

Code No. : 12010 E Sub. Code : SMCO 42/
AMCO 42

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

Fourth Semester

Commerce – Core

BUSINESS MATHEMATICS

(For those who joined in July 2017 – 2020)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. The sum of the greatest and smallest number of five digits is
- (a) 11, 110 (b) 10, 999
(c) 109, 999 (d) 111, 110

7. If the order of matrix A is $m \times p$ and the order of B is $p \times n$. Then the order of matrix AB is?

- (a) $n \times p$ (b) $m \times n$
(c) $n \times p$ (d) $n \times m$

8. Transpose of a rectangular matrix is a

- (a) rectangular matrix
(b) diagonal matrix
(c) square matrix
(d) scalar matrix

9. The compound interest on Rs. 20,480 at 6¼% per annum for 2 years 73 days, is

- (a) Rs. 2929 (b) Rs. 3000
(c) Rs. 3131 (d) Rs. 3636

10. The simple interest on Rs. 1820 from march 9.2021 to may 21, 2021 at 7½ % rate will be

- (a) Rs. 22.50 (b) Rs. 27.30
(c) Rs. 28.80 (d) Rs. 29

2. All natural numbers and 0 are called the _____ numbers.

- (a) rational (b) integer
(c) whole (d) prime

3. The logarithm of 0.00001 to the base 0.01 is equal to

- (a) $-5/2$ (b) $5/2$
(c) 3 (d) 5

4. Determine the value of $\log_{3\sqrt{2}} \left[\frac{1}{18} \right]$.

- (a) 2 (b) -2
(c) $\sqrt{2}$ (d) $\sqrt{3}$

5. If the median drawn on the base of a triangle is half its base, the triangle will be,

- (a) right angled (b) acute angled
(c) obtuse angled (d) equilateral

6. A point lying inside a triangle is equidistant from the vertices of the triangle. Then the triangle has as its

- (a) Centroid (b) Incentre
(c) Orthocentre (d) Circumcentre

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

11. (a) Solve $\frac{2}{x-1} + \frac{1}{x+5} = \frac{3}{x+4}$.

Or

- (b) Solve the following equations:

$$3x + 7y = 13 \text{ and } 5x - 2y = 8.$$

12. (a) Find the distance between the following pair of points.

- (i) (2, 3), (1, 3)
(ii) origin, (-2, 3).

Or

- (b) Simplify the following:

(i) $\left(\frac{3x^2}{y^2} \right)^5$

(ii) $7^5 \div 7^2$.

13. (a) Show that the line joining the points (2,3) and (4,2) is perpendicular to the joining the points (5,3) and (6,5).

Or

- (b) Find that the points $P(1,1)$, $Q(-1,-1)$ and $R(-\sqrt{3},\sqrt{3})$ are the vertices of an equilateral triangle.

14. (a) If $A = \begin{bmatrix} 3 & 7 \\ 4 & 8 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 5 \\ 6 & -3 \\ 4 & 11 \end{bmatrix}$, find $A-B$ and $B-A$.

Or

- (b) If $A = [1 \ 2 \ -3]_{1 \times 3}$ and $B = \begin{bmatrix} 8 \\ -5 \\ -2 \end{bmatrix}_{3 \times 1}$ find AB .

15. (a) On what date will Rs. 2,208 be repaid for a sum of Rs. 2,190 borrowed on 1st Feb, 1963 at 5% p.a. simple interest?

Or

- (b) Find compound interest in following cases.
 (i) On Rs. 10,000 for 2 years at 10% p.a. paid annually.
 (ii) On Rs. 6,000 for $2\frac{1}{2}$ years at 10% p.a. paid annually.

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PART C — (5 × 8 = 40 marks)

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

16. (a) Solve the following equations:

$$2x + 5y = 9$$

$$3x - y = 5$$

Or

- (b) A doctor charges Rs. 10.50 for 4 visits and 5 bottles of medicine. He also charges Rs. 15 for 6 visits and 6 bottles of medicine, find his charge for one visit and the cost of medicine per bottle.

17. (a) Find the logarithms of

(i) 0.1 to the base 10

(ii) $\sqrt[3]{25}$ to the base 5.

Or

- (b) Simplify

(i) $\left(\frac{x^{-3}y}{x^2y^{-3}}\right)\left(\frac{x^{-2}y^{-1}}{x^3y^3}\right)^2$

(ii) $\frac{a^{m+2n} \cdot a^{3m-8n}}{a^{4m-6n}}$

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18. (a) Find the equation to the line passing through (-2, 5) and perpendicular line $3x - 4y + 7 = 0$.

Or

- (b) Show that the points (2,-2), (8,4), (5,7) and (-1,1) are the vertices of a rectangle.

19. (a) Let $A = \begin{bmatrix} 3 & 6 \\ 7 & 0 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 7 \\ 8 & 4 \end{bmatrix}$ and $C = \begin{bmatrix} 5 & 4 \\ 1 & 9 \end{bmatrix}$ verify that $A+B-C = A+(B-C)$.

Or

- (b) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix}$ verify $(A+B)^T = A^T + B^T$.

20. (a) A man lent at simple interest Rs. 1,600 partly at 8% and partly at 9% p.a. if the total interest received after one year is Rs. 140, how much did he lent at 8%.

Or

- (b) A sum of money put out a compound interest amounts in 2 years to Rs. 2,809 and in three years to Rs. 2,977.54. Find the rate of interest and the original sum.

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