of the above problem.

**IN SESSION-7**

**Problem :**

KL University branches located at Vijayawada, Hyderabad, and Chennai. KL University provides course material in printed form at these locations with capacities 15, 30 and 20 units at Vijayawada, Hyderabad, and Chennai respectively. The university distributes the course material to students located at three locations Bangalore, Hyderabad and Coimbatore. The demand of the students is 5, 20 and 40 units for Bangalore, Hyderabad and Coimbatore respectively.

The cost of transportation per unit varies between different supply points and destination points. The transportation costs are given in the table.

The management of KL University would like to determine minimum transportation cost.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **U/S** |  | | | | **Supply** |
| **BGR** | **HYD** | **CON** |  |
| **BZA** | 15 | 60 | 35 |  | 15 |
| **HYD** | 45 | 30 | 60 |  | 30 |
| **CHE** | 30 | 90 | 20 |  | 20 |
| **Demand** | 5 | 20 | 40 |  |  |

**POST SESSION-7**

**Problem :**

Boutique brewery has two warehouses from which it distributes beer to five carefully chosen bars. At the start of every week, each bar sends an order to the brewery’s head office for so many crates of beer, which is then dispatched from the appropriate warehouse to the bar. The brewery would like to have an interactive computer program which they can run week by week to tell them which warehouse should supply which bar so as to minimize the costs of the whole operation. For example, suppose that at the start of a given week the brewery has 1000 cases at warehouse A, and 4000 cases at warehouse B, and that the bars require 500, 900, 1800, 200, and 700 cases respectively. Which warehouse should supply which bar?

We shall assume then that there is a fixed transportation cost

| **From Warehouse to Bar** | **A** | **B** |
| --- | --- | --- |
| 1 | 2 | 3 |
| 2 | 4 | 1 |
| 3 | 5 | 3 |
| 4 | 2 | 2 |
| 5 | 1 | 3 |