PYL 102 – Home Work 1

1. Consider a sample of n-Si at room temperature with the following condition:

   $$E_d = E_c - 50\ meV$$

   Assuming the doping concentration to be very low, calculate the ratio of ionized donor impurities to total impurities, i.e. $N_d^+ : N_d$.

   [3]

2. Suppose that an electric field is applied at 45° to the x-axis of the [100] valley in the CB of Si. Assuming that only this value contributes to the current, calculate the direction of acceleration of the electron.

   [3]