

(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 ? 8×2=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 $x \geq 0, y \geq 0$. 8,8

3. Consider the following problem :

$$\begin{aligned}
 &\max 3x_1 + 2x_2 \\
 &\text{s.t. } 3x_1 + x_2 \leq 12 \\
 &\quad x_1 + x_2 \leq 6 \\
 &\quad 5x_1 + 3x_2 \leq 27 \\
 &\quad x_1, x_2 \geq 0.
 \end{aligned}$$

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

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.
- (b) Find the optimal solution using transportation simplex method starting from the basic feasible solution given in part a. 8,8
5. Solve the following integer programming problem using Branch and Bound technique :

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

subject to the constraints :

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

$$x_1 + 3x_2 \leq 12$$

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

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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 ?

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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 ?
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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8,8