Name: _____ Date: _____ Pd: _____

## Chp 2 Test: Resonance (O-Chem)

1. What are resonance structures? (Short answer)

Type answer here

2. What are the "two commandments" you should not break when drawing arrows for resonance structures?

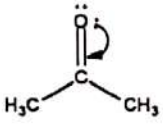
1. Type answer here

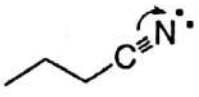
2. Type answer here

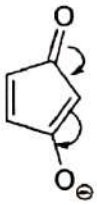
3. State which of the "two commandments" each arrow is violating. If the arrow is correct and does not violate a commandment, write "C" for correct. (You can just write 1 and 2 that correlate to your answers from question 2. Warning: some, but not all lone pairs are shown! )

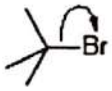
a.  = answer

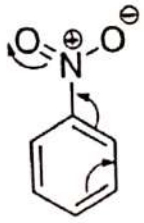
b.  = answer

c.  = answer

d.  = answer

e.  = answer

f.  = answer

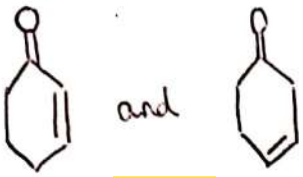
g.  = answer

**Use the "arrow/select" tool to drag the circle over the answer**

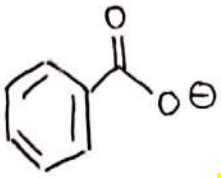
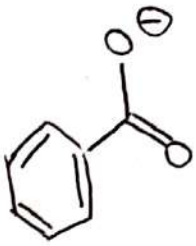
4. True or False You **CANNOT** move atoms when you draw resonance structures. (Circle answer)

5. True or False You **ARE** moving electrons when you draw resonance structures. (Circle answer)

6. Determine if the following structures are resonance structures of each other or different compounds. Label the line below each pair as "R" for resonance or "NR" for not resonance. *(Hint: it may help to draw in hydrogens that are not shown!)*

a.  and 

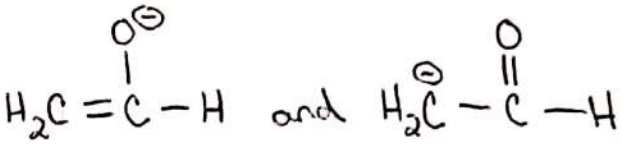
answer _____

b.  and 

answer _____

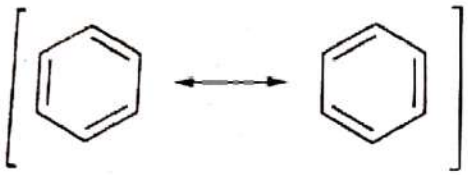
c.  and 

answer _____

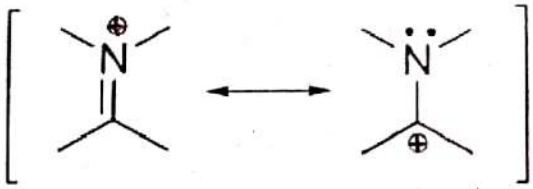
d.  and 

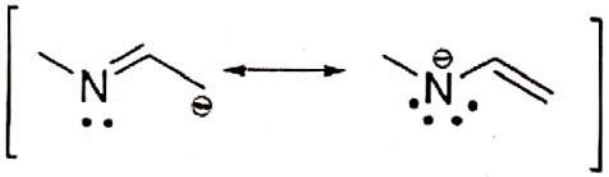
answer _____

7. Draw in the appropriate curved arrow(s) that take you from one resonance structure to the next.

a. 

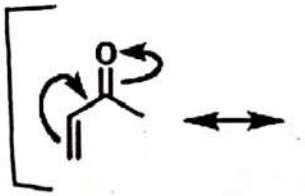
**Use the drawing tool in a color other than black to draw in the arrows.**

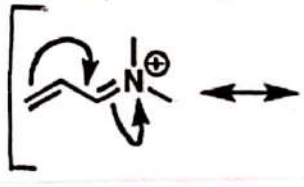
b. 

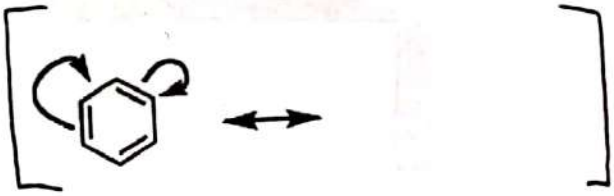
c. 

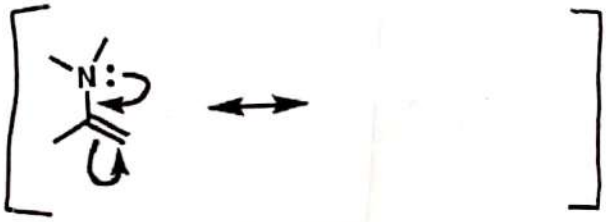
**Use the drawing tool to complete or draw your answers on a sheet of paper with #'s and send a picture.**

8. "Follow" the arrows to draw the resulting resonance structure. You MUST include formal charges, if present. Lone pairs are OPTIONAL, but strongly encouraged.

a. 

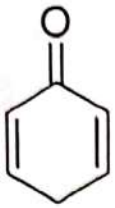
b. 

c. 

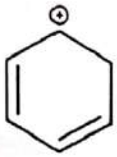
d. 

**Use the drawing tool to complete or draw your answers on a sheet of paper with #'s and send a picture.**

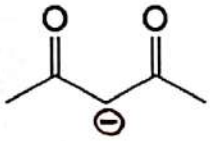
9. Draw the additional number of valid resonance structures required. You MUST include proper curved arrows and formal charges. Again, lone pairs are optional and strongly encouraged. **Circle your highest contributing resonance structure. If two are tied, then circle both.**



a. 3 more



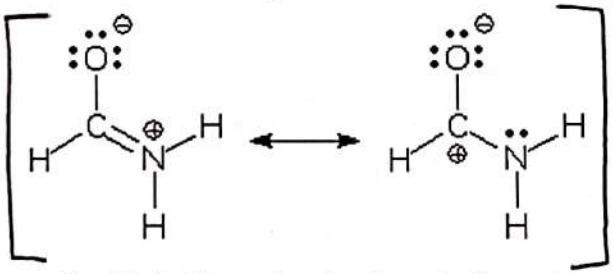
b. 2 more



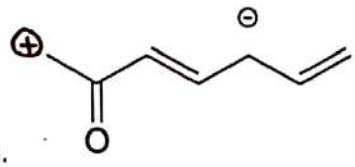
c. 3 more

## BONUS:

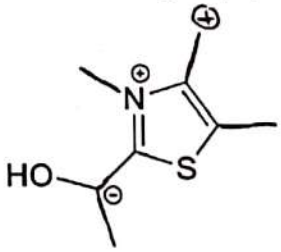
1. Circle the major resonance contributor (1pt). EXPLAIN WHY that structure more important. (1pt)



2. Write the molecular formula for each molecule. Watch those charges! (1 pt each)



a. _____



b. _____