(c) Describe different types of sequencing problems. (CO4)

5. (a) What are the basic steps in PERT/CPM Techniques ? (CO5)

(b) Explain the following terms : (CO5)

(i) Resource Allocation

(ii) Project Monitoring

(c) Give various applications of PERT/CPM Techniques. (CO5)

H Roll No. .....

TMC–303(3)

M. C. A. (THIRD SEMESTER)
END SEMESTER
EXAMINATION, Dec., 2023

OPTIMIZATION TECHNIQUES

Time : Three Hours

Maximum Marks : 100

Note : (i) All questions are compulsory.

(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.

(iii) Total marks in each main question are **twenty**.

(iv) Each sub-question carries 10 marks.

1. (a) How is Operation Research integrated with Management Applications ? (CO1)

(b) Describe interdisciplinary approach of Operation Research. (CO1)

(c) How is a problem modeled in Operation Research ? (CO1)

P. T. O.

2. (a) Find solution of the following LP problem using Simplex Method : (CO2)

Maximize :

$$z = x_1 + 2x_2$$

subject to the constraints :

$$x_1 + 2x_2 + <= 40,$$

$$x_1 - 2x_3 <= 46$$

and $x_1, x_2 >= 0$.

(b) Write mathematical formulation of Transportation Problem and prove that it is a Linear Programming Problem : (CO2)

(c) Solve the system of equations by Matrix Inversion Method : (CO2)

$$x + y + z = 1$$

$$x + 2y + 3z = 6$$

$$x + 3y + 4z = 6$$

3. (a) Describe the characteristics of Game Theory. Why is it called "as if" theory ? (CO3)

(b) Find if the following game has saddle point and apply the appropriate strategy for its solution : (CO3)

	Player B	
Player A	4	– 3
	3	6

(c) Define the following terms : (CO3)

(i) Maximin and Minimax Principle
(ii) Saddle Points
(iii) Value of Game
(iv) Zero Sum Game
(v) Pure strategy and Mixed Strategy

4. (a) What are various assumptions of Sequencing Problem ? (CO4)

(b) Find sequence that minimizes the total elapsed time (in hours) required to complete that following job on three machines M_1, M_2, M_3 in the order M1, M_2, M_3 : (CO4)

Machines	Jobs				
	A	B	C	D	E
M_1	6	8	7	10	6
M_2	3	2	5	6	4
M_3	4	8	6	7	8