1. Which of the following is the most acidic?

A) O
B) H2C=CH2
C) OOCCH3
D) H2O
E) CH3NH3+

2. Which of the following anions is most stable?

A) O
B) NO3-
C) HCO2-
D) CH3O-
E) H2C=CH2

3. Choose the order that has the following compounds correctly arranged with respect to increasing acidity.

1) C6H11OH
2) C6H5CO2H
3) C6H5OH

A) 2, 3, 1
B) 1, 3, 2
C) 2, 1, 3
D) 1, 2, 3
E) 3, 2, 1
4. Choose the order that has the following compounds correctly arranged with respect to increasing acidity.

5. Choose the order that has the following compounds correctly arranged with respect to increasing acidity.
6. Choose the answer that has correctly used the curved arrow formalism to show the bond making and bond breaking in the following transformation.

7. Use the following structure to answer questions 7 & 8.

Select the approximate $pK_a$ value of the hydrogen labeled E.

a. -3.8
b. 4.8
c. 9.9
d. 16.5
e. 19.5
8. Arrange the labeled hydrogens in order of increasing acidity. Submit the answer as five capital letters without spaces. For example, ABCDE would be an answer where E is the most acidic and A the least acidic.

9. Determine and draw the major product of the following acid-base reaction. HINT: use resonance theory to help you determine the most basic nitrogen.

\[
\text{H} \quad \text{N} \quad \text{H} \quad \text{H} \quad [C_7H_{13}N_2] \quad \text{H}
\]

10. Determine the major product of the following acid-base reaction.

\[
\text{H} \quad \text{H} \quad \text{NaH} \quad \text{D}_2\text{O} \quad ?
\]

\[
\text{H} \quad \text{H} \quad \text{D} \quad \text{D} \quad \text{D} \quad \text{D} \quad \text{D} \quad \text{D}
\]

A  B  C

D  E