(6 pages) Reg. No. : .....

Code No. : 10668 E Sub. Code : CABA 21/ CASL 21/CAAM 21

B.B.A. (CBCS) DEGREE EXAMINATION, NOVEMBER 2023.

Second Semester

Business Administration/Shipping and Logistics Management/ Aviation Management – Allied

BUSINESS MATHEMATICS

(For those who joined in July 2021-2022)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer:

1. Find the slope of the line defined by $y - x = 5$ _____

(a) 1 (b) 1/4

(c) $-1/2$ (d) $5 + x$

2. The linear distance between –4 and 17 on the number line is _____

(a) 13 (b) 21

(c) –17 (d) –13

3. $A = \{0\}$ is _____

(a) an Universal set (b) an infinite set

(c) a singleton set (d) a null set

4. If $A = \{0,1,2,3,4,5,6\}$ and $B = \{0,1,4,5\}$, $A \cap B$ is _____

(a) A (b) B

(c) $\cup$ (d) ϕ

5. Differential calculus if $y = \frac{4x-5}{x+5}$, then $\frac{dy}{dx}$ equals _____.

(a) $\frac{20}{(x+5)^2}$ (b) $\frac{25}{(x+5)^2}$

(c) $\frac{x+5}{4x-5}$ (d) 4

6. The differential coefficient of a constant C is _____

(a) 0 (b) 1

(c) C (d) None of them

7. The derivative of the function $y = \log(4x)$ is _____

(a) $1/4x$ (b) $\log(4x)$

(c) $1/x$ (d) None of them

8. The second derivative of $y = x^n$ is _____.

(a) nx^{n+1} (b) nx^{n-1}

(c) $n(n-1)x^{n-2}$ (d) n^2x^{n-2}

9. If the number of rows of a matrix is greater than the number if columns, it is _____.

(a) a square matrix

(b) a row matrix

(c) a column matrix

(d) a rectangular matrix

10. A square matrix A is an orthogonal matrix x, if _____

(a) $AA' = I$ (b) $AA' = I$

(c) $A = A'$ (d) $A = A'$

PART B — (5 × 5 = 25 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) If $A(-3,3)$, $B(5,9)$ and $C(-7,4)$ find the distance between A and B; B and C.

Or

(b) Find the equation of the line whose slope is 3/2 and which cuts off 3 units along OY.

12. (a) What is finite set?

Or

(b) If $U = \{0,1,2,3,4,5\}$, $A = \{0,1,2\}$ and $B = \{2,4\}$. Prove that $(A \cup B)' = A' \cap B'$.

13. (a) Evaluate $\lim_{n \to \infty} \frac{2n^2 + 3n + 5}{-5n^2 + 7n + 9}$.

Or

(b) Let $y = (3x^2 - 1)^3$.

14. (a) Evaluate $\int x^{1/2} dx$.

Or

(b) Examine the cost function, $y = 40 - 4x + x^2$ for maximum or minimum.

15. (a) Define matrix.

Or

(b) Find the rank of $\begin{bmatrix} -2 & 1 & 3 & 4 \\ 0 & 1 & 1 & 2 \\ 1 & 3 & 4 & 7 \end{bmatrix}$.

PART C — (5 × 8 = 40 marks)

Answer ALL questions choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Find the ratio in which the join $(-5,1)$ and $(1,-3)$ divides the straight line passing through $(3,4)$ and $(7,8)$.

Or

(b) A straight line passes through the point $(-4,9)$ and is such that the portion of it intercepted between the axes divided at the point in the ratio 3 : 2. Find the equation.

17. (a) Explain the types of sets.

Or

(b) In a class of 25 students of Economics and Politics, 12 students have taken Economics. Out of that 8 have taken Economics but not Politics. Find the number of students who have taken Economics and Politics and those who have taken Politics but not Economics.

18. (a) Differentiae the following with respect to x. $\log_e(ax+b)$.

Or

(b) Differentiate $e^x(\log x).(2x^2+3)$ with respect to x.

19. (a) Evaluate $\int\left(3x+e^x+x^{-7/2}\right)dx$.

Or

(b) Evaluate $\int xe^{mx}dx$.

20. (a) Explain the types of Matrices.

Or

(b) If $A\begin{bmatrix} 2 & 3 & -4 \\ 6 & 7 & 8 \end{bmatrix}$, $B\begin{bmatrix} 6 & -3 & 2 \\ 5 & 0 & 8 \end{bmatrix}$ and $C=\begin{bmatrix} 1 & 2 & -3 \\ 5 & -4 & 3 \end{bmatrix}$, find

(i) $A+B-C$ (ii) $A-B+C$

(iii) $B-C+A$ (iv) $A-B-C$