K22U 1209

II Semester B.A. Degree (C.B.C.S.S.– O.B.E. – Regular/Supplementary/ Improvement) Examination, April 2022
(2019 Admission Onwards)
COMPLEMENTARY ELECTIVE COURSE IN ECONOMICS/DEVELOPMENT ECONOMICS
2C02 ECO/DEV ECO : Mathematics for Economic Analysis – II

Time : 3 Hours   Max. Marks : 40

PART – A

Answer **all** questions. **Each** carries **one** mark :

1. What are elements of a matrix ?

2. Find $\int dx$.

3. What is orthogonal matrix ?

4. What is non-singular matrix ?

5. What is power of a matrix ?

6. What is transpose of a matrix ?   (6×1=6)

PART – B

Answer **any six** questions. **Each** carries **two** marks :

7. What is consumer surplus ?

8. Differentiate between identity matrices and null matrices.

9. Differentiate between minor and cofactor of a matrix.

10. What is eigenvalue ?

11. Differentiate between diagonal and non-diagonal matrix.

12. State any two properties of definite integral.

13. Find $\int 10\, x^3\, dx$.

14. Marginal cost function is given as MC = $3Q^2 - 4Q + 6$ and total fixed cost is 8. Find the total cost.

(6×2=12)

PART – C

Answer **any four** questions. **Each** carries **three** marks :

15. Evaluate $\begin{vmatrix} 5 & -1 & 2 \\ 3 & 0 & 1 \\ 4 & 2 & 3 \end{vmatrix}$.

16. Use discriminants to determine whether the following quadratic equation is positive or negative definite $Y = 5x_1^2 - 2x_1x_2 + 7x_2^2$.

17. Find $\int x \ln x\, dx$.

18. Explain the economic applications of indefinite integral.

19. If producers supply function is given by $Q = \sqrt{-4 + 4P}$ and market price is 10. Find the producers surplus.

20. Find the rank of the matrix A from its echelon matrix and comment on whether the matrix is singular or not $A = \begin{vmatrix} 1 & 5 & 1 \\ 0 & 3 & 9 \\ -1 & 0 & 0 \end{vmatrix}$.

(4×3=12)

PART – D

Answer **any two** questions. **Each** carries **five** marks :

21. Given the marginal cost function $MC = 3Q^2 - 4Q + 6$ and the total fixed cost 8. Find TC and AC. Can we claim that the average cost is minimum when $Q = 2$?

22. Find the characteristic root and vectors of the matrix $\begin{vmatrix} 2 & 2 \\ 2 & -1 \end{vmatrix}$ and verify the above

   matrix that can be diagonalised into the matrix $\begin{vmatrix} r_1 & 0 \\ 0 & r_2 \end{vmatrix} = \begin{vmatrix} 3 & 0 \\ 0 & -2 \end{vmatrix}$.

23. Economic applications of definite integrals.

24. Using Cramers rule, solve

   $2x_1 + 4x_2 - x_3 = 52$

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

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

   (2×5=10)