Question 1

MC20a

Which of the following is the strongest Bronsted Acid? R-CO₂H is a carboxylic acid and R-SO₃H is a sulfonic acid, you will want to draw these two as Lewis structures and also draw the conjugate base anions to answer this question.

\[
\begin{align*}
\text{A} & \quad \text{H}_3C-CO_2H \\
\text{B} & \quad \text{H}_3C-SO_3H \\
\text{C} & \quad \text{H}_3C-CO_2H \\
\text{D} & \quad \text{H}_3C-SO_3H
\end{align*}
\]

Question 2

MC20c

Which of the following statements about the equilibrium below is true?

\[
\text{Acetone} \quad \text{Propene} \\
pK_a = 19 \quad pK_a = 43
\]

I the equilibrium will lie on the left
II the equilibrium will lie on the right
III the allyl anion is the strongest base in the equilibrium
IV propene is the weakest acid in the equilibrium

A I and IV only
B II and IV only
C II, III and IV only
D I, III and IV only

Question 3

MC20d

Which of the following is the product of the acid/base reaction between aluminum trichloride (AlCl₃) and acetone (CH₃COCH₃)?

\[
\begin{align*}
\text{A} & \quad \text{AlCl}_3 \\
\text{B} & \quad \text{AlCl}_3 \\
\text{C} & \quad \text{AlCl}_3 \\
\text{D} & \quad \text{AlCl}_3
\end{align*}
\]
Question 4

MC20e

Give the major product of the following Lewis Acid/Base reaction. Note that the non-bonding electrons are NOT shown on the fluorines in either the reactants or products (hint, you will need to draw a minor resonance contributor of the ester to determine the most reactive pair of non-bonding electrons in the ester)

\[
\begin{align*}
\text{A} & \quad \text{O} \quad \text{O} \quad \text{BF}_3 \\
\text{C} & \quad \text{O} \quad \text{O} \quad \text{BF}_3 \\
\text{D} & \quad \text{O} \quad \text{O} \quad \text{BF}_3
\end{align*}
\]

Question 5

MC20b

What are the most likely products of the following Acid/Base reaction?

\[
\begin{align*}
\text{I} & \quad \text{O} \quad \text{O} \\
\text{II} & \quad \text{O} \quad \text{H} \\
\text{III} & \quad \text{H}_3\text{C} - \text{NH}_3 \\
\text{IV} & \quad \text{H}_3\text{C} - \text{N} \\
\text{V} & \quad \text{H}_2\text{C} - \text{NH}_2
\end{align*}
\]

A = I & IV  B = I & III  C = II & IV  D = II & V

Question 6

MC20i

Which of the following reactions is most likely to occur?

\[
\begin{align*}
\text{A} & \quad \text{O} \quad \text{O} \\
\text{B} & \quad \text{O} \quad \text{O} \\
\text{C} & \quad \text{O} \quad \text{O} \\
\text{D} & \quad \text{O} \quad \text{O}
\end{align*}
\]
Question 7
MC20k
Which is the most acidic proton in this molecule, Ha, Hb, Hc or Hd (not all of the C-H bonds are shown in this molecule)? hint, draw all of the conjugate base anions

![Molecule Diagram]

A  Ha  
B  Hb  
C  Hc  
D  Hd

Question 8
MC201
Which is the weakest base? (hint, look for minor resonance contributors)

![Base Diagrams]

A  
B  
C  
D  

QUESTION 9
There are NO INCORRECT answers to this question, ALL answers to this question will be considered correct for grading purposes
What overall final grade do you expect to earn in this class?
A  
B  
C  
D  

QUESTION 10
There are NO INCORRECT answers to this question, ALL answers to this question will be considered correct for grading purposes
How hard did you work on organic chemistry this week (not including watching/attending lectures)
A  Very Hard  
B  Hard  
C  Somewhat Hard  
D  Not very Hard this week