Roll.No. | 20USTCT2004

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 - NOVEMBER 2025
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 different types of special matrices (idempotent, nilpotent, involutory).
2. Write and explain the methods of finding the rank of a matrix.
3. Discuss the conditions for consistency of linear equations.
4. Write short notes on Eigen values and Eigen vectors with properties.
5. State and explain the properties of determinants.
6. Explain the Cayley–Hamilton theorem and its application in matrix inversion.
7. Explain the properties of quadratic forms.
8. Discuss the process of reducing quadratic forms to canonical form.

Section C

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

9. Explain the properties of matrix addition and multiplication with examples.
10. Describe in detail the properties of singular and non-singular matrices with examples.
11. Explain and compare homogeneous and non-homogeneous systems of linear equations. State the conditions for consistency.
12. Prove the Cayley–Hamilton theorem for a square matrix and illustrate how it can be used to compute higher powers of the matrix.
13. Show how a quadratic form can be reduced to its canonical form using an orthogonal transformation. Explain index and signature in this context.

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