

(8 pages)

Reg. No. :

Code No. : 10558 E Sub. Code : CABA 21/
CASL 21

B.B.A. (CBCS) DEGREE EXAMINATION,
NOVEMBER 2022.

Second Semester

Business Administration/Supply and Logistics
Management –Allied

BUSINESS MATHEMATICS

(For those who joined in July 2021 onwards)

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. Find the inclination of the line passing through
(-5, 3) and (10, 7)

(a) 14.73 (b) 14.93
(c) 14.83 (d) 14.63

2. What is the slope of the line $3x + 2y + 1 = 0$?

(a) $3/2$ (b) $2/3$
(c) $-3/2$ (d) $-2/3$

3. $(\overline{A \cap B}) =$ _____

(a) $A \cup B$ (b) $A \cap B$
(c) $\overline{A} \cap \overline{B}$ (d) $\overline{A} \cup \overline{B}$

4. If every element of A is an element of B and every element of B is an element of A , A and B are _____

(a) equal sets (b) universal sets
(c) null sets (d) infinite sets

5. The derivative of $y = 45$ is

(a) 4 (b) 5
(c) 0 (d) 45

6. If $y = x^5$; then $\frac{dy}{dx} =$ _____

(a) x^5 (b) $5x^4$
(c) $\frac{x^6}{6}$ (d) x^{-5}

7. A necessary condition for $f(x)$ being a maximum or a minimum at $x = a$ is
- $f(x) = 0$
 - $f'(x) = 0$
 - $f'(a) = 0$
 - none of them
8. If the total cost function is $C = 5 + 2x^2 - x^3$, marginal cost at $x = 10$ is
- 0
 - 260
 - 795
 - none of them
9. The determinate value of matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is
-
- 5
 - 2
 - 7
 - 9
10. Number of elements in a matrix of order 3×2 is
- 2
 - 3
 - 5
 - 6

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Find the equation of the line passing through (2, -5) and (-4, 5).

Or

- (b) Mr. Ram buys a radio making a payment of Rs. 200 at the time of purchase with the agreement that he will pay at the rate of Rs. 15 for the next 20 months. Find the relationship between the amount (y) he has paid and the number of months (x) since he bought the radio.

12. (a) If $A = \{1, 3, 4, 5\}$ and $B = \{1, 7, 8, 10\}$, find $A \cup B$ and $A \cap B$.

Or

- (b) If $A = \{1, 3\}$ and $B = \{5, 6, 7\}$ find $A \times B$, $B \times A$.

13. (a) Find $\frac{dy}{dx}$ if $y = 5x^3 + 9x^2$.

Or

- (b) Find the derivatives of $(x^2 - 7)^2$.

14. (a) A firm sells a product at Rs. 3 per unit. The total cost of the firm for producing X units is given by $C = 20 + 0.6x + 0.01x^2$. How many units should be made to achieve maximum profit? Verify that the condition for a maximum is satisfied.

Or

- (b) Evaluate $\int_0^2 (x^2 - 4x + 5) dx$.

15. (a) Explain the Importance of Matrix.

Or

- (b) Find $[1 \ 2 \ 3] \begin{bmatrix} 4 & 2 & 0 \\ 1 & -1 & 3 \\ 7 & 2 & 1 \end{bmatrix} \begin{bmatrix} 8 \\ 6 \\ 4 \end{bmatrix}$.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Explain the concept of market equilibrium.

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.

Page 5 Code No. : 10558 E

17. (a) A company study of the product preferences of 10,000 consumers reported that each of the products A, B, C was liked by 5015, 3465, 4827 respectively and all the products were liked by 500 people, products A and B were liked by 1000, products A and C were liked by 850 and products B and C were liked by 850 and products A and C were liked by 1420. Prove that the study results are not correct. It was found that an error was made in recording the number consumers liking the product A and C. What is the value of this numbers?

Or

- (b) All the 3200 students of a colleges in a city know at least one of the three languages – Tamil – Telugu and Malayalam, 2400 know Tamil, 1700 know Telugu, 800 know Malayalam, 1000 know Tamil and Telugu 500 know Tamil and Malayalam 300 know Telugu and Malayalam and only 100 know all these three languages.

Draw a Venn diagram and find the number of students.

Page 6 Code No. : 10558 E

- (i) Who know Tamil and Telugu but not Malayalam?
- (ii) Who know only Malayalam?
- (iii) Who know only one of the three languages and
- (iv) Who know none of these language?

18. (a) Find $\frac{dy}{dx}$ when $x^y = y^x$.

Or

(b) Find:

(i) $\frac{d}{dx} (\log ax)$

(ii) $\frac{d}{dx} \log (5x + 7)$.

(iii) $\frac{d}{dx} \log \sqrt{2x + 3}$.

19. (a) Find the maximum value of xe^{-x} .

Or

(b) Evaluate $\int \frac{x^2}{\sqrt{x^2 + 5}} dx$.

20. (a) Show that $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ satisfies the equation $A^2 - 4A - 5I = 0$.

Or

(b) Discuss the consistence of the following system

$$x + y + z = -3$$

$$3x + y - 2z = -2$$

$$2x + 4y + 7z = 7.$$