SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Statistics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - II
**20USTCT2004 - Matrix Algebra**

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

## Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain the various types of matrices.
2. Define matrix multiplication and illustrate with an example. State two properties of matrix multiplication.
3. Explain how to convert a given matrix to its echelon form. Provide an example.
4. State and prove any two properties of determinants.
5. Show that every homogeneous system of linear equations has at least one solution.
6. State the properties of the characteristic polynomial of a matrix.
7. List out the Properties of Eigenvalues.
8. Explain various types of Quadratic Forms.

## Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Show that for any orthogonal matrix $Q$, the inverse is equal to its transpose, $Q^{-1}$=$QT$. Provide an example.
10. State and prove Cayley – Hamilton theorem.
11. Describe Cramer's rule for finding solution of system of linear equations.
12. Explain form and its properties of
    (i) Canonical method (ii) Echelon method
13. Prove that the index of a quadratic form is equal to the number of positive eigenvalues of the corresponding matrix. Use an example to illustrate your proof.

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