1-2)

A) This is similar to projectile motion under a constant gravitational force; the path is parabolic. We showed this is Phys I.

B) Let the origin be the point at which the electron enters the E field. The x axis is horizontal (+ right) and the y axis is vertical (+ down in this case). The force on the electron is
$F_E = qE = m_e a_y$ towards the bottom of the page.
The acceleration in the x direction is zero (no x forces).
Kinematic equations:
$y = y_i + v_{iy}t + {}^1/_2 a_y t^2$
$x = x_i + v_{ix}t + {}^1/_2 a_x t^2$
These become
$y = {}^1/_2 a_y t^2 = {}^1/_2 (qE/m_e) t^2$
$x = v_{ox}t$
Use the latter to find the time to travel:
$t = x/v_{ox} = 0.03/2\times10^6 = 1.5\times10^{-8}$ seconds
Now substitute back into the y equation to find E:
$y = {}^1/_2 (qE/m_p)\, t^2 = {}^1/_2 (1.6\times10^{-19})(20{,}000)/(9.11\times10^{-31})\,(1.5\times10^{-8})^2 =$ 0.395 m

C) If the electron had been injected parallel to the field, its motion would be linear, or if you prefer, a very thin parabola. There would be no lateral force components to cause sideways acceleration.