B.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

 I Year II Semester

Core Major - Paper IV - MATRIX ALGEBRA

Time : 3 Hours Max. Marks : 60

SECTION A – (10 × 1 = 10 marks)

Answer any *TEN* questions

1. What is a scalar matrix?
2. Give an example for upper triangular matrix.
3. Define adjoint of a matrix.
4. Is inverse of a matrix is unique?
5. When a given system of equations are said to be consistent?
6. What are the methods used to find the solution of a system of a non-homogeneous linear equations?
7. The rank of the transpose of a matrix is the same as that of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. If A is a Skew-Hermitian matrix, then show that iA is a Hermitian matrix.
9. Define Eigen value.
10. Find the eigen value of the matrix 4 1

 3 2

1. State Cramar’s rule.
2. Give the types of quadratic forms.

SECTION B – (5 × 4 = 20 marks)

Answer any *FIVE* questions

1. If A = 1 3 and B = -1 -2

3 2 0 5

2 5 3 1

 Find the matrix D such that A + B – D = 0

1. If A and B be matrices such that both AB and A+B are defined. Prove that both A and B are square matrices of the same order.
2. Find the inverse of A = 0 1 1
3. 2 0

3 -1 4

1. Show that the two matrices A, P-1 AP with corresponding root.
2. Examine the consistency and hence solve the equations.

 x+y+4z = 6 ; 3x+ 2y-2z = 9 and 5x+y+2z = 13

1. Prove that similar matrices have the same characteristic roots.
2. Find the characteristic roots of the matrix

 A= 1 1 3

 5 2 6

 -2 -1 -3

Also verify Cayley Hamilton theorem.

1 [P.T.O.]

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Prove that the multiplication of matrices is not always commutative.
2. Prove that the inverse of an orthogonal matrix is orthogonal.
3. Explain the method of solving the system of non-homogeneous system of equations by the method of inverse.
4. State and prove Cayley Hamilton theorem.
5. Explain the method of reduction of quadratic form to canonical form.

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