

**MBA (FT)/MBA (IB)/MBA (PT) DEGREE III SEMESTER EXAMINATION
NOVEMBER 2015**

SMS 2301/SMI 2302/SMP 2302 MANAGEMENT SCIENCE
(Regular and Supplementary)

Maximum Marks: 50

Time: 3 Hours

PART A

(Answer *ALL* questions)

(5 × 2 = 10)

Explain minimax principle.

Write any two applications of L.P.P.

What do you mean by degeneracy in transportation?

Give the meaning of simulation.

Write the significance of critical path.

PART B

(Answer *ANY FIVE* questions)

(5 × 4 = 20)

6. Write the steps in decision-tree analysis.

7. Give a note on integer programming.

8. Babies are born in a sparsely populated state at the rate of one birth every 12 minutes. The time between births follows an exponential distribution. Find the following:

(i) The average number of births per year

(ii) The probability that no births will occur in any one day.

9. Discuss the steps in solving simulation problem.

10. Draw an arrow diagram and find the critical path for the following data:

Activity	A	B	C	D	E	F	G
Predecessors	-	-	A	A, B	C, D	B, D	E, F
Duration (In days)	2	1	3	2	1	3	1

11. A department has five employees with five jobs to be performed. The time (in hours) each man will take to perform each job is given in the effectiveness matrix.

		Employees				
		I	II	III	IV	V
Jobs	A	10	5	13	15	16
	B	3	9	18	13	6
	C	10	7	2	2	2
	D	7	11	9	7	12
	E	7	9	10	4	12

How should the jobs be allocated one per employee, so as to minimize the total man-hours?

(P.T.O.)

Solve the LPP graphical method.

$$\text{Maximize } z = 7x_1 + 3x_2$$

Subject to the constraints

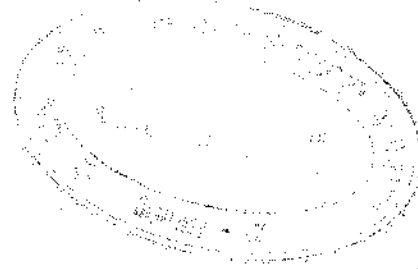
$$x_1 + 2x_2 \geq 3$$

$$x_1 + x_2 \leq 4$$

$$x_1 \leq \frac{5}{2}$$

$$x_2 \leq \frac{3}{2}$$

$$\text{and } x_1, x_2 \geq 0$$



PART C

(Answer ANY TWO questions)

(2 × 10 = 20)

3. Use simplex method to solve the following L.P.P.

$$\text{Maximize } z = 3x_1 + 5x_2 + 4x_3$$

Subject to

$$2x_1 + 3x_2 \leq 8$$

$$2x_2 + 5x_3 \leq 10$$

$$3x_1 + 2x_2 + 4x_3 \leq 15$$

$$\text{and } x_1, x_2, x_3 \geq 0$$

4. For the transportation cost matrix find the optimal solution.

	D1	D2	D3	D4	Supply
S ₁	19	30	50	10	7
S ₂	70	30	40	60	9
S ₃	40	8	70	20	18
Demand	5	8	7	14	

5. A small project is composed of 7 activities whose time estimates are listed in the table below. Activities are identified by their beginning (i) and ending (j) node numbers.

Activity	Estimated Duration (weeks)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Find the expected duration and variance of each activity. What is the expected project length? What is the probability that the project will be completed at least 4 weeks earlier has expected?

Z	:	0.50	0.67	1.00	1.33	2.00
Prob	:	0.3085	0.2514	0.1587	0.0918	0.228