This print-out should have 16 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

001 10.0 points

Based only on the difference in electronegativity (ΔEN) identify the types of the labeled bonds in the molecule below, from left to right:



1. ionic, non-polar covalent, ionic

2. polar covalent, non-polar covalent, non-polar covalent

3. polar covalent, non-polar covalent, polar covalent

4. ionic, polar covalent, polar covalent

5. non-polar covalent, non-polar covalent, polar covalent



1. III only	y
2. II only	
3. II, III	
4. I, II, II	Ι
5. I, III	
6. I only	
7. I, II	

003 10.0 points

Which of the following is the correct Lewis structure for ethene (C_2H_4) ?



004 10.0 points

Rank the labeled bonds in the molecule below from least to most polar.



005 10.0 points

Rank the following by the polarity of their **bonds**, from most polar to least: $LiH, NH_3, BH_3, HF.$

- 1. $NH_3 > HF > BH_3 > LiH$
- **2.** $HF > LiH > NH_3 > BH_3$

3. $NH_3 > BH_3 > HF > LiH$

- 4. $BH_3 > HF > LiH > NH_3$
- **5.** $LiH > NH_3 > BH_3 > HF$

006 10.0 points

In which of the following do the unbonded electron pairs **not** distort the bond angles?

1. H₂O

2. I_3^-

3. SF₄

4. NH₃

5. O₃

007 10.0 points

Which of the following is most likely to form multiple (double or triple) bonds?

10.0 points 008

Which would have the largest dipole moment?

1. CCl₄

2. CO₂

3. NH⁺₄

4. NF₃

10.0 points 009 The molecular geometry about the carbon atoms in C_2H_6 is

- 1. tetrahedral.
- **2.** linear.
- **3.** octahedral.
- 4. trigonal bipyramidal.

5. trigonal planar.

010 10.0 points

Which of the following ions has a tetrahedral molecular geometry?

1. CO_3^{2-} **2.** H_2F^+ **3.** NH⁺₄ 4. H_3O^+ 5. NO_3^-

Which	011	10.0	points	correlant	2. BrF_3
which bonds?	substance	nas	nonpolar	covalent	3. BCl_3
1. Na(Cl				4. NO_3^-
2. CO					5. ICl_4^+

3. O₂

4. NO₂

012 10.0 points

Which of these is NOT an ionic compound?

1. NH_4I

2. $MgCl_2$

3. K₂CO₃

4. NaSCN

5. HCl

013 10.0 points

 CHF_3 is (less,more) polar than CHI_3 be

1. more; the C-F bonds are more pola the C-I bonds.

2. less; the C-H bond in CHF_3 is a non bond.

3. more; the C-H bond in CHF_3 is a nonpolar bond.

4. less; the three polar C-F bonds are symmetrical and cancel the dipole moments.

5. less; the tetrahedral geometry decreases the polarity of C-F bonds.

014 10.0 points

Which of the following only has bond angles of 90° and 180° ?

ecause	4. 14; 0
r than	5. 6; 4
-polar	016 Determine the o

1. 10; 6

2. 12; 0

3. 10; 4

e electronegativity difference, the probable bond type, and the more electronegative atom with respect to bonds formed between between the pair of atoms H and F.

10.0 points

1. 3.1; polar covalent; H

 $\mathbf{015}$

following organic molecule?

10.0 points How many σ (sigma) and how many π (pi)

bonds are there in the Lewis structure of the

 $H - C \equiv C - C - C$ $H - C \equiv C - C - C$ $H - C \equiv C - C - C$

2. 6.1; ionic; H

3. 3.1; ionic; H

4. 3.1; ionic; F

5. 6.1; ionic; F

6. 1.9; polar covalent; F

	 _

1. IF₅

- **7.** 1.9; ionic; F
- 8.1.9; ionic; H
- **9.** 1.9; polar covalent; H
- **10.** 3.1; polar covalent; F