Which of the following is not a correct boundary condition at an interface between two homogeneous dielectric media ? (In the following $\hat{n}$ is a unit vector normal to the interface, σ and j_s are the surface charge and current densities respectively.)

$\vec{D}_{1n} - \vec{D}_{2n} = \sigma$

(A) $\hat{n} \times (D_1 - D_2) = 0$ (B) $\hat{n} \times (H_1 - H_2) = j_s$

(C) $\hat{n} \cdot (D_1 - D_2) = \sigma$ (D) $\hat{n} \cdot (B_1 - B_2) = 0$

The permittivity tensor of a uniaxial anisotropic medium, in the standard Cartesian basis, is $\begin{pmatrix} 4\varepsilon_0 & 0 & 0 \\ 0 & 4\varepsilon_0 & 0 \\ 0 & 0 & 9\varepsilon_0 \end{pmatrix}$ where ε_0 is a constant. The wave number of an electromagnetic plane wave polarized along the x-direction, and propagating along the y-direction in this medium (in terms of the wave number k_0 of the wave in vacuum) is—

(A) $4k_0$ (B) $2k_0$

(C) $9k_0$ (D) $3k_0$

$$\vec{E} = \hat{x} E_0 e^{-\kappa y \hat{y}}$$

$$\kappa = \omega\sqrt{\mu_0 \epsilon}$$

$$\epsilon = 4\epsilon_0$$

$$\kappa = \omega\sqrt{\mu_0 (4\epsilon_0)}$$

$$= 2\omega\sqrt{\mu_0 \epsilon_0}$$

$$\kappa = 2\kappa_0$$

$$\kappa_0 = \omega\sqrt{\mu_0 \epsilon_0}$$