Tutorial No.4

Q.1] Discuss linear dependence or independence of the following set of vectors

a) B=$\left\{\begin{bmatrix}1\\2\\3\end{bmatrix}, \begin{bmatrix}1\\2\\5\end{bmatrix}, \begin{bmatrix}5\\3\\4\end{bmatrix}\right\}$ of $\mathbb{R}^3$

b) B= $\{1, t, 1\text{-}2t\}$ of $P_1(t) = \{a + bt \ / a, b \ \varepsilon \mathbb{R}\}$

Q.2] Find Linear Span of the following set of Vectors

a) B=$\left\{\begin{bmatrix}2\\1\\0\end{bmatrix}, \begin{bmatrix}0\\2\\1\end{bmatrix}, \begin{bmatrix}1\\0\\4\end{bmatrix}\right\}$ of $\mathbb{R}^3$

b) B=$\{1, t, t^2\}$ of $P_2(t)=\{a + bt + ct^2 \mid a, b, c \in \mathbb{R}\}$

Q.3] Examine whether the following set of vectors is Basis and if Basis find dimensions of the Vector Space

a) B= $\left\{\begin{bmatrix}3 & 12\\12 & 4\end{bmatrix}\right\}$ of Vector Space of all 2X2 symmetric matrices

b) B=$\{t, t^2, t^3\}$ of $P_3(t)=\{a + bt + ct^2 + dt^3 \mid a, b, c, d \in \mathbb{R}\}$

Q.4] Find Basis and dimensions of the row space and column space of the matrix A

a) A=$\begin{bmatrix}3 & 2 & 3 & 4\\2 & 1 & 3 & 1\\1 & 0 & 1 & 1\\0 & 1 & 1 & 1\end{bmatrix}$

b) A=$\begin{bmatrix}5 & 2 & -1 & -2\\1 & -1 & -2 & -1\\3 & 2 & -2 & 0\end{bmatrix}$