

## HW07 - Bonding

1 1 point

Which is the correct order of increasing bond strength?

- triple, double, single
- single, double triple
- double, triple, single
- double, single, triple

2 1 point

Which do you predict to have the strongest C-N bond?

- All are equal.
- $\text{NH}_2\text{CH}_3$
- $\text{NHCH}_2$
- $\text{HCN}$

3 1 point

What total number of valence electrons should appear in the dot formula for the chlorate ion  $\text{ClO}_3^-$ ?

- 30
- 26
- 24
- 28

4 1 point

What is the bond order of the O-O bond in  $\text{O}_2$ ?

- 3
- 2
- 1
- 0

5 1 point

How many lone pairs of electrons are on nitrogen in  $\text{NF}_3$ ?

- three
- one
- two
- zero

6 1 point

How many unshared electrons and bonding electrons exist around the central atom in ozone ( $\text{O}_3$ )?

- four, four
- two, six
- zero, eight
- six, two

7 1 point

What is the bond order of the C-C bond in acetylene (ethyne,  $\text{C}_2\text{H}_2$ )?

- 1
- 2
- 3
- 1.5

8 1 point

How many total bonds and lone pairs exist in the Lewis structure for chlorine fluoride ( $\text{ClF}$ )?

- 3, 2
- 1, 4
- 2, 4
- 1, 6

9 1 point

Which of the following compounds contains exactly one unshared pair of valence electrons?

- $\text{H}_2\text{S}$
- $\text{SiH}_4$
- $\text{PH}_3$
- $\text{C}_2\text{H}_4$

10 1 point

How many total bonds and lone pairs exist in the Lewis structure for boron trichloride ( $\text{BCl}_3$ )?

- 3, 10
- 4, 7
- 3, 9
- 4, 8

11 1 point

The carbonate ion ( $\text{CO}_3^{2-}$ ) has how many resonance configurations?

- 3
- 4
- The carbonate ion does not exhibit resonance.
- 2

12 1 point

Resonance is a concept that describes the bonding in molecules...

- by asserting that electrons in a double bond can delocalize (spill over) onto adjacent single bonds to make a bond and a half.
- by asserting that double or triple bonds 'flip' or resonate between two locations in the molecule.
- where there is more than one choice of location for a double or triple bond as deduced from Lewis dot structures. The true bonding is the average over all possible multiple bond locations.

13 1 point

How many resonance structures can be drawn for  $\text{N}_2\text{O}$ ? Disregard any structure with formal charges other than 0, +1, and -1.

- 0
- 2
- 1
- 3

14 1 point

How many double bonds are present in the 'best' resonance structure of the phosphate ion?

- 3
- 2
- 1
- 0

15 1 point

Calculate the formal charge on N in the molecule  $\text{NH}_3$ .

- 0
- 2
- 1
- 3

