

QP CODE: D3BEC2402

(Pages: 2)

Reg. No : .....

Name : .....

**THIRD SEMESTER FYUGP EXAMINATION, NOVEMBER 2025**

**Discipline Specific Core (DSC) Courses - Major**

**ECO3CJ201 : Analytical Tools for Economics-I**

**(Credits: 4)**

**Time: 2 Hours**

**Maximum Marks: 70**

**Section A**

**Answer the following questions. Each carries 3 marks (Ceiling: 24 marks)**

- |   |         |
|---|---------|
| 1. Define Logarithmic functions and Exponential function with example.  | BL1 CO1 |
| 2. How do you derivative of inverse function. Give an example.  | BL3 CO2 |
| 3. Define consumer surplus and producer surplus in connection with integral.  | BL1 CO3 |
| 4. Find adjoint of the matrix $A = \begin{bmatrix} 4 & 2 \\ -3 & 1 \end{bmatrix}$ .   | BL1 CO4 |
| 5. If $A = (1,2,3)$ $B = (a,b)$ . Find $A \times B$ and $B \times A$ . Are they equal?  | BL1 CO1 |
| 6. If $y = e^{2x}$ , find second order derivative with respect to x.  | BL2 CO2 |
| 7. Define derivative and differentiation.   | BL2 CO2 |
| 8. Evaluate $\int_0^1 (x + 1) dx$ by using first fundamental theorem of calculus.   | BL2 CO3 |
| 9. Define rank of a matrix.   | BL1 CO4 |
| 10. Two shops have the stock of large, medium and small sizes of a tooth paste. The number of each size stocked is given by the matrix. | BL4 CO4 |

	<i>large</i>	<i>medium</i>	<i>small</i>
<i>Shop1</i>	150	24	120
<i>Shop2</i>	90	300	210

The cost matrix,  $B$  of the different size of the toothpaste is given by

$$\begin{bmatrix} 14 \\ 10 \\ 6 \end{bmatrix}. \text{ Find the investment in tooth paste by each shop.}$$

**(PTO)**

## Section B

**Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)**

- |     |   |     |     |
|-----|---|-----|-----|
| 11. | Find the equilibrium prices and quantities for the two commodities whose demand and supply functions are<br>$xd_1 = -2 - p + q, xs_1 = -2 - q, xd_2 = -3 - p - q, xs_2 = -9 + p + q.$ | BL3 | CO1 |
| 12. | Evaluate<br><br>1. $\int_2^4 (3x - 2)^2 dx$<br>2. $\int_6^{10} \frac{dx}{x+1}$  | BL3 | CO3 |
| 13. | Show that $\frac{x^2-4}{x-2}$ is continuous at $x = 2$ .  | BL3 | CO2 |
| 14. | Solve the linear equations by cramer's rule,<br>$2x + y = 5$<br>$x - y = 1$   | BL3 | CO4 |
| 15. | Let $A = \begin{bmatrix} 3 & 4 \\ 1 & -2 \\ 0 & 5 \end{bmatrix}, B = \begin{bmatrix} 2 & 0 & 4 \\ 1 & -3 & 6 \end{bmatrix}$ . Find $A \times B$ and $B \times A$ .                    | BL1 | CO4 |
| 16. | Graph the function $y = \frac{1}{x}$ over the interval $(-3, 3)$ .  | BL4 | CO1 |
| 17. | What is single variable and multivariable optimisation. Give example.   | BL2 | CO2 |
| 18. | Explain with example a) Union b) Intersection c) Difference d) Disjoint e) Compliment of a set.   | BL3 | CO1 |

## Section C

**Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)**

- |     |   |     |     |
|-----|---|-----|-----|
| 19. | Find value of the determinant $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & -1 & 2 \\ 3 & 2 & 4 \end{bmatrix}$ | BL3 | CO4 |
| 20. | Find first and second order partial derivatives of $u = \log(x^2 + y^2)$ .                              | BL3 | CO2 |

**CO : Course Outcome**

**BL : Bloom's Taxonomy Levels** (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)