



# 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

MAT/MAS 2434/ 2553/ COM/CME – BUSINESS MATHEMATICS

Max : 75 Marks

Time : 3 Hours

Answer Any FIVE Questions (5 × 15 = 75 Marks)

1. Solve the given system of equation by Cramer's rule

$$\begin{aligned}x + 2y - z &= 2 \\3x - 4y + 2z &= 1 \\-x + 3y - z &= 4\end{aligned}$$

2. (i) If  $A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 0 & 4 \\ 0 & 2 & 2 \end{bmatrix}$  then find its inverse using adjoint matrix method

(ii) If  $A = \begin{bmatrix} 1 & -2 & 1 \\ 2 & 1 & -3 \\ -5 & 2 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 2 & 5 & -1 & -7 \\ -2 & 1 & 3 & 4 \\ 3 & 2 & 1 & 2 \end{bmatrix}$  and  $C = \begin{bmatrix} 3 & 6 & 0 & -6 \\ -1 & 2 & 4 & 5 \\ 4 & 3 & 2 & 3 \end{bmatrix}$ ,

then prove that  $AB = AC$

3. (i) Examine the function  $y = 2x^2 - x^3 + 5$  for maximum and minimum

(ii) Find  $\frac{dy}{dx}$  for (a)  $y = \frac{(x-1)^{\frac{3}{2}}(x-3)^{\frac{1}{2}}}{(x-2)^2}$  (b)  $y = e^{x^2+5x+7}$  (c)  $y^x = x^y$

4. Solve the Transportation problem by using MODI method

TO

	I	II	III	Available
A	7	3	4	2
From B	2	1	3	3
C	3	4	6	5
Demand	4	1	5	

5. Solve the following Rectangular Game

		Player B			
		I	II	III	IV
Player A	1	19	6	7	5
	2	7	3	14	6

$$\begin{array}{l} 3 \\ 4 \end{array} \left| \begin{array}{cccc} 12 & 8 & 18 & 4 \\ 8 & 7 & 13 & -1 \end{array} \right|$$

6. (i) The demand and supply functions under pure competitions are  $y = 16 - x^2$  and  $y = 2x^2 + 4$ . Find the consumer's surplus and producer's surplus.

(ii) Evaluate  $\int \frac{3x+4}{(x-2)(x+3)} dx$  using method of partial fractions.

7. Solve the Assignment Problem

		<b>Machines</b>				
		M1	M2	M3	M4	M5
Jobs	J1	9	22	58	11	19
	J2	43	78	72	50	63
	J3	41	28	91	37	45
	J4	74	42	27	49	39
	J5	36	11	57	22	25