PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF INFORMATION SCIENCE

MAKE UP EXAMINATION-JAN 2023

Course Code: MAT 2007 Course Name: Applied Mathematics Program: BCA Date: 20-JAN-2023 Time: 9:30AM to 12:30PM Max Marks: 100 Weightage: 50%

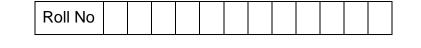
Instructions:

- (i) Read all the questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculators are permitted.

Part A

Answer all the questions. (10Qx 2M=20M)1. The order of the matrix $A = \begin{bmatrix} 2 & 4 \\ -2 & 3 \end{bmatrix}$ is _____. (C.O.No.4) [Knowledge] 2. If $A = \begin{bmatrix} 3 & 4 \\ 7 & 8 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, then A + B is _____. (C.O.No.4) [Knowledge] 3. Convert the angle measure from degrees to radians. (a) 120° (b) 45° (C.O.No.1) [Knowledge] 4. Find the value of (a) $sin(90^0 + \theta)$ (b) $cos(180^0 - \theta)$ (C.O.No.1) [Knowledge] 5. The value of $\sin^{-1}(-x)$ is _____. (C.O.No.1) [Knowledge] (C.O.No.1) [Knowledge] 6. Define direction cosines of a line. 7. Find the limit of $\lim_{x \to 0} x + 2$. (C.O.No.2) [Knowledge] 8. Differentiate x^2 w.r.t. x. (C.O.No.2) [Knowledge] 9. Find the value of $\int \cos x \, dx$. (C.O.No.3) [Knowledge] 10. Integrate the function f(x) = 4x + 2 from 0 to 2. (C.O.No.3) [Knowledge]

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Answer all the questions.

11. Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}$, by reducing into row echelon form. (C.O.No.4) [Comprehension] 12. Find the inverse of the matrix $A = \begin{bmatrix} 1 & 4 & -2 \\ -2 & -5 & 4 \\ 1 & -2 & 1 \end{bmatrix}$. (C.O.No.4) [Comprehension] 13. Find the vector and cartesian equation of the line passing through the point (5, 2, -4) and parallel to the vector $3\hat{i} + 2\hat{j} - 8\hat{k}$. (C.O.No.1) [Comprehension] 14. Verify the Rolle's theorem for the function $f(x) = x^2 - 6x + 5$ in (0, 6). (C.O.No.2) [Comprehension] 15. Evaluate the following $\int (7x + 5 + 9 e^x) dx$ (C.O.No.3) [Comprehension]

Part C

Answer all the questions.

16. Evaluate $\int \frac{3x+11}{(x+2)(x-3)} dx$ by using partial fraction method.

(C.O.No.3) [Application]

17. Solve the system of equation by Gauss elimination method

$$2x_1 + x_2 + 4x_3 = 12$$

$$4x_1 + 11x_2 - x_3 = 33$$

$$8x_1 - 3x_2 + 2x_3 = 20$$

(C.O.No.4) [Application]

(2Qx15M=30M)

