ANSWERS TO ELECTRONIC CONFIGURATION PROBLEM SET

1. $n = 1$ $l = 0$ $m_l = 0$ $s = +\frac{1}{2}$ $n = 1$ $l = 0$ $m_l = 0$ $s = -\frac{1}{2}$
    $n = 2$ $l = 0$ $m_l = 0$ $s = +\frac{1}{2}$ $n = 2$ $l = 0$ $m_l = 0$ $s = -\frac{1}{2}$
    $n = 2$ $l = 1$ $m_l = +1$ $s = +\frac{1}{2}$ $n = 2$ $l = 1$ $m_l = +1$ $s = -\frac{1}{2}$
    $n = 2$ $l = 1$ $m_l = 0$ $s = +\frac{1}{2}$ $n = 2$ $l = 1$ $m_l = 0$ $s = -\frac{1}{2}$
    $n = 2$ $l = 1$ $m_l = -1$ $s = +\frac{1}{2}$ $n = 2$ $l = 1$ $m_l = -1$ $s = -\frac{1}{2}$
    $n = 3$ $l = 0$ $m_l = 0$ $s = +\frac{1}{2}$ $n = 3$ $l = 0$ $m_l = 0$ $s = -\frac{1}{2}$
    $n = 3$ $l = 1$ $m_l = 1$ or 0 or -1 $s = +\frac{1}{2}$ or $-\frac{1}{2}$

2. $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$ $(3d^2 3d^1 3d^1 3d^1 3d^1)$

3. (a) V   (b) As   (c) Xe   (d) Pr   (e) Sr

4. (a) $[Kr]4d^{10}5s^2$ (b) $[Kr]4d^{10}5s^2 5p^1 5p^1$
    (c) $[Ar]3d^{10}4s^1$ (d) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10}4s^2 4p^6$

5. (a) 0   (b) 2   (c) 1   (d) 0

6. (a) [Ar]   (b) $[Ar]3d^5$ (c) [Ar]   (d) $[Ar]3d^5$

7. (a) Diamagnetic   (b) Paramagnetic   (c) Diamagnetic   (d) Paramagnetic

8. Atomic number 118

9. (a) Representative element   (b) Transition element
    (c) Representative element   (d) Inner transition element
    (e) Noble gas

10. (a) Ground state of Ne   (b) Excited state of Be
    (c) Excited state of N   (d) Excited state of Be

11. (a) Not possible $(n \neq l)$
    (b) Not possible $(n \neq l)$
    (c) Not possible (if $l = 0$, $m \neq 2$)
    (d) Can occur
    (e) Not possible $(s \neq +1)$

12. (a) Ground state of Be
    (b) Excited state of B
    (c) Impossible; cannot have 8 electrons in $3p$ orbitals
    (d) Impossible; cannot have $2d$ orbitals
    (e) Ground state of V
    (f) Excited state of Ar