

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

SET A

**SCHOOL OF COMMERCE
END TERM EXAMINATION - JAN 2024**

Semester : Semester I - 2023
Course Code : MAT1021
Course Name : Business Mathematics
Program : B.Com. Honors

Date : 10-JAN-2024
Time : 1:00 PM - 4:00 PM
Max Marks : 100
Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

5 X 2M = 10M

1. Which term of the Arithmetic progression 21, 18, 15, . . . is – 81?
(CO1) [Knowledge]
2. Find product of the matrix $A = \begin{bmatrix} 5 & 5 \\ 6 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 1 & 0 \end{bmatrix}$.
(CO2) [Knowledge]
3. Identify the determinant of the matrix $A = \begin{bmatrix} 5 & 8 \\ 9 & 1 \end{bmatrix}$
(CO2) [Knowledge]
4. Derive the derivative of $\log x + 3x^4$
(CO3) [Knowledge]
5. Identify the x-coordinate and y-coordinate for the following points
a). (2,3). b). (3/2, 1/2)
(CO4) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

5 X 10M = 50M

6. In which of the following situations, does the list of numbers involved make an arithmetic progression, and why?
 - a). The taxi fare after each km when the fare is ₹15 for the first km and ₹ 8 for each additional km.
 - b). The cost of digging a well after every meter of digging, when it costs ₹ 150 for the first meter and rises by ₹ 50 for each subsequent meter.

(CO1) [Comprehension]

7. Compute AB and BA if $A = \begin{bmatrix} 1 & 2 & -3 \\ 6 & 0 & 3 \\ 2 & -1 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & -1 & 3 \\ 3 & 3 & 10 \\ 2 & 0 & 3 \end{bmatrix}$ (CO2) [Comprehension]
8. Solve by using Cramer's rule $x + y + z = 7$, $2x + 3y + 2z = 17$, $4x + 9y + z = 37$. (CO2) [Comprehension]
9. Differentiate the following functions
 a). $e^{3x} \cdot \log(x)$ b). $\frac{3x+4}{5x^2-7x+9}$ (CO3) [Comprehension]
10. Locate the points A(2, 2), B(-4,4), C(-1/2,-3), D(1,0) and E(3, 0). Specify the quadrant in which each point lies. (CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

2 X 20M = 40M

11. a). Calculate the sum of the first 200 terms of the following series $1 + 4 + 6 + 5 + 11 + 6 + 16 + 7 + \dots$
 b). Mr. Kevin earns ₹400,000 per annum and his salary increases by ₹50,000 per annum. Then how much does he earn at the end of the first 3 years? (CO1) [Application]
12. Find x,y and z using matrix method $2x + y - z = 3, x + y + z = 1, x - 2y - 3z = 4$ (CO2) [Application]