ALL SAINTS COLLEGE LIBRARY TRIVANDRUM

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J – 1109

Reg. No. : .....

Name : .....

Fourth Semester B.A. Degree Examination, March 2020

First Degree Programme Under CBCSS

Economics

Core Course IV

EC 1441 : BASIC TOOLS FOR ECONOMICS — I

(2015 Admission Onwards)

Time : 3 Hours

Max. Marks : 80

SECTION – I

Answer in **one** or **more** sentences. Attempt **all** questions :

1. Diagonal matrix.
2. Determinant.
3. Marginal utility.
4. Cross elasticity of demand.
5. Linear equation.
6. Consumption function.
7. Rank of a matrix.
8. Limit of a function.

P.T.O.

9 Exogenous variable.

10 Break-even point.

(10 × 1 = 10 Marks)

SECTION – II

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

11. Distinguish between a constant and variable.

12. State the conditions of maxima.

13. Distinguish between symmetric matrix and skew-symmetric matrix.

14. Explain the relationship between AC and MC.

15. Explain the limit of a polynomial function.

16. Define a definite integral.

17. Distinguish between exponential function and logarithmic function.

18. Define inverse of a matrix.

19. What is meant by monotonically increasing and decreasing function.

20. Explain different types of elasticity of demand.

21. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ show that $A^2 - 5A + 7I = 0$.

22. Find the total differential of the function $x^2 + y^2 / x - y$.

(8 × 2 = 16 Marks)

SECTION – III

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

23. Explain the role of mathematics in economic theory.

24. State the rules of differentiation.

25. Write a short note on economic applications of differential calculus.

26. Find AB and BA if $A = \begin{bmatrix} 4 & 6 & 2 \\ 1 & 7 & 4 \\ 3 & 9 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 8 \\ 7 \\ 1 \end{bmatrix}$.

27. Briefly explain constraint maximization.

28. Examine the main properties of determinant.

29. Define the following scalar matrix, triangular matrix, unit matrix and idempotent matrix.

30. Find the extreme value of the function $Y = 3x^3 + 3x^2 - 12x$.

31. Find the inverse of matrix $A = \begin{bmatrix} 1 & 3 & 3 \\ 1 & 4 & 3 \\ 1 & 3 & 4 \end{bmatrix}$.

(6 × 4 = 24 Marks)

SECTION – IV

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

32. State the conditions of maximum and minimum value of a function. Find the maxima and minimum value of the function $x^3 - 6x^2 + 9x - 5$.

33. Briefly explain rules of integral. Examine the applications of integral caloulus in economics.

34. Solve the following equation using crammers rule.

$$x + y + z = 7$$
$$x + 2y + 3z = 16$$
$$x + 3y + 4z = 22$$

35. State the methods of solving a general quadratic equation and solve $(x-2)^2 - (x-2) - 2 = 0$.

(2 × 15 = 30 Marks)