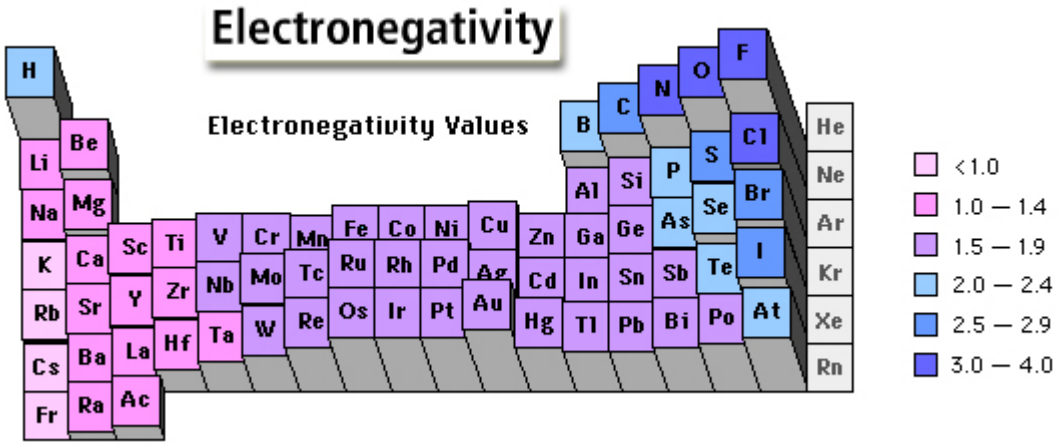
The Periodic Table

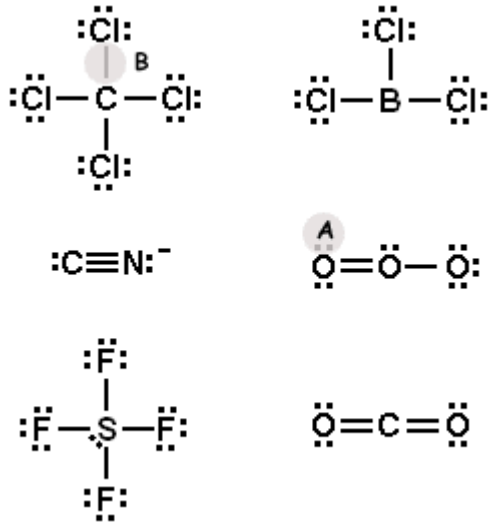
IA																	VIIIA
H 1 1.01	IIA											IIIA	IVA	VA	VIA	VIIA	He 2 4.00
Li 3 6.94	Be 4 9.01											B 5 10.81	C 6 12.01	N 7 14.01	O 8 16.00	F 9 19.00	Ne 10 20.18
Na 11 22.99	Mg 12 24.31	IIIB	IVB	VB	VIB	VIIB	VIIIB	VIIIB	VIIIB	IB	IIB	Al 13 26.98	Si 14 28.09	P 15 30.97	S 16 32.07	Cl 17 35.45	Ar 18 39.95
K 19 39.10	Ca 20 40.08	Sc 21 44.96	Ti 22 47.88	V 23 50.94	Cr 24 52.00	Mn 25 54.94	Fe 26 55.85	Co 27 58.93	Ni 28 58.69	Cu 29 63.55	Zn 30 65.39	Ga 31 69.72	Ge 32 72.61	As 33 74.92	Se 34 78.96	Br 35 79.90	Kr 36 83.80
Rb 37 85.47	Sr 38 87.62	Y 39 88.91	Zr 40 91.22	Nb 41 92.91	Mo 42 95.94	Tc 43 (97.9)	Ru 44 101.07	Rh 45 102.91	Pd 46 106.42	Ag 47 107.87	Cd 48 112.41	In 49 114.82	Sn 50 118.71	Sb 51 121.76	Te 52 127.60	I 53 126.90	Xe 54 131.29
Cs 55 132.91	Ba 56 137.33	La 57 138.91	Hf 72 178.49	Ta 73 180.95	W 74 183.85	Re 75 186.21	Os 76 190.2	Ir 77 192.22	Pt 78 195.08	Au 79 197.97	Hg 80 200.59	Tl 81 204.38	Pb 82 207.2	Bi 83 208.98	Po 84 (209)	At 85 (210)	Rn 86 (222)
Fr 87 223.02	Ra 88 226.03	Ac 89 227.03	Rf 104 (261)	Db 105 (262)	Sg 106 263)	Bh 107 (262)	Hs 108 (265)	Mt 109 (266)	Ds 110 (271)	Rg 111 (272)	Uub 112 (285)	Uut 113 (284)	Uuq 114 (289)	Uup 115 (288)			

Ce 58 140.12	Pr 59 140.91	Nd 60 144.24	Pm 61 (145)	Sm 62 150.36	Eu 63 152.97	Gd 64 157.25	Tb 65 158.93	Dy 66 162.50	Ho 67 164.93	Er 68 167.26	Tm 69 168.93	Yb 70 173.04	Lu 71 174.97
Th 90 232.04	Pa 91 231.04	U 92 238.03	Np 93 237.05	Pu 94 (240)	Am 95 243.06	Cm 96 (247)	Bk 97 (248)	Cf 98 (251)	Es 99 252.08	Fm 100 257.10	Md 101 (257)	No 102 259.10	Lr 103 262.11



SID | | | | | | | | | Last _____ First _____

Question 1
10 Points



1. The **letter** that corresponds to a pair of valence electrons **shared** by **two atoms**. _____
2. The **letter** that corresponds to a pair of valence electrons **held** by a **single atom**. _____
3. How many of these molecules **obey** the **octet rule?** _____
4. **Circle** the structure(s) that contain a **triple bond**.
5. How **many** of these molecules have **resonance** structures? _____

Question 2
12 Points

Draw the best **Lewis Dot Structure** for the following molecules

PH_3	**SF_2**
HCN	**ClO_3^-**

Question 3
10 Points

Draw the Lewis Dot Structure for **CH_3COOH** in the space provided on the left. Then answer the questions of the right.

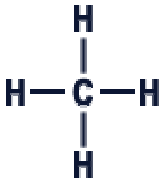
1. The **number** of **C-H** bonds: _____
2. The **number** of **O-H** bonds: _____
3. The **number** of **C-C** bonds: _____
4. The **number** of **C-O** bonds: _____
5. **Total** number of **unshared pairs**: _____

Question 4 Draw **all resonance** structures for **NO_2F**?
6 Points

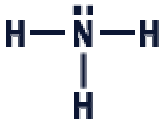
Question 5
10 Points

1. **Name** the compound with the formula **BCl_3**? _____
2. **Name** the compound with the formula **SF_6**? _____
3. **Name** the compound with the formula **SO_2**? _____
4. The **formula** for **dioxygen difluoride**? _____
5. The **formula** for **phosphorus pentachloride**? _____

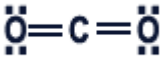
Question 6
22 Points



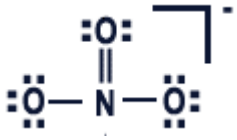
A



B

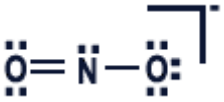


C



D

E



F

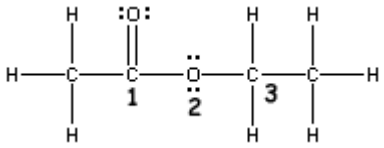
1. The **molecular geometry** for **B** is: _____
2. The **molecular geometry** for **F** is: _____
3. The **molecule(s)** with a bond angle of **~ 109^0** _____
4. The **molecule(s)** with a bond angle of **~ 180^0** _____
5. The **molecule(s)** with **trigonal planar** molecular geometry: _____
6. The **molecule(s)** with an **angular/bent** molecular geometry: _____
7. The molecule in **6**. that has the **largest** bond **angle**: _____

Question 7 Classify **each** of the **molecules** in **Question 6** as wither **Polar** (**P**) or **Non Polar** (**NP**)?
6 Points

A. _____ B. _____ C. _____

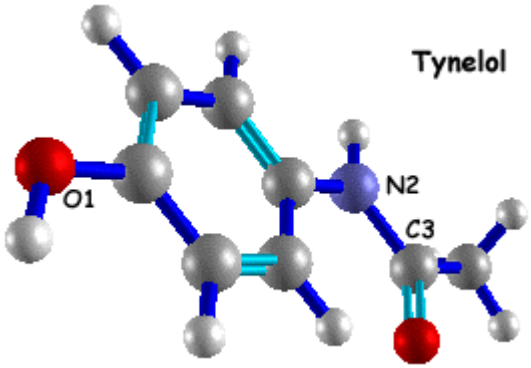
D. _____ E. _____ F. _____

Question 8
6 Points



1. The **predicted** bond angle about **1** is: _____
2. The **predicted** bond angle about **2** is: _____
3. The **predicted** bond angle about **3** is: _____

Question 9
6 Points



What is the **predicted** bond **angle** about the atoms indicated on Tylenol:

1. **Oxygen 1**: _____
2. **Nitrogen 2**: _____
3. **Carbon** 3: _____

Question 10
6 Points

Write the **equilibrium expressions** for the following reactions:

1. $2\ NO(g) + Cl_2(g) \Leftrightarrow 2\ NOCl(g)$ K = _____
2. $2\ H_2S(s) \Leftrightarrow 2\ H_2(g) + S_2(g)$ K = _____
3. $F^- + H_2O(l) \Leftrightarrow HF(aq) + OH^-$ K = _____

Question 11
6 Points

For the following equilibria, indicate using the appropriate letter whether:

A. Appreciable quantities of all species are present at equilibrium.
B. The forward reaction is favored at equilibrium.
C. The reverse reaction is favored at equilibrium.

1. $HF(aq) + H_2O(l) \Leftrightarrow H_3O^+ + F^-$ $K = 7.55 \times 10^{-4}$ @ 25^0C _____
2. $N_2(g) + 3\ H_2(g) \Leftrightarrow 2\ NH_3(g)$ $K = 3.5 \times 10^8$ @ 25^0C _____
3. $Hb + O_2(g) \Leftrightarrow HbO_2$ $K \sim 75$ @ 25^0C _____

Exam II Score