(6 pages)

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

Third Semester

Economics — Core

MATHEMATICS FOR ECONOMICS — I

(For those who joined in July 2021 onwards)

Time : Three hours   Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. LCM of 6 and 10 is

    (a) 60   (b) 30

    (c) 10   (d) 6

2. The number without fraction is called

    (a) real number   (b) irrational numbers

    (c) integers   (d) event numbers

3. Add $4x^2y, -3x^2y, -7xy^2, 7xy^2$

    (a) x^2y (b) xy^2

    (c) xy (d) $-x^2y$

4. The 8th term of an A.P 3, 5, 7, 9 is

    (a) 17   (b) 19

    (c) 21   (d) 15

5. Empty set is a ————

    (a) Infinite set   (b) Finite set

    (c) Unknown set   (d) Universal set

6. If A, B and C are any three sets, then $A \times (B \cup C)$ is equal to

    (a) $(A \times B) \cup (A \times C)$

    (b) $(A \cup B) \times (A \cup C)$

    (c) $(A \times B) \cap (A \times C)$

    (d) None of the above

7. The graph of quadratic equation is a

    (a) Straight line   (b) 'U' shaped curve

    (c) Vertical line   (d) 'L' shaped curve

8. In economics, demand curve is an example for _____ equation.

   (a) Linear   (b) Quadratic

   (c) Bi-quadratic   (d) Polynomial

9. The slope of a straight line $ax + by + c = 0$ is

   (a) $\dfrac{c}{a}$ (b) $\dfrac{c}{b}$

   (c) $\dfrac{b}{a}$ (d) $-\dfrac{a}{b}$

10. If two lines are perpendicular, the value of the product if their slope is _____

    (a) 0   (b) 1

    (c) −1   (d) ∞

PART B — (5 × 5 = 25 marks)

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

11. (a) Explain the following types of numbers with example (i) natural number (ii) whole number (iii) integers (iv) fractions (v) rational numbers.

    Or

    (b) Solve the following :

    (i) $(132)^7 \times (132)^? = (132)^{11.5}$

    (ii) $(6)^{6.5} \times (36)^{4.5} \div (216)^{4.5} = (6)^?$.

12. (a) Find the sum of the geometric series $2 + 6 + 18 + 54 + \cdots$.

    Or

    (b) Explain different types of Algebraic expression with example.

13. (a) If $A = \{1, 3, 5\}$ and $B = \{2, 3\}$, then find : (i) $A \times B$ (ii) $B \times A$ (iii) $A \times A$ (iv) $(B \times B)$.

    Or

    (b) Demonstrate Cartesian product of two sets with an example.

14. (a) Solve the following quadratic equation : $2x^2 - 7x + 3$.

    Or

    (b) Given the demand function as $Qd = 10 - P$ and supply function as $Qs = -5 + 2p$, calculate equilibrium price (P) and quantity (Q).

15. (a) If a line passes through (2, −5) and (4, 6) find the equation for the line

    Or

    (b) Find the equation of the line that has a slope of 1/3 and contains the point (2, −1).

PART C — (5 × 8 = 40 marks)

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

16. (a) If $4^{(x-y)} = 64$ and $4^{(x+y)} = 1024$, then find the value of x.

Or

(b) Describe the laws of indices and surds.

17. (a) Find the sum of the series $1 + 3.5 + 6 + 8.5 + \cdots + 101$.

Or

(b) Find the value of the following expressions at $a = 1$ and $b = -2$ (i) $a^2 + b^2 + 3ab$ (ii) $a^3 + a^2 b + ab^2 + b^3$.

18. (a) Explain the types of sets with examples.

Or

(b) If the universal set is given by $S = \{1,2,3,4,5,6\}$, $A = \{1,2\}$, $B = \{2,4,5\}$ and $C = \{1,5,6\}$ are three sets, find (i) $A \cup B$ (ii) $A \cap B$ (iii) A' (iv) B' and (v) check $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.

19. (a) Find the solution of the simultaneous equations $6x - 5y = 10$ and $3x + 2y = 23$.

Or

(b) Describe the different types of functions with example.

20. (a) Examine the application of analytical Geometry in economics.

Or

(b) If the line joining the points $(-2, 5)$ and $(6, a)$ are perpendicular to the line joining the points $(2, -1)$ and $(8, 3)$, find a.

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