BA (C) III/11.15.0857 Reg. No.

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

SMS 2301/SMI 2302/SMP 2302 MANAGEMENT SCIENCE

(Regular and Supplementary)

ime: 3 Hours Maximum Marks: 50

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 bore in a sparsely populated state at the rate of one birth every 12 minutes. The time between births follows on 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.

Maximize $z = 7x_1 + 3x_2$

Subject to the constraints

$x_1 + 2x_2 \geq 3$

$x_1 + x_2 \leq 4$

$x_1 \leq 5/2$

$x_2 \leq 3/2$

and $x_1, x_2 \geq 0$

PART C

(Answer ***ANY TWO*** questions)

$(2 \times 10 = 20)$

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

Maximize $z = 3x_1 + 5x_2 + 4x_3$

Subject to

$2x_1 + 3x_2 \leq 8$

$2x_2 + 5x_3 \leq 10$

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

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

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