This quiz is take-home and open book, and it is intended that all members of the group contribute to completing it. It is a violation of the Academic Honor Code to sign a quiz that you did not work on. **The quiz is due at the end of class on Thursday, January 28.** 

## List names in alphabetical order, and give social security numbers! Put names on all pages, and stapel pages together

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Points

- (2) 1. Give the proper structural formulas for the following ionic compounds:
  - (a) sodium sulfide (b) magnesium oxide
  - (c) potassium selenide (d) calcium fluoride

(3) 2. Draw Lewis dot structures for the following molecular compounds

(a)  $NCl_3$  (N is central atom) (b)  $CS_2$  (C is central atom)

(c) HOCl (O is central atom) (d) Chloroform (CHCl<sub>3</sub>, C is central atom)

(e) Formaldehyde (CH<sub>2</sub>O, C is central)

(e) Hydrogen cyanide (HCN, C is central)

(2)	3.	The following molecular compounds have more than one proper Lewis structure.	Draw
		at least two <b>resonance forms</b> for each compound.	

(a)  $SO_3$  (S is central)

(b) Laughing gas (NNO, connected in that order.)

4. Nitric oxide (NO) is one of the pollutants produced by automobile engines that ultimately leads to production of other nitrogen oxides, ozone, and smog in the atmosphere. Strangely enough, it has also been in the news lately as a relatively recently discovered important molecule in biological signaling processes. For example, it is produced from nitroglycerine and relaxes blood vessels. It is also implicated in the action of Viagra. (Viagra blocks breakdown of a compound that was produced by NO stimulation.) As a small, gaseous molecule, NO easily diffuses from one tissue to another. However another chemical property causes it to be unstable and relatively short-lived, a good property for an signal intermediate. Draw two Lewis dot resonance structures for NO. What rule must you violate? How does this violation account for the chemical properties of NO?

(3) 5. Calculate the wavelength (8) of the electromagnetic radiation carrying the signal for WTNT (94.9 MHz).

(3) 6. Calculate the energy of a photon of the radiation in question 5.