



186
K23U 4009

Reg. No. :

Name :

I Semester B.A. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/
Improvement) Examination, November 2023
(2019 Admission Onwards)

Complementary Elective Course in Economics/Development Economics
1C01 ECO/DEV ECO : MATHEMATICS FOR ECONOMIC ANALYSIS 1

Time : 3 Hours

Max. Marks : 40

PART – A

Answer **all** the **6** questions. **Each** carry **one** mark.

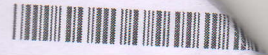
1. Give the definition of an increasing function and give an example.
2. Evaluate $\lim_{x \rightarrow 2} x^3 - 3x + 1$.
3. Find the expression for x if $y = e^x$ and hence find the value of x when $y = 1$.
4. Find the equilibrium price P^e if the demand function $D = 100 - P$ and supply function $S = 10 + 2P$.
5. Define a multivariable function with example.
6. Define a continuous function. Find the point of discontinuity of the function $y = 1/x$.

PART – B

Answer **any 6** questions. **Each** carry **2** marks.

7. Give the expression for Marginal Revenue (MR) using derivatives. Find MR if total revenue $TR = 75Q - 4Q^2$.
8. Find the slope of the line $5x + 4y + 7 = 0$.
9. Find $f'(x)$ if $f(x) = x^3 \cos x$.
10. What do you mean by a quadratic function ? Give an example.

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11. Evaluate $\lim_{x \rightarrow -5} \frac{x^2 + 2x - 1}{x + 5}$.
12. Find the Marginal Expenditure (ME) function associated with the supply function $P = Q^2 + 2Q + 1$ and evaluate it when $Q = 3$.
13. What is meant by constrained optimisation ?
14. Find the partial derivative Z_{xy} if $Z = x^2 + 3xy + y^2$.

PART - C

Answer **any 4** questions. **Each** carry **3** marks.

15. Draw the graph of the parabola $y = 4x^2$.
16. Check for the concavity of the function $f(x) = 3x^2 - 7x + 15$ at $x = 2$.
17. Find the relative minimum and maximum values of the function $y = -7x^2 + 126x - 23$.
18. Check whether the function $f(x) = 4x^3 + 3x^2 - 12x + 13$ is increasing at $x = 3$.
19. Find $\frac{dy}{dx}$ if $y = \cos(x^2 + 1)$.
20. Find the total differential of z if $z = x^4 + 8xy + 3y^3$.

PART - D

Answer **any 2** questions. **Each** carry **5** marks.

21. Explain the application of graphs and functions in economics with suitable examples.
22. Maximize profits π for a firm, given total revenue $R = 4000Q - 33Q^2$ and total cost $C = 2Q^3 - 3Q^2 + 400Q + 5000$, where $Q > 0$.
23. Find the relative maximum point and relative minimum points of z by finding the critical points. $z = 2y^3 - x^3 + 147x - 54y + 12$.
24. Write a short note on the following Economic functions : a) Supply function b) Cost function c) Revenue function d) Profit function e) Utility function.