Linear Algebra

Quiz# 5 (BSSE23-A), Fall 2024 November 01, 2024

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Maximum Time Allowed: 10 minutes

Roll Number:

BSSE23058.

Maximum Marks: 10

1. For the matrix A and vector b as shown

$$A = egin{bmatrix} 1 & 1 \ 0 & 1 \ 0 & 0 \end{bmatrix}, b = egin{bmatrix} 2 \ 3 \ 4 \end{bmatrix}$$

(a) Project b onto the column space of A by solving $A^T A \hat{\mathbf{x}} = A^T b$ and p = Ax.

(b) Find e = b - p. Show that it is perpendicular to the columns of A.

N1+ N2 2 2, M1+2N2 25.) N2-272-2-5 N2 = 3.

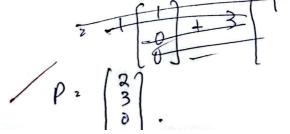
$$y_{1} + 3 = 2$$

$$y_{1} = 2^{-3}$$

$$\begin{pmatrix} 9(1) \\ \chi_2 \end{pmatrix} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$$

$$P = A \chi$$

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \\ 0 & 0 \end{bmatrix} \begin{bmatrix} -1 \\ 3 \end{bmatrix} = \begin{bmatrix} 2 \\ 3 \\ 0 \end{bmatrix}$$



-1 +3