**23MAT117-Linear Algebra**

**Assignment -1**

Total marks:10

1. Verify that the set of polynomials of the form with the operations

and is a vector space. **[CO 1]**

1. Show that the set of upper triangular matrices is a subspace of the vector space of all matrices. **[CO 1]**
2. Show that the polynomials do not span . **[CO 1]**
3. Show that the vectors form a linearly dependent set in
4. Show that the polynomials forms a basis for **[CO 1]**
5. Consider the bases and for , where Find the transition matrix from to . **[CO 1]**
6. Show that the given vectors are orthogonal to each other in with respect to standard inner product . **[CO 2]**
7. Find and relative to the inner product on and **[CO 2]**
8. Let have the Euclidean inner product. Use the Gram–Schmidt process to transform the following basis into an orthonormal basis  **[CO 2]**
9. Find the QR decomposition of **[CO 2]**
10. Find the lease square solution and least square error of **[CO 2]**
11. Find the orthogonal projection of **u** onto the plane spanned by the vectors and .

**[CO 2]**