**B.Sc. DEGREE EXAMINATION, NOVEMBER 2015.**

**I YEAR — II SEMESTER**

**MAJOR PAPER IV — MATRIX ALGEBRA**

**Time : 3 hours Max. marks : 60**

**SECTION A — (10 × 1 = 10 marks)**

**Answer any *TEN* questions.**

1. Define a matrix.
2. Find the transpose of the given matrix A = .
3. Find the rank of the matrix A where A = 
4. Define singular and Non – Singular matrix.
5. Define Null Space.
6. Show that the equations *2x+6y+11=0; 6x+20y-6z+3=0; 6y-18z+1=0* are not consistent.
7. Find the characteristics root of 
8. Define characteristic vector.
9. Define Index of a quadratic form.
10. Define quadratic form.
11. Define Hermitian Matrices.
12. Define trace of a matrix.

**SECTION B — (5 × 4 = 20 marks)**

**Answer any *FIVE* questions.**

1. If A =  B =  C = 

Evaluate 2A+3B-5C

1. Find the inverse of the matrix A = .
2. State and prove sylvester’s law of Nullity.
3. If X1 and X2 are two eigen vectors corresponding to eigen value X of a matrix A then their linear combination  where and β are non-zero scalars is also an eigen vector corresponding to the same eigen value, verify.

[P.T.O.]

1. Write down the quadratic form corresponding to the symmetric matrix .
2. Find the rank of the matrix A where A = 
3. If A =  B =  C =  find *A+B-C?*

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. Explain various types of matrices.
2. Prove that Elementary transformations of a matrix do not alter its rank.
3. State and prove condition for consistency.
4. State and prove Cayley-Hamilton theorem.
5. State and prove congruent reduction of a symmetric matrix.

**———————**