Q# #1-10 pg. 179

1. $n = 3$

$l = 0, \ldots n-1$

$= 0, 1, 2$

For $l = 0$

$m_l = 0$

For $l = 1$

$m_l = -1, 0, 1$ OR $m_l = 0, \pm 1$

For $l = 2$

$m_l = -2, -1, 0, 1, 2$

$n^2 = 3^2$

$= 9$

2. $n = 5$ $l = 2$

5d

For $l = 2$

$m_l = -2, -1, 0, 1, 2$

5 orbitals

3. a) 2s $n = 2$ $l = 0$

For $l = 0$

$m_l = 0$

b) 3p $n = 3$ $l = 1$

For $l = 1$

$m_l = -1, 0, 1$

c) 5d $n = 5$ $l = 2$

For $l = 2$

$m_l = -2, -1, 0, 1, 2$

d) 4f $n = 4$ $l = 3$ $m_l = -3, -2, 0, 1, 2, 3$

4. a) $n = 2$ $l = 0$ $m_l = 0$

2s

b) $n = 5$ $l = 3$ $m_l = -2$

5f

5. a) 1s $n = 1$ $l = 0$

$m_l = 0$

$\therefore$ 1 orbital

b) 5f $n = 5$ $l = 3$

$m_l = -3, -2, -1, 0, 1, 2, 3$

$\therefore$ 7 orbitals

c) 4f $n = 4$ $l = 3$

$m_l = -3, -2, -1, 0, 1, 2, 3$

$\therefore$ 7 orbitals

d 2p $n = 2$ $l = 1$

$m_l = -1, 0, 1$

$\therefore$ 3 orbitals

6. 4d $n = 4$ $l = 2$

$m_l = -2, -1, 0, 1, 2$

7. a) $n = 3$ $l = 1$ $m_l =$ ___

$m_l = -1, 0, 1$

b) $n = 4$ $l =$ ___ $m_l = -3$

$l = 0, 1, 2, 3$

8. 6p $n = 6$ $l = 1$

$m_l = -1, 0, 1$

9. a) $\boxed{n=1}$ $l=2$ $m_l=-2$

$n=3$

b) $n=4$ $l=1$ $\boxed{m_l=-2}$

$m_l=-1, 0, 1$

10. a) $n=3$ $l=2$ $m_l=0$ ✓

b) $n=1$ $\boxed{l=1}$ $m_l=-1$

X

c) $\boxed{n=0}$ $l=0$ $m_l=0$

X

d) $n=5$ $l=1$ $\boxed{m_l=3}$ X

$m_l=-1, 0, 1$