Roll No. ..... Total No. of Pages : 3

MCA/MX 5254

Computer Oriented Optimization Techniques

Paper : MCA-204

Time : Three Hours] [Maximum Marks : 80

Note :– Question No. **1** is compulsory. Attempt **FOUR** more questions selecting **ONE** question from each Unit.

1. (a) What do you understand by redundant constraint equations ? 3

   (b) Explain briefly concept of Degencracy. 3

   (c) What is significance of Gomory's constraint ? 3

   (d) What is Kendall's Notation ? What are components of Kendall's notation ? 3

   (e) What are applications of Queuing ? 3

   (f) In what case backward pass computation is used in network model ? 3

   (g) Define Free Float, Independent Float. 3

   (h) What is crashing ? What is its significance ? 3

UNIT–I

2. (a) What are various management applications of Operations Research in India ? 7

   (b) Discuss Role on decision making and development of Operations Research in India. 7

3. (a) Explain various classifications of O.R. models. 7

   (b) Discuss advantages and limitations of Operations Research in Optimization. 7

UNIT–II

4. Consider following L.P.P.

Min. $Z = x_1 + 5x_2 + 3x_3$

sub. to $x_1 + 2x_2 + x_3 \geq 6$

$2x_1 - x_2 \leq 8$

$3x_1 + x_2 \geq 12$

and $x_1, x_2 \geq 0.$

Give its optimal solution. 14

5. What is principle of duality ? Discuss concept of Primal and Dual Problem. What are basic conditions for a problem be in primal ? What is significance of Dual Problem ? 14

UNIT–III

6. Solve the following I.P.P.

Max. $Z = 4x_1 + 2x_2$

sub. to $x_1 + x_2 \geq 9$ 14

$2x_1 + x_2 \leq 20$

$x_1, x_2 \geq 0.$

7. (a) Explain Branch and Bound method to find optimal solution of I.P.P. 7

(b) Solve following cost minimizing Assignment Problem.

	P	Q	R	S	T
A	7	7	6	11	10
B	9	12	5	8	11
C	8	5	7	6	9
D	4	3	4	5	3

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UNIT–IV

8. (a) Write short note on $M|E_k|1$ Queue and its applications. 7

(b) A customer arrives at a first class ticket counter of a theatre in a Poisson's Distributed Arrival at 30 per hour. Service time is constant at 3 minutes. Calculate Average Waiting Queue and Average Waiting Time. 7

9. (a) A research project involves designing and printing questionnaire, hiring and training personals, selecting participants, mailing questionnaire and analysis of data. Draw Network Diagram. 7

(b) Draw Critical Path for following project :

Activity	1-2	2-3	2-4	2-5	3-5	4-5
Duration	10	12	5	6	3	5

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