(i) Printed Pages : 7] Roll No. .....

(ii) Questions : 9] Sub. Code : 3 6 2 1

Exam. Code : 0 4 6 1

M.Sc. 3rd Semester Examination

1127

INFORMATION TECHNOLOGY

(System Approach to Management and Optimization Techniques)

Paper : MS–14

Time : 3 Hours] **[Max. 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 is the role of computers in Operations Research ?

   (b) What is meant by 'Sensitivity Analysis' in the context of Linear Programming problem ?

(c) What is Binary Linear Programming ?

(d) What is Degeneracy in a LPP ?

(e) What are the functions of Accounting Information System ?

(f) Explain two features of 'Tally'.

(g) What is the goal of Human Resources Information System (HRIS) ?

(h) Define Inventory. 8×2=16

Section–B

2. (a) Define Operation Research (OR). What are its characteristics ? How is OR helpful in decision-making ?

(b) Solve by *Dual simplex method* the following LPP :

Minimize :

$$z = 5x_1 + 6x_2$$

Subject to the constraints :

$$x_1 + x_2 \geq 2$$

$$4x_1 + x_2 \geq 4$$

$$x_1, x_2 \geq 0$$ 8,8

3. (a) What is a Linear Programming Problem ? Give its mathematical formulation.

(b) Use the *revised simplex algorithm* to solve the following problem :

Minimize :

$$z = 5x_1 + 2x_2 + 4x_3$$

Subject to the constraints :

$$3x_1 + x_2 + 2x_3 \leq 4$$

$$6x_1 + 3x_2 + 5x_3 \leq 10$$

$$x_1, x_2, x_3 \geq 0$$ 8,8

Section–C

4. (a) What is Integer LPP ? Explain the Branch and Bound algorithm to solve Integer LPP.

(b) A company has three plants at locations A, B and C, which supply to warehouses located at D, E, F, G and H. Monthly plant capacities are 800, 500 and 900 units respectively. Monthly

warehouse requirements are 400, 400, 500, 400 and 800 units respectively. Unit representation costs (in Rs) are given below :

		To				
		D	E	F	G	H
From	A	5	8	6	6	3
	B	4	7	7	6	6
	C	8	4	6	6	4

Determine an optimum distribution for the company in order to minimize the total transportation cost. 8,8

5. (a) Define a dynamic programming problem. Give various applications of dynamic programming. Explain how to solve the traveling salesman problem by the Dynamic Programming Approach ?

(b) A company has a team of four salesmen and there are four districts where the company wants to start its business. The following is the profit per day in rupees for each salesman in each district :

		Districts			
		D1	D2	D3	D4
Salesmen	A	16	10	14	11
	B	14	11	15	15
	C	15	15	13	12
	D	13	12	14	15

Find the assignment of salesmen to various districts which will yield maximum profit, using the 'Hungarian Assignment Method'. 8,8

Section–D

6. (a) Highlight the relationship between data and information and information and knowledge.

Discuss some characteristics that must be possessed by "information".

(b) Give explanation. How MIS is used as a technique for making programmed decision ? Take example of a service organization. 8,8

7. (a) Differentiate between DSS, MIS and KBS with the help of suitable examples. Why is DSS more of a facility than a system ?

(b) Discuss in detail the use of computers in marketing management. Also describe briefly major markting information sub-systems. 8,8

Section–E

8. Describe the major components of typical Human Resources Information System (HRIS) and discuss the function of each of these components in providing managerial support. Illustrate your answer with a diagram showing how the HRIS relates to other corporate information systems. 16

9. Explain the following :

(a) Inventory Control System

(b) Industrial Engineering 8,8