Accelerated General Chemistry
Chapter 1 Quantum Number Example Problems

1. (a) How many subshells exist with a principal quantum number of $n = 4$? Label each by its value of n and the letter designation for l. (b) How many orbitals make up the $n = 4$ shell? (c) How many electrons can occupy the $n = 4$ shell?

2. Are the following combinations of quantum numbers allowed? If not, propose a change in one of the quantum numbers that would correct the problem.
   (a) $n = 2$; $l = 0$, $m_l = -1$, $m_s = -1/2$
   (b) $n = 4$; $l = 3$; $m_l = -1$, $m_s = 0$
   (c) $n = 3$; $l = 1$; $m_l = 0$, $m_s = +1/2$
   (d) $n = 5$; $l = 2$; $m_l = +3$, $m_s = +1/2$
   (e) $n = 3$; $l = 3$; $m_l = -2$, $m_s = -1/2$