K24U 0103

Reg. No. : ....

Name : ....

Sixth Semester B.A. Degree (C.B.C.S.S.-OBE – Regular/Supplementary/ Improvement) Examination, April 2024
(2019 to 2021 Admissions)
CORE COURSE IN ECONOMICS/DEVELOPMENT ECONOMICS
6B12ECO/DEV ECO : Basic Tools for Economic Analysis – II

Time : 3 Hours   Max. Marks : 40

PART – A

Answer **all** questions. **Each** question carries **1** mark.

1. What do you mean by non-singular matrix ?

2. State the meaning of derivative.

3. Define limit of a function.

4. What is meant by regressor ?

5. Define trend.

6. What do you mean by price index ?   **(6×1=6)**

PART – B

Answer **any six** questions. **Each** question carries **2** marks.

7. Given $A = \begin{bmatrix} 5 & 4 & 8 \\ 3 & 2 & 6 \\ 9 & 7 & 1 \end{bmatrix}$. Find 5 A.

8. Given $A = \begin{bmatrix} 2 & 3 \\ 6 & 8 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 4 \\ 5 & 7 \end{bmatrix}$ $C = \begin{bmatrix} 9 & 7 \\ 6 & 2 \end{bmatrix}$

   prove that $(A + B) + C = A + (B + C)$.

9. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ given $z = 7x^3 + 13x^2y + 19xy$.

P.T.O.

10. Given the total cost function $C = 35 + 5Q - 2Q^2 + 2Q^3$, find the marginal cost and evaluate it at $Q = 3$.

11. Explain the rank correlation coefficient.

12. What is simple linear regression ?

13. Distinguish between seasonal variations and cyclical variations.

14. What is meant by time reversal test ? **(6×2=12)**

PART – C

Answer **any four** questions. **Each** question carries **3** marks.

15. Find the determinant of the matrix $A = \begin{bmatrix} 3 & 6 & 5 \\ 2 & 1 & 8 \\ 7 & 9 & 1 \end{bmatrix}$.

16. Given the total cost function $C = Q^3 - 5Q^2 + 60Q$, find the critical value at which AC is minimized.

17. Find the marginal productivity of labour and capital given the production function $Q = 0.5 K^2 + 2KL + L^2$ and evaluate the marginal productivities at $K = 2$ and $L = 4$.

18. Find Pearson's correlation coefficient given :

X	1	2	3	4	5	6	7	8	9	10
Y	2	4	8	7	10	5	14	16	2	20

19. Find Fisher's index number.

Commodity	Base Year Price	Base Year Quantity	Current Year Price	Current Year Quantity
A	15	15	22	12
B	20	5	27	4
C	4	10	7	5

20. Explain the moving average method of measuring trend. **(4×3=12)**

PART – D

Answer **any two** questions. **Each** question carries **5** marks.

21. Use Cramer's rule to solve for the unknowns in the following :

    $2x_1 + 4x_2 - x_3 = 52$

    $-x_1 + 5x_2 + 3x_3 = 72$

    $3x_1 - 7x_2 + 2x_3 = 10$

22. Given the revenue function $R = 1400Q - 6Q^2$ and the total cost function $C = 1500 + 80Q$, find the critical value at which profit is maximized, and the maximized profit.

23. Find the least square regression line of Y on X :

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

24. The following are the annual profits in thousands of rupees in a certain business :

Year	1951	1952	1953	1954	1955	1956	1957
Profits	63	72	75	65	80	85	95

    Use the method of least squares to fit a straight-line trend. **(2×5=10)**