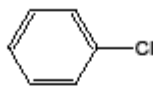
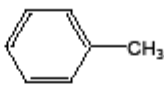
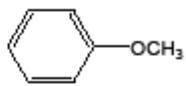

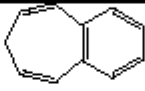
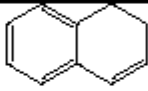
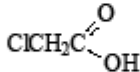
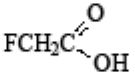
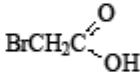
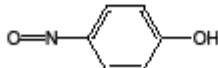
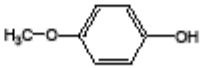

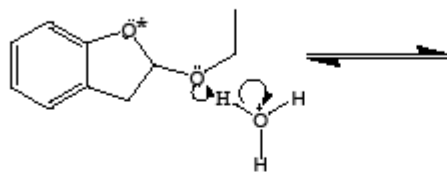


1. (20 Pts) Circle the best answer for each question below.

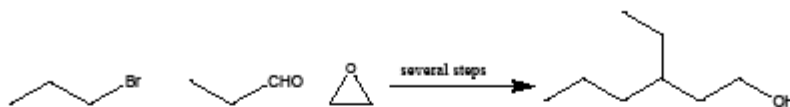
Reacts fastest with a mixture of nitric and sulfuric acid			
Reduces aldehydes but not acids	$\text{LiAlH}_4$	$\text{NaBH}_4$	$\text{Na}_2\text{B}_2\text{O}_7$
A reduction reaction	An Aldehyde to a carboxylic acid	A ketone to a secondary alcohol	A primary alcohol to an aldehyde
An oxidation reaction	Wolff-Kishner Reaction	Clemmenson Reaction	Jones Reaction
Strongest acid			
Replaces diazonium salts with hydrogen	$\text{HONO}$	$\text{H}_3\text{PO}_2$	$\text{H}_3\text{PO}_4$
Has the weakest conjugate base			
Deactivating and ortho para directing	$-\text{Cl}$	$-\text{N}(\text{CH}_3)_2$	$-\text{CH}=\text{CH}_2$
Reduces $-\text{C}=\text{C}-$ bond bonds faster than $-\text{C}=\text{O}$ bonds	$\text{NaBH}_4$	$\text{LiAlH}_4$	$\text{Rh/C}$ and $\text{H}_2$
Strongest acid			

2. (20 pts) Please show the step by step mechanism for the reaction of the compound below with aqueous acid. You must show all products and how they are produced. Show each step using the curved arrow convention. There is one oxygen atom labeled with the isotope  $^{18}\text{O}$  (marked with the symbol  $*$ ). Please indicate where one would find the label in the products of the reaction. I started the process for you and earned all of you a minimum of 1 point on the problem! If you don't write neatly, you can lose even that point. Imagine having to follow 100 of these and you will surely understand why there will be no credit given if the work is illegible. BE NEAT!

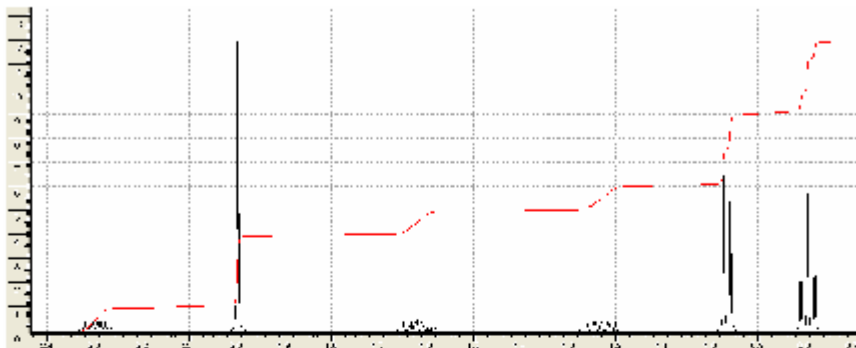


Chemistry 318N-06      Exam II      Name \_\_\_\_\_

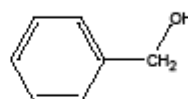
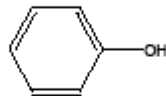
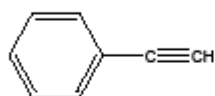
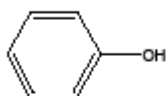
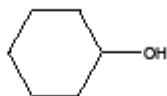
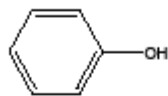
3. ( 5 pts) Show how to synthesize the following alcohol using 1-bromopropane, propanal and ethylene oxide as the only sources of carbon. (homework 16.20)



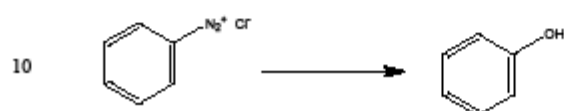
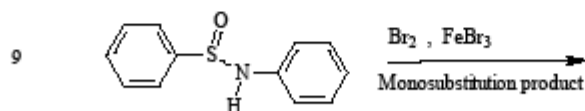
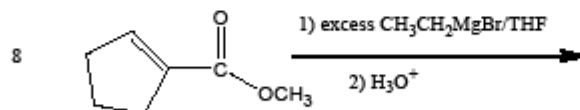
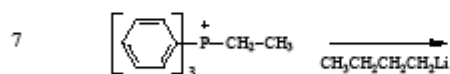
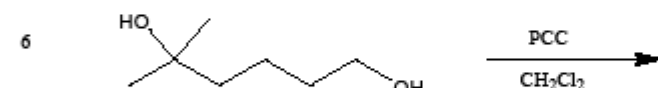
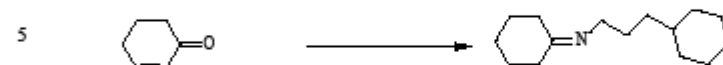
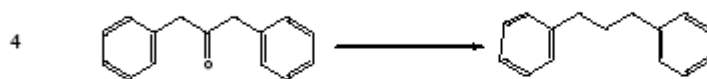
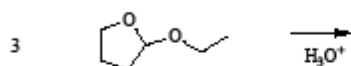
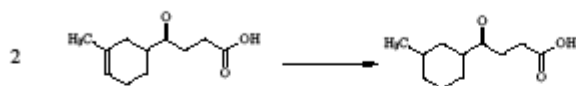
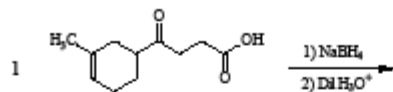
4 ( 10 Pts) The infrared spectrum of a compound A,  $C_6H_{12}O$ , shows a strong sharp peak at  $1724\text{cm}^{-1}$ . From this information and the  $^1\text{H-NMR}$  spectrum below, deduce the structure of compound A. (Homework Problem)



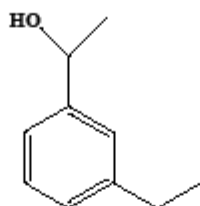
5 ( 6 Pts) Number the molecules in each set in order of increasing acidity (from least acidic (1) to most acidic (3) in each case) (Homework 21.35)



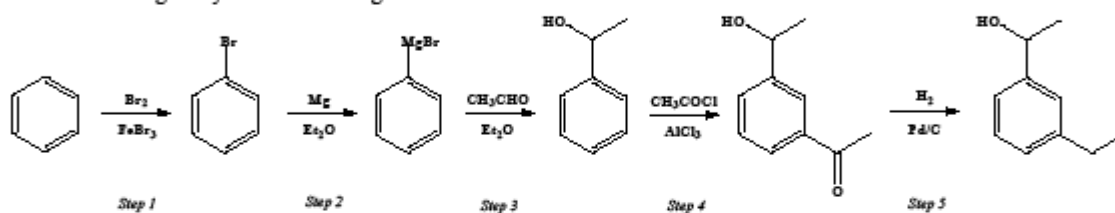
6. (10 pts) Provide the missing reactants, reagents or products.



7. (9pts) You've been hired by a chemical engineering company at a huge salary. Your boss tells you to design a synthesis for the following molecule.



Rather than do it yourself, you ask the Aggie intern to propose a synthetic scheme. He gives you the following outline.



The poor Aggie is not going to get a good recommendation because there are three fundamental errors in his proposed synthesis. Indicate which steps contain errors and describe in **8 words or less** what the problem is.

Error 1:

Error 2:

Error 3:

8. (20 pts) Your stock room is well equipped with glassware, inorganic reagents, solvents and such and it has a rich inventory of compounds with less than 4 carbons atoms (any one, two and three carbon compounds are available.) It also has a large stock of pure benzene. Please outline a step by step path to the valuable compounds below using only materials from your stockroom. Work backwards and please write neatly. You may choose any two of the problems to do. The first two you present are the two that will be graded. *Please only do two of the problems.*

