

### QM3 2020-21, Problem 3

Three identical particles of mass  $m$  are confined in a one-dimensional box of length  $L$ . The confining potential is:

$$v(x) = \begin{cases} 0 & 0 \leq x \leq L \\ \infty & \text{otherwise} \end{cases}$$

Write down the ground state wavefunction, ground state energy and explain if the ground state energy is degenerate when the particles are:

(a) spinless bosons, (b) spinless fermions, (c) electrons (ignore the Coulomb repulsion between the electrons).