50. (a) Eq. 22-33 leads to $\tau = pE \sin 0^\circ = 0$.

(b) With $\theta = 90^\circ$, the equation gives

$$\tau = pE = \left(2 \times 1.6 \times 10^{-19} \text{ C}\right) \left(0.78 \times 10^{-9} \text{ m}\right) \left(3.4 \times 10^6 \text{ N/C}\right) = 8.5 \times 10^{-22} \text{ N} \cdot \text{m}.$$

(c) Now the equation gives $\tau = pE \sin 180^\circ = 0$. 