

**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)  $n = 3; l = 3; m_l = -2, m_s = -1/2$