

(i) Printed Pages: 4

Roll No.

(ii) Questions : 9

Sub. Code :

3	6	2	1
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Exam. Code :

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M.Sc. Information Technology 3rd Semester
(1129)

**SYSTEM APPROACH TO MANAGEMENT AND
OPTIMIZATION TECHNIQUES**

Paper-MS-14

Time Allowed : Three Hours]

[Maximum Marks : 80

Note :—Attempt FIVE questions in all, including Q. No. 1 in Section-A, which is compulsory and taking ONE each from Section-B to Section-E. Marks are indicated on the right of various questions.

SECTION—A

(Compulsory Question)

1. (a) What are limitations of Operations Research (OR) ?
- (b) What is the role of computers in Operations Research (OR) ?
- (c) In what way revised simplex method is better than original simplex method to solve LPP ?
- (d) What is binary linear programming problem ?

(e) What is traveling salesman problem ?

(f) Define and explain the term MIS.

(g) Explain why 'Feedback' and 'Control' are considered as the 'key system components' ?

(h) What are four P's Marketing ?

(i) What is human resource intelligence ? $8 \times 2 = 16$

SECTION—B

2. (a) Define Operations Research (OR). Briefly explain the characteristics of various models or OR.

(b) Solve the following Linear Programming Problem (LPP) graphically to maximize $Z = x + 3y$, subject to $3x + y \leq 3$ and $x - y \geq 2$, where $x \geq 0, y \geq 0$.

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3. Consider the following problem :

$$\max 3x_1 + 2x_2$$

$$\text{s.t. } 3x_1 + x_2 \leq 12$$

$$x_1 + x_2 \leq 6$$

$$5x_1 + 3x_2 \leq 27$$

$$x_1, x_2 \geq 0.$$

Solve the dual of this problem by the *dual simplex method*.

16

SECTION—C

4. Consider the following transportation table for a minimization problem :

	1	2	3	4	Supply
1	3	4	3	3	60
2	6	5	9	4	70
3	3	2	1	2	90
Demand	100	60	40	20	

(a) A basic feasible solution for the given transportation is given as BV : $\{x_{11}, x_{13}, x_{21}, x_{24}, x_{32}, x_{33}\}$. Find the values of the basic variables. Prove that this solution is not optimal.

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(b) Find the optimal solution using transportation simplex method starting from the basic feasible solution given in part a.

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5. Solve the following integer programming problem using Branch and Bound technique :

$$\text{Maximize } Z = 10x_1 + 20x_2,$$

subject to the constraints :

$$6x_1 + 8x_2 \leq 48$$

$$x_1 + 3x_2 \leq 12$$

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

16

SECTION—D

6. "Decision Support System (DSS) users see DSS as a tool to facilitate organizational processes." Justify this statement.

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7. What is Marketing Information System ? Explain its importance. Also enumerate its important subsystems. What are the various decisions that can be made with the help of each of these subsystems ?

16

SECTION—E

8. What are the objectives of Financial Information System (FIS) ? What are the different levels of forecasting and their respective role in decision making in a FIS ?

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9. What is manufacturing information system ? What is the need of an information system in manufacturing ? Describe the quality and cost subsystems of manufacturing information system.

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