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Reg. No. :

Code No. : 22084 E Sub. Code : SMCO 42/
AMCO 42

n. (CBCS) DEGREE EXAMINATION, APRIL 2022

Fourth Semester

Commerce — Core

BUSINESS MATHEMATICS

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

The general form of Quadratic equation is _____

- (a) $ax^2 + bx + c = 0$ (b) $x + y = 0$
 (c) $x + y + c = 0$ (d) all the above

$\sqrt{2}$ is _____ number.

- (a) a natural (b) a whole
 (c) a rational (d) an irrational

If A is a 2×3 matrix, B is a 3×2 then $A + B$ is _____ matrix.

- (a) 2×2 (b) 3×3
 (c) 3×2 (d) not defined

Simple interest $SI =$

- (a) $\frac{pnr}{100}$ (b) $p + n + \frac{r}{100}$
 (c) $p\left(1 + \frac{r}{100}\right)^n$ (d) $p\left(1 - \frac{r}{100}\right)^n$

Simple interest on 20,000 at 2% p.a. for one year is _____

- (a) 4,800 (b) 4,000
 (c) 800 (d) 400

PART B — (5 × 5 = 25 marks)

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

Each answer should not exceed 250 words.

- (a) Find the quadratic equation whose roots are $x = \frac{1}{4}$ and $x = -1$.

Or

- (b) Show that $\sqrt{2}$ is an irrational number.

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3. $(2x)^0 =$ _____

- (a) -1 (b) 1
 (c) 0 (d) 4

4. Write the following in the log form : $5^3 = 125$

- (a) $\log_3 125 = 5$ (b) $\log_{125} 3 = 5$
 (c) $\log_5 125 = 3$ (d) $\log_5 3 = 5$

5. The distance between the points (0, 0) and (-2, 3) is

- (a) $\sqrt{2}$ (b) $11\sqrt{2}$
 (c) $\sqrt{13}$ (d) 5

6. The slope of the line $y = 2x + 3$

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

7. A matrix in which there is only one row is called _____ matrix.

- (a) Unit (b) Column
 (c) Scalar (d) Row

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12. (a) Subtract $3x^2 - 5$ from $5x^2 - 6$.

Or

(b) Add $5x^2 - 6$ with $3x^2 - 5$.

13. (a) Simplify : (i) $2^{-4}2^{-5}$ (ii) $5a^0$.

Or

(b) Find the equation of the line passing through the points (2, -3) and (-4, 5).

14. (a) Find the adjoint of the matrix $\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$.

Or

(b) If $A = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 2 & 1 \\ 0 & 1 & 3 \end{bmatrix}$ prove that $A + B = B + A$.

15. (a) Find the value of x in the proportion : $(6x + 2) : (7x + 4) = 4 : 5$.

Or

(b) Define an annuity and explain its types.

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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) From the following equations find :

(i) The sum of two roots.

(ii) The product of two roots.

(1) $x^2 - 5x + 2 = 0$

(2) $2x^2 + 9x + 4 = 0$

(3) $x^2 - x - 6 = 0$.

Or

(b) Solve the following system of equations.

$$x + y + z = 6; 3x - 2y + z = 2; x + y + z = 0.$$

17. (a) If $2^{x+1} + 3 \cdot 2^{x-3} = 76$ find the value of x .

Or

(b) If $\log \frac{a+b}{2} = \log(2(ab)) - \log(a+b)$ show that $a = b$.

18. (a) Find the equation of the line whose slope is $\frac{3}{2}$ and which cuts off 3 units along y axis.

Or

(b) Find the equation of the line through the point $(1, -2)$ and parallel to the line $3x - y + 7 = 0$.

19. (a) If $A = \begin{bmatrix} 2 & 2 \\ 3 & 5 \end{bmatrix}$ find A^{-1} .

Or

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

verify that $4(A + B) = 4A + 4B$.

20. (a) Calculate the compound interest on Rs. 7,500 for $3\frac{1}{2}$ years at 5.5% p.a.

Or

(b) The difference between the simple interest and the compound interest is Rs. 384.60 in 4 years. Find out the sum.