Roll No. ....   Total Pages : 03;

OMCA/M-17   10009

COMPUTER ORIENTED
OPTIMIZATION TECHNIQUE
MCA-204

Time : Three Hours]   [Maximum Marks : 80

Note : Q. No. 1 is compulsory. Attempt *four* more questions by selecting *one* question from Unit I to Unit IV.

1. (a) Discuss principles of modelling.   **24**

    (b) Discuss the role of decision making in modelling.

    (c) Define problem of Degeneracy and its effects.

    (d) What do you mean by formulation of linear programming problem ?

    (e) Discuss various classifications of integer programming.

    (f) What do you mean by unbalanced assignment problem ?

    (g) Explain the term M/M/I and M/CK/I.

    (h) Discuss the importance of network diagram representation.

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Unit I

2. Discuss various characteristics and phases of OR models.   **14**

3. Explain general method and their scope for solving models.   **14**

Unit II

4. Minimize $Z = x_2 - 3x_3 + 2x_5$

    subject to constraints :

    $$3x_2 - x_3 + 2x_5 \leq 6$$
    $$-2x_2 + 4x_3 \leq 13$$
    $$-4x_2 + 3x_3 + 8x_5 \leq 10$$
    $$x_1, x_3, x_5 \geq 0$$

5. Write and explain the general rule for converting any primal into its dual with example.   **14**

Unit III

6. Solve the following problem using Branch and Bound method :   **14**

    Max. $Z = 7x_2 + 9x_2$

L-10009   **2**

subject to constraints :

$$-x_1 + 3x_3 \le 6$$
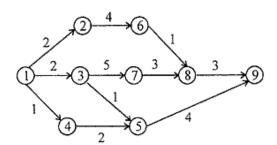
$$7x_1 + x_2 \le 35$$

$$(0 \le x_1, x_2 \le 7)$$

and x_1, x_2 are integers

7. Discuss the Hungarian method for assignment problem.

14

Unit IV

8. Draw the flow chart and explain in detail various components of Comory's all integer and programming technique. 14

9. Find the critical path and calculate the slack time for each event of the following PERT diagram :