N – 7581

(Pages : 4)

Reg. No. : .....

Name : .....



Fourth Semester B.A. Degree Examination, August 2022

First Degree Programme under CBCSS

Economics

Core Course IV

EC 1441 : BASIC TOOLS FOR ECONOMICS I

(2015 & 2018 Admission)

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer in one or two sentences. Attempt **all** questions.

1. Continuous Variable
2. Optimisation
3. Cross price elasticity
4. Identity matrix
5. Cubic function
6. Partial differentiation
7. Parameter
8. Co-factor matrix
9. Indefinite integral
10. Consumer surplus

(10 × 1 = 10 Marks)

P.T.O.

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SECTION – II

Answer **any eight** questions not exceeding one paragraph. Each question carries **2** marks.

11. Explain the slope of a linear function.

12. Given the total cost function $C = 6x + \frac{1}{3}x^2 + 3$, where '$x$' is the units of output produced, find fixed cost and marginal cost.

13. Find $\int(4x - 6)dx$.

14. Differentiate diagonal matrix and scalar matrix.

15. Find price elasticity of demand at $p = 2$ for the linear demand function $P = 8 - 0.5q$ where 'p' is the price and 'q' is the quantity demanded.

16. Solve $x^2 + 3x - 10 = 0$ by applying the method of factorisation.

17. Find the value of x at which the function $y = 2x^3 - 3x^2 + 7$ can have a maxima/minima.

18. Explain cubic function with an example.

19. Find determinant of matrix $A = \begin{bmatrix} 6 & -2 & 0 \\ 2 & 5 & -1 \\ 1 & 4 & -3 \end{bmatrix}$.

20. What do you mean by logarithmic function.

21. Explain Elasticity of demand.

22. Find $\frac{\partial y}{\partial x}$ given the function $y = x^3 - 2x^2y + y^3 - 4$.

(8 × 2 = 16 Marks)

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SECTION – III

Answer **any six** questions not exceeding **120** words. Each question carries **4** marks.

23. Find AB where

$$A=\begin{bmatrix}2 & -4\\ 5 & 3\end{bmatrix}\ B=\begin{bmatrix}6 & 1\\ -2 & -8\end{bmatrix}$$

24. Find the adjoint of

$$A=\begin{bmatrix}4 & -3 & 1\\ 2 & 0 & 5\\ -6 & -4 & 7\end{bmatrix}$$

25. Explain major applications of integration in economics.

26. Find the total differential of $z=12x^2+10y$

27. The demand function for good X is $Q=30-0.4P$. Let the total cost of production of X is given by the function $C=120+1.25Q^2$. Obtain the level of output at which firm maximises its profit.

28. Describe various functions used in economic modelling.

29. Prove that the condition $A^{-1}A=AA^{-1}$ is satisfied for the square matrix $\begin{bmatrix}2 & 5\\ -3 & 4\end{bmatrix}$.

30. What are the properties of determinants?

31. Write a note on Rank of a matrix.

(6 × 4 = 24 Marks)

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SECTION – IV

Answer **any two** questions not exceeding **4** pages. Each question carries **15** marks.

32. Solve the given system of equations using Cramer's rule.

$$2x + y - z = -2$$
$$x + 3y = 7$$
$$2y + 2z = 8$$

33. Optimise the function $y = 3x^3 + 6x^2 - 5x + 2$ and state whether the function has both maxima and minima.

34. Write an essay on the economic application of Differential calculus.

35. Explain the role of mathematics in economic analysis.

(2 × 15 = 30 Marks

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