

SVKM's NMIMS
School of Distance Learning

Programme PGDSCM

Academic Year: 2011-2012

Subject: Decision Analysis and Modeling

Date: 4.1.2012

Semester

Course

Marks:

Time:

IV

New

70

3.00 p.m to 6.00 p.m

Note: All Questions are compulsory.

Q 1) Attempt any Two

[10]

- a) State the advantages and limitations of Linear Programming Problem.
- b) What is degeneracy in LP problems? When does it occur? How can degeneracy problem be solved?
- c) What are the Advantages and Disadvantages of Simulation?
- d) Write short note on Time Series Forecasting Methods?

Q 2) Attempt any Two

[10]

- a) Explain Feasible solution in Transportation problem. Explain MODI's method for optimal solution.
- b) Discuss between individual and group decision making?
- c) Define Integer Programming? Write short note on cutting plane method?
- d) Explain Linear analysis & non-linear analysis in time series analysis.
- e) Explain one-way Anova and two-way Anova

Q 3) Attempt any Three

[30]

- a). Explain Saddle Point? Solve the game given below and find the saddle point and value of game for player A

$$\begin{bmatrix} -4 & 0 & 4 \\ 1 & 4 & 2 \\ -1 & 5 & -3 \end{bmatrix} \text{ Player A}$$

- b) Determine the trend values of the following data by using 3-year moving average.

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Production ('000 tonnes)	36	37	39	38	37	39	40	42	41	43

- c) A cement factory manager is considering the best way to transport cement from his three manufacturing centres P, Q, R to depots A, B, C, D & E, the weekly production and demands alongwith transportation costs per ton are given below. What should be the distribution programme to minimize the transportation cost.

- a) Is the solution feasible?
- b) Is there any alternate Solution
- c) Is the solution optimal?
- d) What is the minimum transportation cost?

	A	B	C	D	E	Demand
P	14	11	13	14	14	160
Q	12	13	20	12	13	235
R	13	15	20	14	14	140
Supply	120	145	120	180	130	

d). What is minimum spanning tree. Write algorithm for Kruskal's algorithm.

e). Solve by Graphical Method

$$\text{Minimise } Z = 20x_1 + 25x_2$$

$$\text{Subject to } 12x_1 + 15x_2 \geq 300$$

$$2x_1 + x_2 \geq 200$$

$$4x_1 + 3x_2 \geq 240$$

$$x_1, x_2 \geq 0$$

Q 4) Attempt any Two

[20]

a). Find the dual of the given LP problem and hence solve the dual by simplex method

$$\text{Minimise } Z = 6x_1 + 15x_2$$

$$\text{Subject to } 3x_1 + 8x_2 \geq 80$$

$$6x_1 + 5x_2 \geq 100$$

$$5x_1 + 6x_2 \geq 95$$

$$6x_1 + 8x_2 \geq 110$$

$$x_1, x_2 \geq 0$$

b). An advertising agency wishes to reach two types of audiences. Customers with monthly income: greater than Rs. 15,000 (target audiences A) and customers with monthly income: of less than Rs. 15,000 (target audiences B). The total advertising budget is Rs. 2,00,000. One programme of TV advertising costs Rs. 50,000, one programme on radio costs Rs. 20,000. For contract reasons, at least 3 programmes ought to be on TV and the number of radio programmes must be limited to 5. Survey indicates that a single TV programme reaches 4,50,000 customers in target audiences A and 50,000 in target audience B. One radio programme reaches 20,000 in target audience A and 80,000 in target audience B. determine the media mix to maximize the total reach. Solve by Simplex method.

- c). A construction company has developed a pay off table for the three alternative decisions which it is considering taking into consideration three estimates for the demand for house construction, The pay off table is given below.

Decision Alternative	States of Nature		
	Low	Moderate	High
Hire own employees	Rs 350000	Rs 300000	Rs 625000
Sub-contract	Rs 100000	Rs 250000	Rs 415000
Do Nothing	Rs 500000	Rs 800000	Rs 300000

Which alternative is best according to each of the following decision criteria?

- i) Maximin
- ii) Maximax
- iii) Savage Regret minimax
- iv) Minimax
- v) Laplace

X

3/3