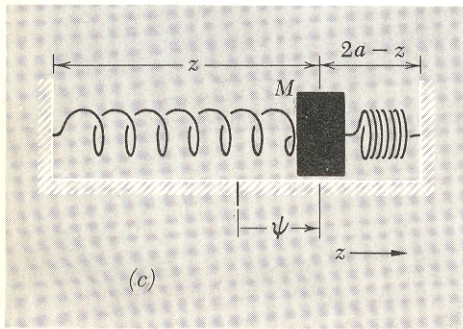
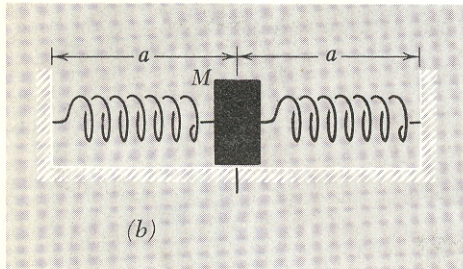
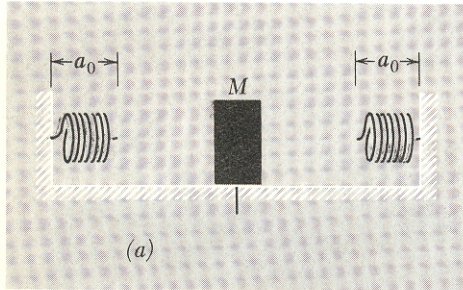


## PHYS205 Assignment 6

Due Monday 30<sup>th</sup> April 2018 5 pm to the PHYS205 assignment Dropbox 5<sup>th</sup> floor West (chem side)

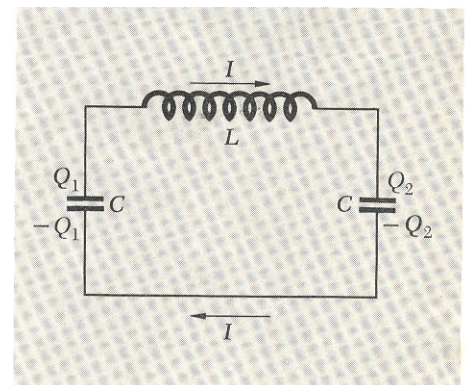


### Question 1 [10 marks]

Consider the figure opposite, having a mass  $M$  connected to rigid walls via two springs each having a spring constant  $K$  and a relaxed length  $a_0$ , as shown in (a). At equilibrium (b) each spring is stretched to a length  $a$  and therefore each spring has a tension  $K(a - a_0)$  at equilibrium. Considering (c) derive an expression for the resonance frequency of the mass-spring system. Show all of your working.

### Question 2 [10 marks]

The figure opposite shows a free oscillator composed of an LC circuit. Derive an expression for the resonance frequency. Show all of your working.



[Total Marks: 20]