



# THE AMERICAN COLLEGE, MADURAI

(An Autonomous Institution Affiliated to Madurai Kamaraj University)  
Re-accredited (2<sup>nd</sup> Cycle) by NAAC with Grade "A", CGPA – 3.46 on a 4-point scale

## Backlog Arrear Examination, March 2021

MAS 2440/2564

Marks: 75

Operations Research

Time: 3 hours

Answer any FIVE questions:

5×15=75

1. Use simplex method to solve the following LPP

$$\text{Max } z = 4x_1 + 10x_2$$

subject to

$$2x_1 + x_2 \leq 50,$$

$$2x_1 + 5x_2 \leq 100,$$

$$2x_1 + 3x_2 \leq 90,$$

$$x_1 \geq 0 \text{ and } x_2 \geq 0.$$

2. Find the optimal transportation cost for the given matrix using Least Cost method.

From/To	I	II	III	IV	supply
A	15	10	17	18	2
B	16	13	12	13	6
C	12	17	20	11	7
<b>Demand</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>5</b>	

3. Find the Assignment of salesman so as to Maximize the annual sales.

### Territories

	I	II	III	IV
A	60	50	40	30
B	40	30	20	15
C	40	20	35	10
D	30	30	25	20

4. Using Dominance property solve

### Player B

$$\text{Player A} \begin{bmatrix} -5 & 10 & 20 \\ 5 & -10 & -10 \\ 5 & -20 & -20 \end{bmatrix}$$

5. Solve the following 2 x 4 game graphically.

Player B

$$\text{Player A} \begin{bmatrix} 2 & 1 & 0 & -2 \\ 1 & 0 & 3 & 2 \end{bmatrix}$$

6. The following table indicates the details of a project

Activity	1-2	1-3	1-4	2-5	2-6	3-6	4-7	5-7	6-7
$t_o$	5	18	26	16	15	6	7	7	3
$t_m$	8	20	33	18	20	9	10	8	4
$t_p$	10	22	40	20	25	12	12	9	5

a) Determine Expected duration b) Find the expected variance c) Draw the network.

7. Determine the following :

(a) Earliest time and Latest time to reach each node

(b) Critical path of the project.

Activity	1-2	1-3	1-4	2-5	3-4	3-7	4-5	4-6	5-6	5-7	6-7
Duration	20	23	8	19	16	24	0	18	0	4	10

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