Consider an N-channel MOSFET with the following parameters:

\[ V_{GS} = V_{DD} = 5 \, \text{V} \]
\[ V_T = 1 \, \text{V} \]

Electron mobility: \( \mu_n = 500 \, \text{cm}^2/\text{V-s} \)

MOSFET width: \( W = 10.0 \, \mu\text{m} \)

Channel length: \( L = 10 \, \mu\text{m} \)

1) What is the magnitude of the electric field at the beginning of the channel in V/cm. Assume the square law theory and compare you answer to the critical field for velocity saturation in silicon, \( \approx 7 \, \text{kV/cm} \).