

Institute of Information Technology & Management
Unit - III
Assignment – IV
LPP, Transportation & Assignment Problems

Programme: BCA
Subject: Applied Mathematics

Semester: II
Paper Code: 104

1. Given below is a Transportation table taken from the solution process:

<i>Distribution Cells</i>					
<i>Factories</i>		1	2	3	4
	A	10	8 5000	7	12
	B	12	13	6 4500	10 1500
	C	8 7000	10 500	12	14 1500

Solve the following questions:-

- Is this solution Feasible?
 - Is this solution Optimal? If not, then find the Solution?
 - Is this solution Degenerate?
 - Does the problem have an Alternative Optimal Solution? If yes, then find the solution?
2. A company has **4 Machines** to be assign to 4 of the 5 workers available for the purposes?
The expected **Production** from the each machine operated by worker as given below:

Expected Daily Products				Workers	
<i>Machine</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
<i>I</i>	40	46	48	36	48
<i>II</i>	48	32	36	29	44
<i>III</i>	49	36	41	38	45
<i>IV</i>	30	46	49	44	47

Find the Optimal Assignment cost for the workers?

3. Elaborate the following terms
- LPP*
 - Stepping-Stone Method*
 - Transportation Problem*
4. The **Manager of Oil Refineries** must decide on Optimal mix of two Blending Processes for which **I/O** per productions are as follows:

Process	Input	Output
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	Crude A	Crude B		Gasoline X	Gasoline Y
Amount					
1	5	3	5	8	300 Rs
2	4	5	4	4	400 Rs
Minimum Amount	200	150	100	80	

Find the solution of **LPP** by Graphical Method

5. Solve by Big M method and find optimal solution:

$$\text{Max } 4x_1 + x_2 + 3x_3 + 5x_4$$

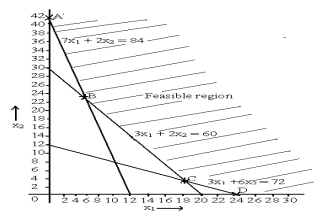
$$\text{St } 4x_1 + 6x_2 + 5x_3 + 4x_4 \geq -20$$

$$-3x_1 + 2x_2 + 4x_3 + x_4 \leq 10$$

$$-8x_1 + 3x_2 + 3x_3 + 2x_4 \leq 20$$

$$x_1, x_2, x_3, x_4 \geq 0$$

6. In Transportation Problem with 4 Supply and 5 Demands, how many Constraints are required?
- a) 20 b) 1 c) 0 d) 9
7. In a Transportation Problem, an Industry has 4 sources of supply and 5 for requirement of products. The total number of requirement is greater than number of demand. The number of iterations excluding Degeneracy is:
- a) 9 b) 6 c) 3 d) 0
8. How Unbalanced Transportation Problem convert into Balanced Transportation Problem?
- a) Add 1 in all cost cells b) Add only column with entries zero
- c) Add only row with entries zero d) Insert row or column with zero entries
9. For the given feasible solution, which of the following statements are correct?



- a) If we have maximization problem then solution is unbounded
- b) If we have minimization problem then solution is dfesible
- c) Both a) & b)
- d) None of these
10. Use the Big M method to solve the following problem:-
- $$\text{Max } Z = 8x_1 + 9x_2$$
- Subject to $x_1 - 3x_2 \leq 2$, $x_1 + x_2 \geq 6$,
- $$x_1, x_2 \geq 0$$

