**DOMS304 Applications of Operations Research**

**Assignment Set – 1**

1. A factory manufactures two products A and B. To manufacture one unit of A, 10 machine hours and 15 labour hours are required. To manufacture product B, 20 machine hours and 15 labour hours are required. In a month, 400 machine hours and 300 labour hours are available. Profit per unit for A is Rs. 75 and for B is Rs. 50. Formulate as LPP.

2. Find solution using Simplex method

MAX Z = 3x1 + 5x2 + 4x3

subject to

2x1 + 3x2 <= 8

2x2 + 5x3 <= 10

3x1 + 2x2 + 4x3 <= 15

and x1, x2, x3 >= 0

3. Solve the following LPP graphically

Max Z = 4x + 5y

Subject to

x + y ≤ 20

3x + 4y ≤ 72

x, y ≥ 0

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**Assignment Set – 2**

4. Obtain an optimum solution to the following transportation problem

|  |  |  |
| --- | --- | --- |
| **Factory** | **Warehouse** | **Capacity** |
|  | **W1** | **W2** | **W3** | **W4** |  |
| **F1** | 19 | 30 | 50 | 10 | 7 |
| **F2** | 70 | 30 | 40 | 60 | 9 |
| **F3** | 40 | 8 | 70 | 20 | 18 |
| **Requirements** | 5 | 8 | 7 | 14 |  |

5. Consider the problem of assigning five jobs to five persons. The assignment costs are given as follows. Determine the optimum assignment schedule.

|  |  |
| --- | --- |
| **Person** | **Job** |
| **1** | **2** | **3** | **4** | **5** |
| **A** | 8 | 4 | 2 | 6 | 1 |
| **B** | 0 | 9 | 5 | 5 | 4 |
| **C** | 3 | 8 | 9 | 2 | 6 |
| **D** | 4 | 3 | 1 | 0 | 3 |
| **E** | 9 | 5 | 8 | 9 | 5 |

6. Discuss the applications of Integer programming.

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