19CS10071

Q1) Let the linear transformation be denoted by f and associated matrix be T

$$\therefore f(e_1) = \begin{pmatrix} 1 \\ 0 \\ -1 \end{pmatrix}, \quad f(e_2) = \begin{pmatrix} 2 \\ 1 \\ 0 \end{pmatrix}$$

$$f(e_3) = \begin{pmatrix} -1 \\ 1 \\ 0 \end{pmatrix}$$

$$\therefore \text{Matrix } T = \begin{bmatrix} | & | & | \\ f(e_1) & f(e_2) & f(e_3) \\ | & | & | \end{bmatrix} = \begin{bmatrix} 1 & 2 & -1 \\ 0 & 1 & 1 \\ -1 & 0 & 0 \end{bmatrix}$$

$$\text{Trace}(T) = 1 + 1 + 0 = 2 \quad (\text{Ans})$$