**BBDNITM**

**MECHANICAL DEPARTMENT**

**SESSION(2018-19)**

**OPERATIONS RESEARCH (NME 051)**

**Assignment no. 2**

**Question 01.** Mathematically formulate the assignment and transportation problem.

**Question 02.** Istransportation problem is a special case of linear programming problem?

**Question 03.** Use N-W and VAM method to find the basis feasible solution to the transportation problem given in table.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Supply |
| S1 | 19 | 30 | 50 | 10 | 7 |
| S2 | 70 | 30 | 40 | 60 | 9 |
| S3 | 40 | 8 | 70 | 20 | 18 |
| Demand | 5 | 8 | 7 | 14 |  |

**Question 04.** Solve the following transportation problem using least cost method.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | Supply |
| S1 | 6 | 3 | 6 | 200 |
| S2 | 2 | 5 | 7 | 100 |
| S3 | 5 | 4 | 9 | 300 |
| Demand | 175 | 150 | 275 | 600 |

**Question 05.** Use MODI method to find the optimal cost for the transportation problem given in Table.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | Supply |
| S1 | 8 | 1 | 6 | 100 |
| S2 | 2 | 3 | 7 | 200 |
| S3 | 5 | 4 | 9 | 300 |
| Demand | 175 | 150 | 275 | 600 |

**Question 06.** A department of a company has five employees with five jobs to be performed. The time required is given in the table below, how should the jobs be allocated one per employee so as to minimize the total man-hours?

Employees

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | I | II | III | IV | V |
| A | 8 | 6 | 15 | 14 | 16 |
| B | 3 | 6 | 18 | 13 | 6 |
| C | 10 | 7 | 2 | 2 | 2 |
| D | 7 | 11 | 9 | 7 | 13 |
| E | 7 | 9 | 10 | 4 | 12 |

**Question 07.** Write brief notes on:

* 1. Degenerate transportation problem
  2. Hungarians method for assignment problems.

**Question 08.** Apply MODI method to obtain optimal solution of transportation problem using the data given below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | Supply |
| S1 | 19 | 30 | 50 | 10 | 7 |
| S2 | 70 | 30 | 40 | 60 | 9 |
| S3 | 40 | 8 | 70 | 20 | 18 |
| Demand | 5 | 8 | 7 | 14 | 34 |