Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET B

SCHOOL OF INFORMATION SCIENCE
END TERM EXAMINATION - JAN 2024

Semester : Semester I - 2023
Course Code : MAT2007
Course Name : Applied Mathematics
Program : BCA

Date : 16-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 **5X4M=20M**

1. Convert the following radian measure into degrees
a) $\frac{7\pi}{12}$ b) $\frac{3\pi}{7}$.

(CO1) [Knowledge]

2. Differentiate the function $f(x) = 4\ tanx + 2\ sinx + e^x$ with respect to x.

(CO2) [Knowledge]

3. Evaluate the definite integral $\int_0^{\frac{\pi}{6}} sinx\ dx$.

(CO3) [Knowledge]

4. If $A = \begin{bmatrix} -3 & 36 & 24 \\ 6 & 2 & 9 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 7 \\ 1 & 9 \\ 39 & 3 \end{bmatrix}$, then find $A + B^T$.

(CO4) [Knowledge]

5. Find $det(A)$ for the matrix $A = \begin{bmatrix} -2 & 5 & 4 \\ 3 & 2 & 3 \\ 4 & -1 & 1 \end{bmatrix}$.

(CO4) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS **5X10=50M**

6. If the angle θ is located in the second quadrant and value of $sin\theta = \frac{3}{5}$, then find $cos\ \theta, tan\ \theta, cot\ \theta, sec\ \theta\ \&\ cosec\ \theta$.

(CO1) [Comprehension]

7. If a line is passing through a point $(5, 2, 4)$ and parallel to a vector $3\hat{i} - 2\hat{j} + 5\hat{k}$, then find vector and cartesian form of straight line.

(CO1) [Comprehension]

8. Verify Lagrange's mean value theorem for the function $f(x) = x^2 - 4x - 3$ in the interval $(1, 4)$.

(CO2) [Comprehension]

9. Evaluate the following integral $\int (x^7 - 9 - a^x)\, dx$.

(CO3) [Comprehension]

10. Let $A = \begin{bmatrix} 2 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & -1 & 2 \end{bmatrix}$. Find the inverse of matrix A.

(CO4) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS **2X15M=30M**

11. Solve the integral by using partial fractions

$$\int \frac{6x + 13}{(x + 2)(x + 3)} dx$$

(CO3) [Application]

12. Solve the system of equations using Gauss Elimination Method $x + 3y + 6z = 12, x + 4y + 5z = 14, x + 6y + 7z = 18$.

(CO4) [Application]