**St. Xavier’s College (Autonomous), Kolkata**

**Department of Statistics**

**Problem Set 3**

**MDSC 4113/SEM I/CORE3 DATE:**

1. For the matrix M= find the following:
2. Trace of M
3. Rank of M
4. Inverse of M
5. Determinant of M using the functions Det(A) and cofactor(A,i,j)
6. Apply Gram-Schmidt orthogonalization to the following sequence of vectors:

(1,2,0), (8,1,-6), (0,0,1)

1. Check whether the following vectors are independent:
2. (2, 3, 1), (1, 0, 4), (2, 4, 1), (0, 3, 2)
3. (1, 3, −1, 0), (2, 9, −1, 3), (4, 5, 6, 11), (1, −1, 2, 5), (3, −2, 6, 7).
4. (1, 1, 0), (3, 0, 1), (5, 2, 1)
5. (1, 4, 1, 7), (3, −5, 2, 3), (2, −1, 6, 9), (−2, 3, 1, 6).
6. Find the rank and basis of the row space, column space, null space and left null space of the following matrices:
7. A=
8. B=
9. Find the orthogonal basis for the row space of the matrix A in i.