Trent Archie
UAB CH 235 SI

Session 1

Part 1

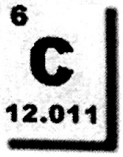
Please define the following terms. You may use your book, notes, or neighbor.

1. Organic Chemistry: Study of organic compounds.
2. Aufbau ("Build-Up") Principle: orbitals fill from lowest to highest energy.
3. Pauli Exclusion Principle: no more than 2e⁻ in an orbital and their spins should be opposite.
4. Hund's Rule: When orbitals of equal energy are available but there are not enough electrons to fill them all, one electron is placed in each orbital before placing two electrons in one orbital
5. Cation: Atom that loses an electron
6. Covalent bond: sharing of electrons between two atoms in a bond.
7. Lone-pair electrons: Valence electrons not used in bonding

Part 2

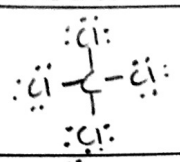
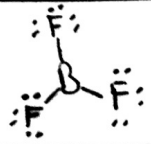
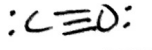
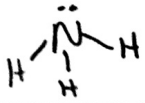
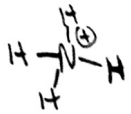
Review parts of an atom, specifically **carbon**.

1. Carbon has 6 neutrons.
2. Carbon has 6 protons, which represents the atomic number of an atom.
3. Carbon has an atomic mass of 12, composed of protons and neutrons.
4. Carbon has 6 electrons.
5. The outer shell orbital holds 4 valence electrons.



Part 3

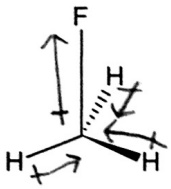
Part 6:
Draw the Lewis Dot Structure for each species and indicate its molecular geometry.

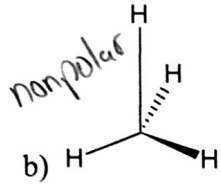
Species	Lewis Dot Structure	Molecular Geometry
CCl_4		tetrahedral
BF_3		trigonal pyramidal
CO		linear
NH_3		trigonal planar
NH_4^+		tetrahedral

Part 7: Dipole Moments

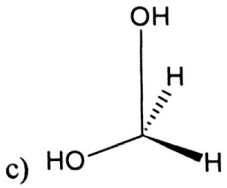
Which of the following molecules are polar? If polar, indicate the direction of the dipole moments **and** the net dipole moment.

polar 

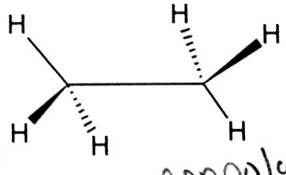
a) 



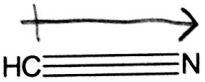
b)



c)

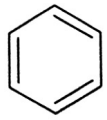
b) d) 

nonpolar

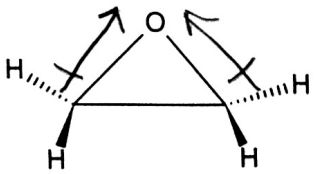


e) HC≡≡≡N

polar

f) 

nonpolar

g) 

Carbon (6 e⁻)	Oxygen (8 e⁻)	Neon
2p ↑ ↑ ___	2p ↑↓ ↑ ↑	2p ↑↓ ↑↓ ↑↓
2s ↑↓	2s ↑↓	2s ↑↓
1s ↑↓	1s ↑↓	1s ↑↓

Part 4
Use the example given below to help you identify the **electron configuration** of each atom.

$_6C = 1s^2 2s^2 2p^2$

$_1H =$ $1s^1$	$_2He =$ $1s^2$	$_8O =$ $1s^2 2s^2 2p^4$	$_{19}K =$ $1s^1 2s^2 2p^6 3s^2 3p^6 4s^1$

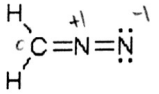
Abbreviate the following electron configurations

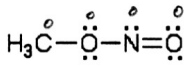
$_6C =$ [He] $2s^2 2p^2$ (Abbreviated)

$_8O =$ [He] $2s^2 2p^4$	$_{19}K =$ [Ar] $4s^1$
$_{17}Cl =$ [Ne] $3s^2 3p^5$	$_{11}Na =$ [Ne] $3s^1$

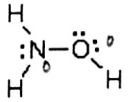
SESSION 2

Part 5: Formal Charge
Calculate the formal charge for all **non-hydrogen** atoms.

a) 

b) 

c) 



d)