VECTOR ASSIGNMENT

Shristy Sharma (EE22BNITS11001)

1 PROBLEM 1

1. If either vector $\mathbf{a}$=0 or $\mathbf{b}$=0, then $\mathbf{a}^\top\mathbf{b} = 0$.But the converse need not be true. Justify your answer with an example.

SOLUTION:

Let,

$$\mathbf{a} = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} \tag{1.0.1}$$

$$\mathbf{b} = \begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix} \tag{1.0.2}$$

$$\mathbf{a}^\top\mathbf{b} = \begin{pmatrix} 1 & 1 & 1 \end{pmatrix}\begin{pmatrix} 1 \\ 1 \\ -1 \end{pmatrix} \tag{1.0.3}$$

$$= \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} \tag{1.0.4}$$

Here, $\mathbf{a} \neq 0$ and $\mathbf{b} \neq 0$

Therefore, the converse need not be true.