CHEM 1101 A
MID-TERM TEST #1 FALL 2016 – 75 MINUTES

- Print your name and student number on your test booklet. UNDERLINE YOUR LAST NAME
- SPACE OUT YOUR ANSWERS – we will mark answers on the lined side of the page only – you can use the other side for rough work if you wish
- **KEEP YOUR TEST PAPER - HAND IN ONLY THE BOOKLET**
- **TURN OFF YOUR CELL PHONES AND ANY ALARMS YOU MAY HAVE**

20% 1. Tin has an ionization energy of 705 kJ/mol. Determine the maximum wavelength of the electromagnetic radiation that will trigger the photoelectric effect in tin, in nanometers:

20% 2. For indium $_{49}$In:

a) Give the electron configuration

b) Identify the valence subshell(s). Give the orbital diagram and the quantum numbers for all electrons in the valence subshell(s)

c) Identify the highest energy subshell. Give the orbital diagram and the quantum numbers for all electrons in the highest energy subshell, if different from b).

d) Give the electron configuration for the Indium ion, In^{3+}.

20% 3. For the following elements: Al, Ar, K, Mg, Ne, P, Si

a) Rank in order of **increasing** size

b) Rank in order of **increasing** ionization energy

20% 4. Give the IUPAC (systematic) name for the following:

a) Sb_2O_3 b) In_2O_3 c) $CrPO_4$ d) N_2O_5

Give the chemical formula for the following:

e) Lead sulfate f) gallium (I) sulfide g) ammonium nitrate

20% 5. For iodine trichloride, ICl_3

a) Show the Lewis diagram

b) Give the bond order for each bond

c) Draw and name the VSEPR geometry