General Chemistry I
Chapter 7: Example Problems on Quantum Numbers

1. (a) How many subshells (or sublevels) 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) \( n = 2; \ l = 0, \ m_l = -1 \)
(b) \( n = 4; \ l = 3; \ m_l = -1 \)
(c) \( n = 3; \ l = 1; \ m_l = 0 \)
(d) \( n = 5; \ l = 2; \ m_l = +3 \)