

**Second Semester M.B.A. (Distance Mode) Degree
Examinations June 2009
(New Scheme)**

MBA DP - 205 : MANAGEMENT SCIENCE

Time : 3 Hours

Max. Marks : 80

SECTION-A

Answer the following questions. Each question carries two marks. 2x5=10

1. Explain the following terms.
 - a) Pure strategy
 - b) EOQ
 - c) Pivot element
 - d) Analogue model
 - e) Saddle point

SECTION-B

Answer any FIVE of the following. Each question carries SEVEN marks. 5x7=35

2. Explain the Hungarian method of finding BFS of transportation problem with example.
3. Briefly explain the different type's inventory costs.
4. Explain the applications of management science in today's business world.
5. Solve the following game and find optimal strategies for the two players

| | | | | | |
|----------|---|----------|----|----|----|
| | | Player B | | | |
| | | A | B | C | D |
| Player A | 1 | 10 | 5 | -2 | 8 |
| | 2 | 13 | 12 | 15 | 12 |
| | 3 | 16 | 14 | 10 | 15 |

6. Find the critical path for the following data.

| Activities | 1-2 | 1-3 | 2-5 | 3-4 | 3-5 | 3-6 | 4-6 | 4-7 | 6-7 | 5-8 | 7-8 |
|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Duration (Weeks) | 3 | 5 | 8 | 3 | 2 | 4 | 5 | 3 | 8 | 6 | 5 |

7. A salesman has to visit cities A,B,C,D, and E. The distances (in hundred miles) between the five cities are as follows: If the salesman starts from city A and has to come back to city A, which route should he select so that the total distance traveled is minimum.

| | | | | | | |
|------|---|----|----|----|----|----|
| | | TO | | | | |
| | | A | B | C | D | E |
| FROM | A | - | 12 | 18 | 12 | 10 |
| | B | 12 | - | 16 | 11 | 10 |
| | C | 14 | 13 | - | 17 | 9 |
| | D | 11 | 10 | 17 | - | 11 |
| | E | 10 | 8 | 13 | 14 | - |

SECTION-C

Answer the following. Q.No. 8 and 9 carry 10 marks each and Q.No. 10 carries 15 marks. 2x10+15=35

8. a) Given the following sales matrix, find the optimal assignment plan.

Estimated Sales (Rs. In lakhs)

| | | | | | |
|----------|---|-----|-----|-----|-----|
| | | 1 | 2 | 3 | 4 |
| Salesman | A | 300 | 250 | 270 | 320 |
| | B | 260 | 220 | 250 | 240 |
| | C | 290 | 295 | 290 | 300 |
| | D | 280 | 275 | 260 | 290 |

OR

b) Solve the following LPP using graphical method.

$$\text{Max } Z = 9X_1 + 10X_2$$

Subject to the constraints

$$11X_1 + 9X_2 \text{ lesser than or equal to } 9900$$

$$7X_1 + 12X_2 \text{ lesser than or equal to } 8400$$

$$6X_1 + 16X_2 \text{ lesser than or equal to } 9600$$

Where X_1, X_2 Greater than equal to 0

9. a) A company has four factories manufacturing the same commodity, which are required to be transported to meet the demands in four warehouses. The supply and demands and the cost of transportation in rupees per unit are given in the following table.

Warehouses

| Factory | W | X | Y | Z | Supply |
|---------|----|-----|-----|-----|--------|
| A | 35 | 50 | 65 | 70 | 70 |
| B | 35 | 50 | 30 | 40 | 140 |
| C | 36 | 26 | 45 | 66 | 150 |
| D | 35 | 41 | 30 | 50 | 50 |
| Demand | 90 | 100 | 120 | 140 | |

OR

b) The machine A costs Rs. 45,000 and the operating costs are estimated at Rs.1000 for the first year, increasing by Rs. 10,000 per year in the second and subsequent years. Determine the optimum period for replacement of the machine.

10. The data below shows the relationship between various activities and their time durations. Construct a network and find total slack and free slack.

| Activity | 1-2 | 2-3 | 2-4 | 3-5 | 3-6 | 4-6 | 4-7 | 5-8 | 6-8 | 7-8 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Time (days) | 7 | 8 | 5 | 4 | 3 | 7 | 5 | 6 | 3 | 6 |