



MBA (PT) DEGREE III SEMESTER EXAMINATION NOVEMBER 2014

SMP 2305 MANAGEMENT SCIENCE

(Prior to 2012 Admission)

Time: 3 Hours

Maximum Marks: 50

(5 x 10 = 50)

- I. (a) Discuss the difference between decision making under uncertainty and risk.
 (b) A person has the choice of running a hot snack stall or an ice-cream and cool drink stall at Ooty. If the weather is cool and rainy, he can expect to make a profit of ₹15000 and if it is warm he can expect to make a profit of ₹3000 by running a hot snack stall. On the other hand, if his choice is to run an ice-cream and cool drink stall, he can expect to make a profit of ₹18000 if the weather is warm and ₹3000 if the weather is cool and rainy. There is 40% chance of weather being warm in the coming season. Should he opt for running the hot snack stall or an ice-cream stall?

OR

- II. (a) What is a game in a game theory? What are the properties of a game? Explain the "best strategy" on the basis of minimax criterion of optimality.
 (b) A and B play a game in which each has three coins, a 5 p, a 10 p and a 20 p. Each selects a coin without the knowledge of the other's choice. If the sum of the coins is odd amount, A wins B's coin, if the sum is even B wins A's coin. Find the best strategy for each player and the value of the game.
- III. (a) What is Linear Programming? State the conditions for using LPP for optimization problems.
 (b) A manufacturer of furniture makes two products, chairs and tables. Processing of these products is done on two machines A and B. A chair requires 2 hours on machine A and 6 hours on machine B. A table requires 5 hours on machine A and no time on machine B. There are 16 hours of time per day available on machine A and 30 hours on machine B. Profit gained by the manufacturer from a chair and a table is ₹2 and ₹10 respectively. What should be the daily production of each of the products?

OR

- IV. Use duality to solve the following LPP.

$$\text{Maximise } z = 2x_1 + x_2$$

Subject to constraints

$$x_1 + 2x_2 \leq 10$$

$$x_1 + x_2 \leq 6$$

$$x_1 - x_2 \leq 2$$

$$x_1 - 2x_2 \leq 1$$

$$x_1, x_2 \geq 0$$

- V. (a) What is an assignment problem? Give two areas of its application.
 (b) Solve the following assignment problem

	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

OR

(P.T.O.)

- VI. (a) Explain the difference between a transportation problem and an assignment problem.
 (b) Determine the basic feasible solution to the following transportation problem.

Sources	Distribution Centres				Supply
	D ₁	D ₂	D ₃	D ₄	
S ₁	2	3	11	7	6
S ₂	1	0	6	1	1
S ₃	5	8	15	9	10
Requirements	7	5	3	2	

- VII. (a) Write a short note on the sequencing decision problem for 'n' jobs on two machines.
 (b) We have five jobs, each of which must be processed on the two machines A and B in the order AB. Processing time in hours are given in the table below:

Job	1	2	3	4	5
Machine A	5	1	9	3	10
Machine B	2	6	7	8	4

Determine a sequence for the five jobs that will minimise the elapsed time T.

OR

- VIII. (a) Explain:
 (i) queue discipline (ii) capacity of the system (iii) holding time
 (iv) balking (v) jockeying
 (b) At a one-man barber shop, the customers arrive at the following Poisson process at an average rate of 5 per hour and they are served according to exponential distribution with an average service rate of 10 minutes. Assuming that only 5 seats are available for waiting customers, find the average time a customer spends in the system.
- IX. (a) Explain Monte Carlo simulation technique.
 (b) A tourist car operator finds that during the past few months the car's use has varied so much that the cost of maintaining the car has varied considerably. During the past 200 days the demand for the car fluctuated as below:

Trips per week	Frequency
0	16
1	24
2	30
3	60
4	40
5	30

Using random numbers simulate the demand for a 10 week period.

OR

- X. (a) Distinguish PERT and CPM.
 (b) Given the following information:

Activity	0-1	1-2	1-3	2-4	2-5	3-4	3-6	4-7	5-7	6-7
Duration (days)	2	8	10	6	3	3	7	5	2	8

- (i) Draw the arrow diagram
 (ii) Identify the critical path and find the total project duration
 (iii) Determine total, free and independent floats.


