

Machines

| Jobs | A | B | C | D | E |
|------|----|----|----|----|----|
| 1 | 11 | 17 | 8 | 16 | 20 |
| 2 | 9 | 7 | 12 | 6 | 15 |
| 3 | 13 | 16 | 15 | 12 | 16 |
| 4 | 21 | 24 | 17 | 28 | 26 |
| 5 | 14 | 10 | 12 | 11 | 15 |

O.R

(a) What is mean by Assignment Problem? Write mathematical form of Assignment Problem (9)

(b) Find the sequence that minimizes the total elapsed time required to complete the following jobs on two machines. Time is given in hours. (9)

| Job | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------|---|----|---|---|---|---|
| Machine A | 4 | 8 | 3 | 7 | 8 | 6 |
| Machine B | 6 | 33 | 7 | 3 | 9 | 5 |

Also find elapsed time for both the machines.

Que.4

Obtain optimal solution for the following Transportation Problem by using MODI Method. (17)

| | A | B | C | D | E | F | Supply |
|--------|----|----|----|----|----|----|--------|
| 1 | 9 | 12 | 9 | 6 | 9 | 10 | 50 |
| 2 | 7 | 3 | 7 | 7 | 5 | 5 | 60 |
| 3 | 6 | 5 | 9 | 11 | 3 | 11 | 20 |
| 4 | 6 | 8 | 11 | 2 | 2 | 10 | 90 |
| Demand | 40 | 40 | 60 | 20 | 40 | 20 | |

O.R

(a) What is mean by Transportation Problem? Explain Degeneracy in Transportation Problem. (9)

(b) Solve the following T.P. Problem by Vogel's Approximation Method. (8)

| Origin | A | B | C | D | Supply |
|--------|---|---|---|---|--------|
| 1 | 3 | 2 | 8 | 6 | 15 |
| 2 | 4 | 5 | 2 | 1 | 5 |
| 3 | 3 | 7 | 9 | 9 | 3 |
| Demand | 5 | 7 | 8 | 5 | |

(2)