In your group, discuss the following and come up with a consensus definition or description.

| Quantum Number | $n$ | $l$ | $m_l$ | $m_s$ |
|---|---|---|---|---|
| Quantum Title | | | | |
| Allowed Values | | | | |
| Definition & physical description | | | | |

| $n$ | $l$ | $m_l$ | Subshell Designation |
|---|---|---|---|
| 1 | | | |
| | 0 | | |
| | | -1, 0, 1 | |
| | | | 3s |
| 3 | | | |
| 3 | 2 | -2, -1, 0, 1, 2 | 3d |

1. Which best describe the shape of a s orbital.
    A) three lobes   B) a sphere      C) two lobes      D) eight lobes    E) four lobes

2.  Describe the shape of a p orbital.
    A) four lobes     B) a sphere      C) two lobes      D) three lobes   E) eight lobes

3. Describe the shape of a d orbital.
    A) a sphere       B) four lobes     C) three lobes   D) two lobes      E) eight lobes

4.  In your group, decide which of the following best describes an atomic orbital:
       A) a fixed path that an electron follows around the nucleus of an atom
       B) the region of electron density for a covalent bond
       C) the repulsion of all the electrons among themselves
       D) the shape of an atom
       E) the region of high probability for an electron around the nucleus of an atom

5.  Define what is meant by a "node" with regards to an atomic orbital.

6.  How many different values of $l$ are possible in the third principal level?
       A) 2       B) 3       C) 1       D) 0       E) 4

7.  Which one of the following set of quantum numbers would not be allowed? Explain why.
       A) $n = 3, l = 2, m_l = -1$
       B) $n = 3, l = 2, m_l = 1$
       C) $n = 3, l = 1, m_l = -1$
       D) $n = 3, l = 0, m_l = 0$
       E) $n = 3, l = 3, m_l = 1$

8.  Identify the correct values for a 2p sublevel.
       A) $n = 2, l = 1, m_l = 0$
       B) $n = 3, l = 1, m_l = 0$
       C) $n = 2, l = 1, m_l = -2$
       D) $n = 1, l = 0, m_l = 0$
       E) $n = 4, l = -1, m_l = -2$

9.  Which of the following subshells is correctly designated?
       A) 3s3            B) 2p6            C) 4d11            D) 3f2            E) 1p5

10.  Which set of numbers are allowed for $m_l$ for a d orbital.
       A) -2, -1, 0, 1, 2            B) 0, 1, 2, 3, 4            C) 1, 2, 3, 4, 5            D) 1, 2, 3

11.  Each of the following sets of quantum numbers is supposed to specify an orbital.  Which of the following
     sets of quantum numbers contains an error?
       A) $n = 3, l = 3, m_l = -2$
       B) $n = 1, l = 0, m_l = 0$
       C) $n = 3, l = 0, m_l = 0$
       D) $n = 2, l = 1, m_l = -1$
       E) $n = 4, l = 2, m_l = 0$