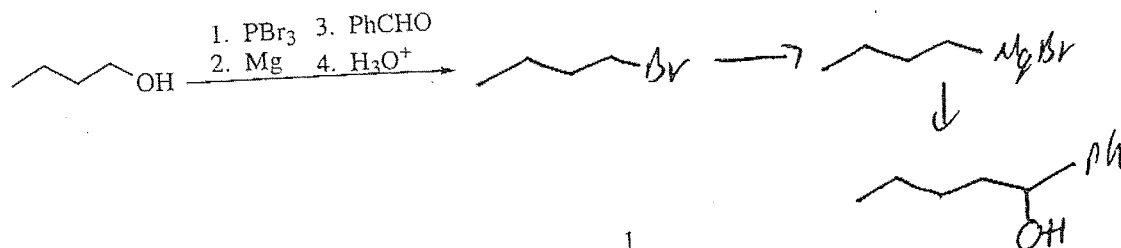
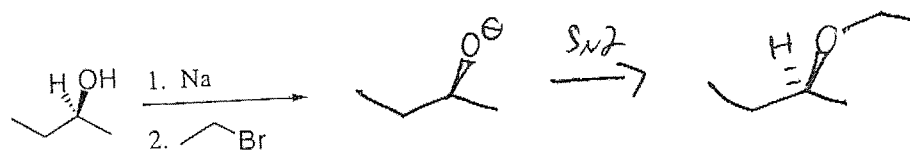
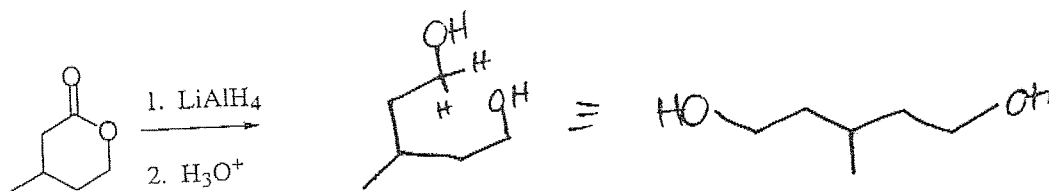
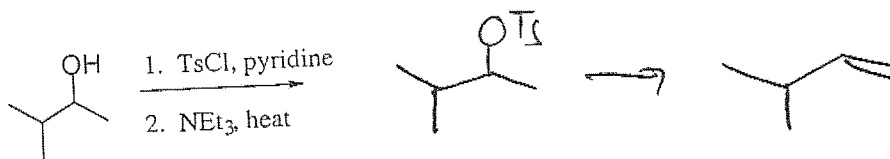
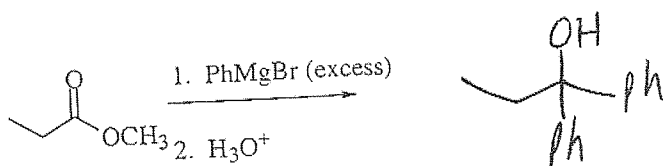
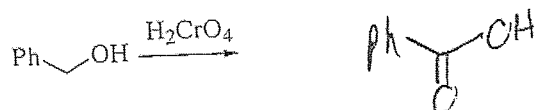
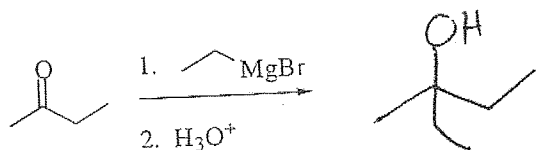
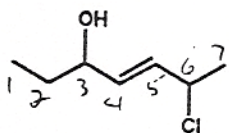


1. Give the major product for the following reactions. (3 points each)

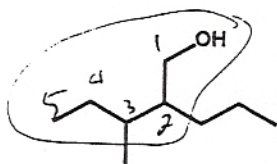


2. Give Names or structures for the following: (9 points)

para-ethylphenol

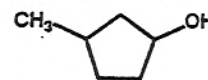
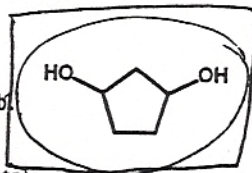
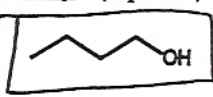


(E)-6-chlorohept-4-en-3-ol



3-methyl-3-propylpentan-1-ol

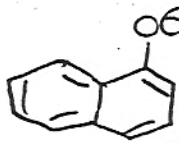
3. For each of the following pairs, circle the one that is higher boiling and put a square around the one with the higher water solubility. (4 points)



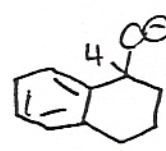
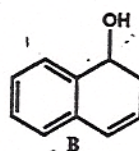
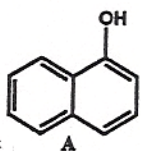
4. Which of the following statements is true? (4 points)

- a. When an ether solution of A and B in a separatory funnel is treated with neutral water, only B remains in the ether layer. *Both*
- b. When an ether solution of A and B in a separatory funnel is treated with neutral water, neither A nor B remains in the ether layer. *Both*
- c. When an ether solution of A and B in a separatory funnel is treated with basic water (NaOH/H<sub>2</sub>O), both A and B remain in the ether layer. *⊙*
- d. When an ether solution of A and B in a separatory funnel is treated with basic water (NaOH/H<sub>2</sub>O), only B remains in the ether layer. *⊙*

*taken directly from book problem*



*resonance*

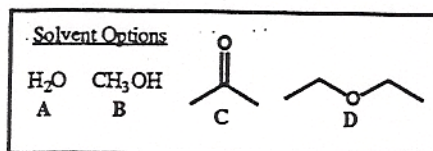
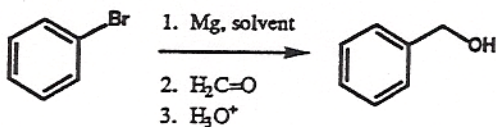


*NO resonance*

5. For the following transformation, which of the following statements is true? (4 points)

- a. *⊙* D is the only acceptable solvent
- b. C is the only acceptable solvent
- c. C and D are both acceptable solvents
- d. B, C, and D are all acceptable solvents
- e. A and B are the only acceptable solvents

*A+B would protonate the C would react as well*

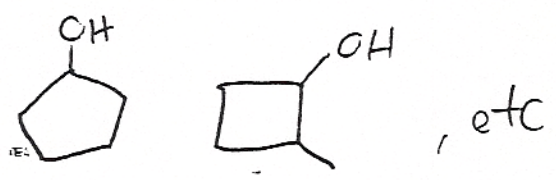


6. Suggest a possible structure for an unknown A whose formula is  $C_5H_{10}O$  and gives the following chemical test results. (5 points)

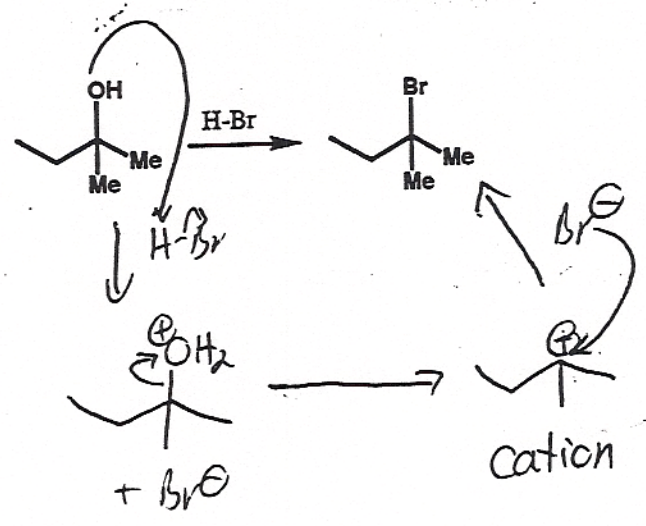
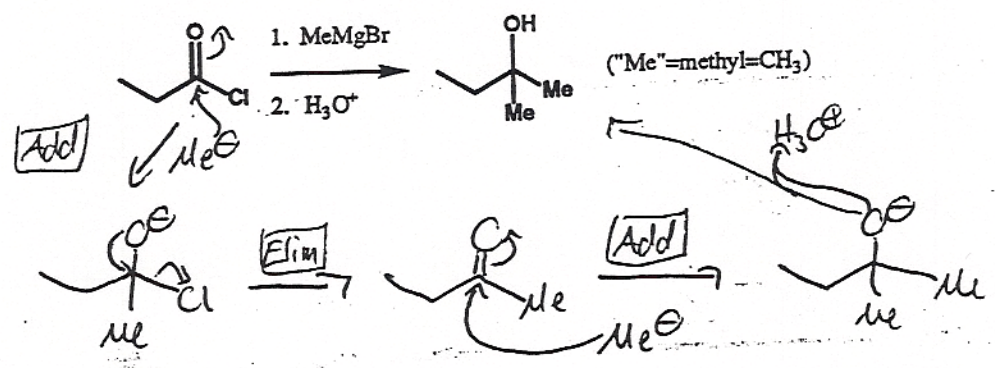
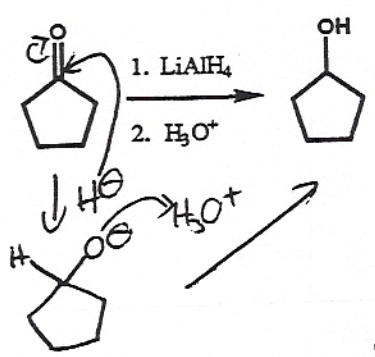
Formula	$C_5H_{10}O$	
Hydrogenation Test	$H_2/Pt$	No reaction
Chromic Acid Test	$H_2CrO_4$	Turns Green
Lucas Test	$HCl/ZnCl_2$	Reacts within 5 minutes

$EU=1$   
 $EU=1$  ring or DB  
 no DB  $\Rightarrow$  cyclic  
 $1^\circ$  or  $2^\circ$  alcohol  
 not  $1^\circ, 2^\circ$

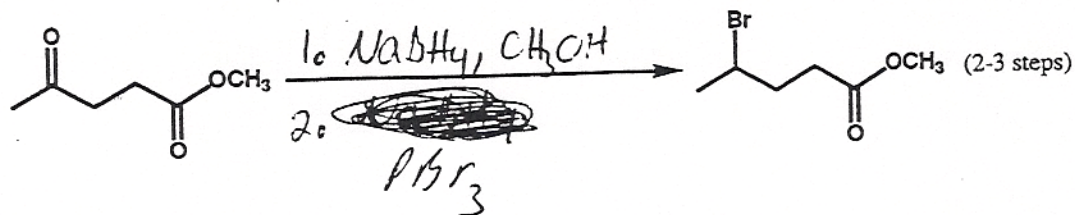
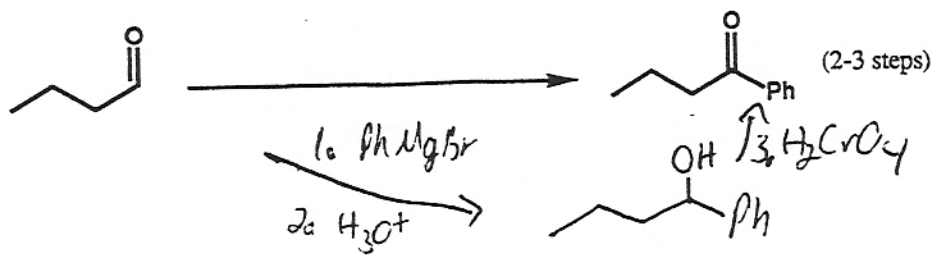
Summary: 
 $2^\circ$  alcohol,  
 cyclic



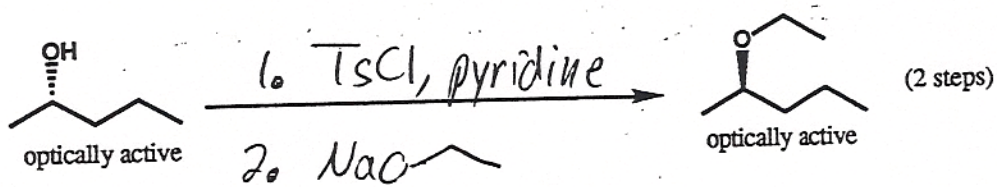
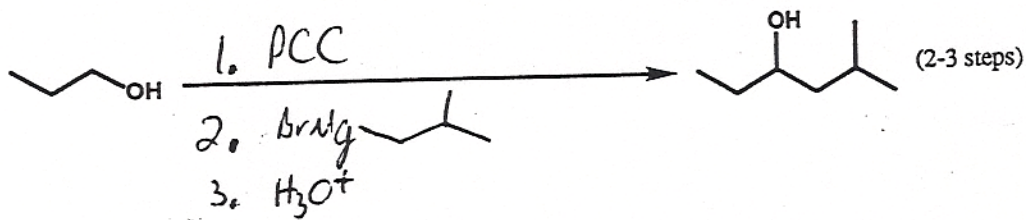
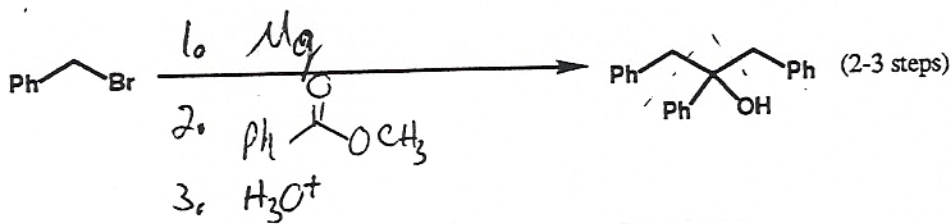
7. Provide the mechanisms for the following reactions (3, 5, and 5 points)



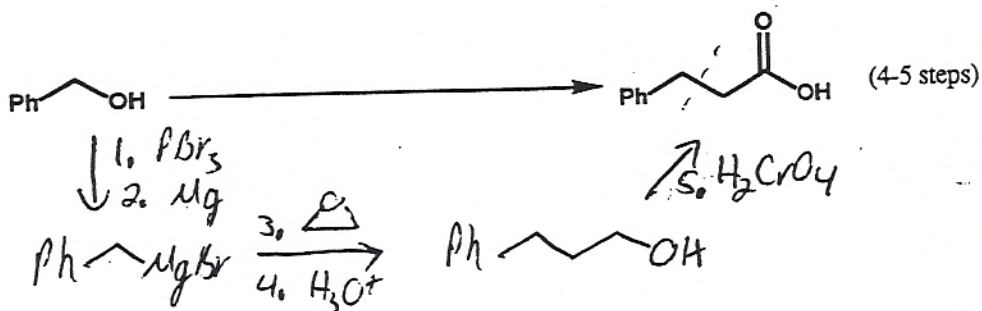
8. Provide the reagents necessary to accomplish the following transformations (4 points each)



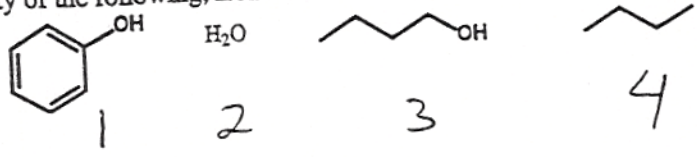
LiAlH<sub>4</sub>  
not ideal,  
would also  
react with  
ester



inversion  
 $\Rightarrow S_N2$



9. Rank the acidity of the following, from most acidic (1) to least acidic (4). (4 points)



10. Design syntheses of the following. (6 points each). Allowed starting materials (same as practice) include: cyclopentanol, any esters, ethylene oxide, formaldehyde, iodomethane, any acyclic alcohol or alkene with  $\leq 4$  carbons, any "inorganic" agents (things that won't contribute carbons to your skeleton)

