M.Sc. Information Technology 3rd Semester
1128

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. **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) Explain the need for Management Information System (MIS).

   (b) What is meant by a "Decision Support System" ?

   (c) What is ABC analysis in inventory control ?

   (d) What do you mean by a 'product mix' ?

   (e) What are the characteristics of Operations Research (OR) ?

   (f) What is sensitivity analysis ?

   (g) What is binary linear programming ?

   (h) Differentiate between balanced and unbalanced transportation problem. $8\times2=16$

SECTION—B

2. (a) Explain briefly any two Operations Research (OR) models that can be used for decision making in an organization.

(b) For the following linear programming problem :

(i) Identify the variables you will use and say precisely what each one represents,

(ii) List all the constraints on the variables and say where each is from,

(iii) Identify the objective function.

Solve the problem graphically.

A Stick Company makes two kinds of sticks. Type A sticks require 2 labour-hours for cutting, 1 labour-hour for stringing, and 2 labour-hours for finishing and are sold for a profit of Rs. 8. Type B sticks require 1 labour-hour for cutting, 3 labour-hours for stringing, ánd 2 labour-hours for finishing and are sold for a profit of Rs. 10. Each day the company has available 120 labour-hours for cutting, 150 labour-hours for stringing, and 140 labour-hours for finishing. How many sticks of each kind should be manufactured each day to maximize profits ?   8,8

3. Apply the Simplex method to solve the following L.P.P. :

Minimize : $Z = 3x_1 + 2.25x_2$

subject to :

$$2x_1 + 4x_2 \geq 40$$
$$3x_1 + 2x_2 \geq 50$$
$$x_1, x_2 \geq 0$$

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SECTION—C

4. Explain the following :

   (a) Branch and bound technique for solving integer linear programming problem

   (b) Dynamic programming. 8,8

5. A Computer Centre (CC) has four expert programmers. The CC needs four application programs to be developed. The head of CC after carefully studying, estimates the time required (in hours) by the experts to develop the application programs. Find the assignment of programmers to programs so that total time is minimized :

		A	B	C	D
		Programs			
Expert	1	120	100	80	90
	2	80	90	110	70
	3	110	140	120	100
	4	90	90	80	90

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SECTION—D

6. (a) Define data and information. What is the difference between the two ? What are the main characteristics of the information ?

   (b) Explain briefly the meaning of marketing research. Explain its significance in modern times. Explain in detail the sources of information in marketing research.

   8,8

7. (a) What is meant by a "Knowledge-based system" ? Describe the basic components of a knowledge-based system.

   (b) Highlight the features and use of Tally Accounting Package.

   8,8

SECTION—E

8. (a) What is inventory management ? Explain the techniques of inventory management.

   (b) Describe the quality and cost subsystems of manufacturing information system.   8,8

9. How MIS is applied in Financial Management ? Discuss in detail its application, including funds management, forecasting, query, decision analysis etc.   16