Question 7. An electron (mass m) with an initial velocity $v = v_0 i (v_0 > 0)$ is in an electric field $E = E_0 \hat{i}$ (E_0 = constant > 0). Its de-Broglie wavelength at time t is given by

Solution: As F= -eEi

a = -eEi/m where m = mass of electron;

$v(t) = v_0 - eE/m$

From De Broglie hypothesis

$\lambda = h/p = h/mv = h/m(v_0 - eE/m)$