

2022  
M.Sc. Information Technology  
Third Semester

MS-14: Systems Approaches to Management and Optimization Techniques

Time allowed: 3 Hours

Max. Marks: 80

**NOTE:** Attempt five questions in all, including Question No. 1 (Section-A) which is compulsory and selecting one question each from Section B-E.  
x-x-x

**Section - A**

- 1) Attempt the following:-
- a) Explain characteristics of knowledge based system.
  - b) Explain any two financial forecasting techniques.
  - c) What is the role of computers in operations research?
  - d) What is binary linear programming problem? Explain with an example. (4x4)

**Section - B**

- 2) a) What is the role of operations research in managerial decision making? What are its various models?
- b) Solve the following linear programming problem by Big- M method.
- Maximize  $Z = X_1 + 2X_2 + 3X_3 - X_4$  and subject to constraints  $X_1 + 2X_2 + 3X_3 = 15$ ,  
 $2X_1 + X_2 + 5X_3 = 20$ ,  $X_1 + 2X_2 + X_3 + X_4 = 10$  and  $X_1, X_2, X_3, X_4 \geq 0$  (8,8)

- 3) What is the importance of Revised Simplex Method? Solve the following Linear Programming Problem by using Revised Simplex Method:

Max  $3x_1 + 2x_2$   
s.t.  $3x_1 + x_2 \leq 12$   
 $x_1 + x_2 \leq 6$   
 $5x_1 + 3x_2 \leq 27$   
 $x_1, x_2 \geq 0$  (16)

**Section - C**

- 4) a) Give the generalized mathematical formulation of Transportation problem.
- b) Find the optimal solution of the following transportation problem:

	W1	W2	W3	W4	Capacity
F1	95	105	80	15	12
F2	115	180	40	30	7
F3	195	180	95	70	5
Requirement	5	4	4	11	

(6,10)

- 5) Explain the following with examples:-
- a) Dynamic Programming
  - b) Travelling Salesman Problem and its solution (8,8)

P.T.O.

(2)

**Section-D**

- 6) What are the various components of a computer based information system? Explain different types of information systems required at different levels of management hierarchy. (16)
- 7) What is an accounting information system? What are examples of accounting information systems? Discuss the functions and parts of an Accounting Information System. (16)

**Section-E**

- 8) What is meant by human resource information system (HRIS)? Explain the need and objectives of HRIS. What are its various subsystems in the changing business environment of today? (16)
- 9) Discuss the framework of the manufacturing information system of a firm manufacturing various consumer durable products. (16)

X-X-X