24U347 (Pages: 2) Name : .....

Reg. No : .....

THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2025

(FYUGP)

CC24UECO3CJ201 - ANALYTICAL TOOLS FOR ECONOMICS - I

(B.A. Economics - Major Course)

(2024 Admission - Regular)

Time: 2.0 Hours Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)

Answer ***all*** questions. Each question carries 3 marks.

1. Differentiate Logarithmic function and logarithmic Linear Functions. [Level:1] [CO1]

2. Explain the concept of linear graph and the parabolic graph. [Level:1] [CO1]

3. The demand for commodity is D= 35-7P . The supply function is S=2P-5 . Find the equilibrium Price. [Level:1] [CO1]

4. Evaluate $\lim_{x \to 1} x^5 + 7$. [Level:2] [CO2]

5. Find the derivative of $y = x^3 + 2x$. [Level:2] [CO2]

6. If $z = 2x^2 - 3xy + 4y^2$ find $\frac{\partial z}{\partial x}$. [Level:2] [CO2]

7. Find the slope of the line $y = 7x - 10$ at the point $(2, 4)$. [Level:2] [CO2]

8. Evaluate the following integral (i) $\int dx$. (ii) $\int \frac{1}{x} dx$. [Level:2] [CO3]

9. Find the area under the curve $y = 3x^2 + 2$ between the ordinates at $x = 2$to $x = 4$. [Level:2] [CO3]

10. Define a scalar matrix. Give an example. [Level:1] [CO4]

(Ceiling: 24 Marks)

Part B (Paragraph questions/Problem)

Answer ***all*** questions. Each question carries 6 marks.

11. If $S = \{a, b, c, d, e, f, g, h\}, A = \{a, b, c, d, e\}, B = \{c, d, e, f\}$ and $C = \{a, e, f, g\}$ show that [Level:2] [CO1]

    1. $(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$.
    2. $(A \cap B) \cup C = (A \cup C) \cap (B \cup C)$.
    3. $(A \cup B)^C = A^C \cap B^C$

12. Explain the concept of functions and write down the major types of functions. [Level:1] [CO1]

13. Revenue function of a firm is given by $R = 14x - x^2$. Find the marginal revenue when 4 units are sold. [Level:2] [CO2]

14. Find y'' at $(1, 3)$ where $y = 3x^3 - 2x^2 + x - 10$. [Level:2] [CO2]

15. Use method of substitution to evaluate the integral $\int 3x^2 e^{x^3} dx$. [Level:1] [CO3]

16. Consider the function $f(x) = x^2$ on $[1, 3]$. Find the average value of $f(x)$ on the interval $[1, 3]$. [Level:2] [CO3]

17. Find the value of the determinant $\begin{vmatrix} 1 & 2 & -3 \\ 2 & -1 & 2 \\ 3 & 2 & 4 \end{vmatrix}$. [Level:2] [CO4]

18. If $A = \begin{bmatrix} 2 & 0 & 3 \\ 7 & 6 & 0 \\ 1 & -1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 9 & 0 \\ 0 & -3 & 1 \\ 7 & 6 & 4 \end{bmatrix}$. Show that $(A + B)^T = A^T + B^T$ [Level:2] [CO4]

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any ***one*** question. The question carries 10 marks.

19. Differentiate the following functions (i) $y = (x + 1)e^x$. (ii) $y = \dfrac{x^3 - 2x + 3}{2 - x^3}$. [Level:2] [CO2]

20. Solve using Cramer's rule $\begin{aligned} 3x + 2y + z &= 6 \\ 2x - 3y + 3z &= 2 \\ x + y + z &= 3 \end{aligned}$. [Level:2] [CO4]

(1 × 10 = 10 Marks)

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