

July-August 2016

**Master of Business Administration (MBA) Examination**  
**II Semester**

**Optarion Research for Bussiness Decisions**

Time : 3 Hours ]

[ Max. Marks : 80

**Note :** Attempt any two question from Section A and any three questions from section B. All questions carry equal marks.

**Section A**

1. Explain how and why Operation Research Methods have been valuable in aiding executive decisions.
2. Discuss the Monte Carlo Method of solving a problem, illustrating it by outlining a procedure to solve a specified problem of your choice.
3. Discuss briefly:
  - (a) The general similarities between Dynamic programming and linear programming.
  - (b) How does Dynamic programming conceptually differ from linear programming?

**Section B**

4. Goods have to be transported from sources  $S_1$ ,  $S_2$  and  $S_3$  to destinations  $D_1$ ,  $D_2$  and  $D_3$ . the transportation cost / unit, capacities of the sources and the requirements of the destinations are given in the following table :

	$D_1$	$D_2$	$D_3$	Supply
$S_1$	8	5	6	120
$S_2$	15	10	12	80
$S_3$	3	9	10	80
Demand	150	80	50	

Determine a transportation schedule so that cost is minimized.

5. Arrivals at telephone booth are considered to be Poisson with asn average time of 10 minutes between one arrival and the next the length of phone calls is assumed to be distributed exponentially, wityh a mean of 3 minutes.
  - (a) What is the probability that a person arriving at the booth will have to wait?
  - (b) The telephone department will install a second booth when convinced that an arrival would expert waiting for at least 3 minites for a phone call. By how much should the flow of arrivals increase in order to justify a second booth?

- (c) What is the average length of the queue that from time to time?

Solve the following L.P.P. :

$$\text{Maximize } z = 2x_1 + 3x_2 + 4x_3$$

$$\text{subject to } 3x_1 + x_2 + 4x_3 \leq 600$$

$$2x_1 + 4x_2 + 2x_3 \geq 480$$

$$2x_1 + 3x_2 + 3x_3 = 540$$

$$x_1 + x_2 + x_3 \geq 0.$$

A small garment making unit has 5 tailors stitching five different types of germents. all the five tailors are capable of statching all the five types of garments. The output per day per tailor and the profit (Rs.) for each type of garments are given below:

	Garments				
Tailors	1	2	3	4	5
A	7	9	4	8	6
B	4	9	5	7	8
C	8	5	2	9	8
D	6	5	8	10	10
E	7	8	10	9	9
Profit (Rs.)	2	3	2	3	4

Per germents

- (a) which type of garment should be assigned to which tailor in order to maximize profit, assuming that there are no other constraints?
- (b) If tailor D is absent for a specified period and no other substitute tailor is available, what should be the optimal assignment?

- (a) Solve the following game:

		Player B					
		I	II	III	IV	V	VI
layer A	1	4	2	0	2	1	1
	2	4	3	1	3	2	2
	3	4	3	7	-5	1	2
	4	4	3	4	-1	2	2
	5	4	3	3	-2	2	2

- (b) A company has a machine whose cost is Rs. 30,000 Its maintenance cost and resale value at the end of different years are given below:

Year	1	2	3	4	5	6
Maintenance Cost (Rs.)	4500	4700	5000	5500	6500	7500
Resale Value (Rs.)	27000	25300	24000	21000	18000	13000

What is the economic life of the machine and what is the minimum average cost?