

MAY 2012

P/ID 6030/MEN

Time : Three hours

Maximum : 80 marks

PART A — ($8 \times 5 = 40$ marks)

Answer any EIGHT questions.

All questions carry equal marks.

1. State the application of linear programming in manpower planning.
2. Describe the advantages of integer programming.
3. State the simplex technique in transportation problem.
4. What is mean by travelling salesman problem?
5. Discuss Langrance multipliers.
6. Describe the Kuhn-Tucker conditions.
7. State the use of dynamic programme in decision making.
8. Discuss recursive equation.
9. What is mean by production scheduling?

10. Describe the transient probabilities.
11. State the uses of Markov process in decision making.
12. Describe the Kendall notation.

PART B — (4 × 10 = 40 marks)

Answer any FOUR questions.

All questions carry equal marks.

13. Solve the following LPP.
Maximize $Z = 15x_1 + 16x_2 + 9x_3 + 2x_4$
Subject to the constraints
 $2x_1 + x_2 + 5x_3 + 0.6x_4 \leq 10$
 $3x_1 + x_2 + 3x_3 + 0.25x_4 \leq 12$
 $7x_1 + x_4 \leq 35$
 $x_j \geq 0; j=1, 2, 3, 4.$
14. Use branch and bound method to solve the following LPP.
Maximize $Z = 3x_1 + 5x_2$
Subject to
 $2x_1 + 4x_2 \leq 25$
 $x_1 \leq 8$
 $2x_2 \leq 10$
 x_1, x_2 are non-negative integers

15. Approximate the following problem as mixed integer program.

$$\text{Maximize } Z = e^{-x_1} + x_1 + (x_2 + 1)^2$$

Subject to

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

$$x_1, x_2 \geq 0.$$

16. Solve the following problem by the linear combination method.

$$\text{Minimize } f(x) = x_1^3 + x_2^3 - 3x_1 x_2$$

Subject to

$$3x_1 + x_2 \leq 3$$

$$5x_1 - 3x_2 \leq 5$$

$$x_1, x_2 \geq 0.$$

17. Inventory is withdrawn from a stock of 80 items according to a Poisson distribution at the rate of 5 items per day. Determine the following. (a) the probability that 10 items are withdrawn during the first 2 days. (b) the probability that no items are left at the end of 4 days.

18. Describe the optimum basic feasible solution to the following transportation problem.

	Available			
	50	30	220	1
	90	45	170	3
	250	200	50	4
Required	4	2	2	