

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 ${}_{49}\text{In}$:

- 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+} .

l: 0 1 2 3
 s p d f

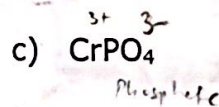
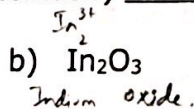
20% 3. For the following elements: Al, Ar, K, Mg, Ne, P, Si

- a) Rank in order of **increasing** size
- b) Rank in order of **increasing** ionization energy

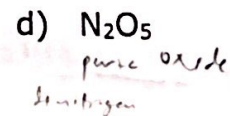
Atomic size → ↑ size ↓ charge

ionization ↓ ←

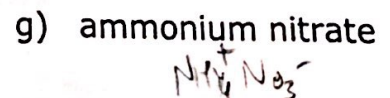
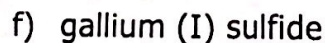
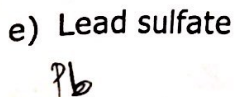
20% 4. Give the IUPAC (systematic) name for the following:



Chromium(III) Phosphate



Give the chemical formula for the following:



20% 5. For iodine trichloride, ICl_3

$7 + 3(7) = 28.$

- a) Show the Lewis diagram
- b) Give the bond order for each bond
- c) Draw and name the VSEPR geometry