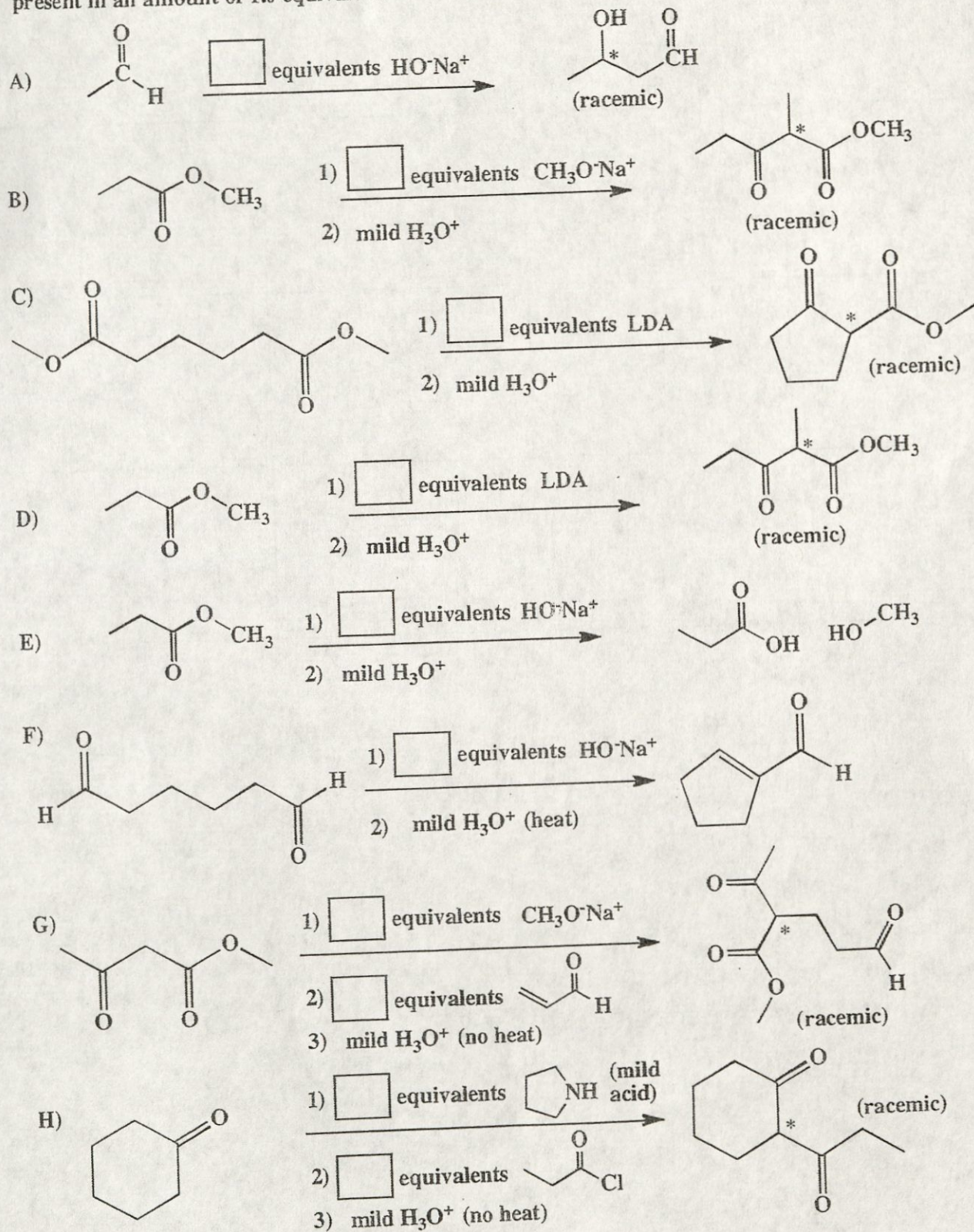
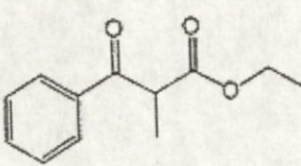
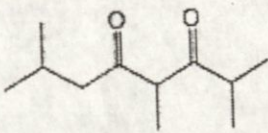
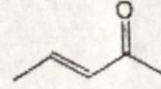
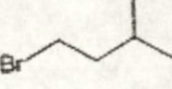
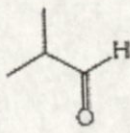
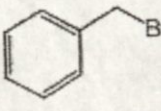
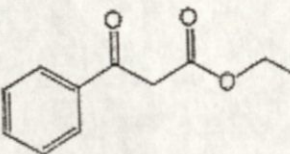
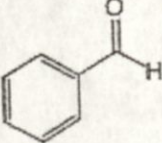
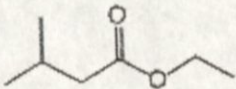
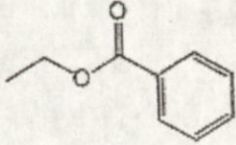
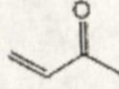
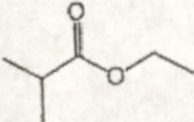
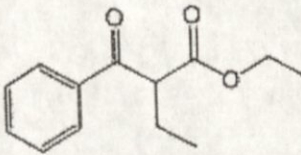
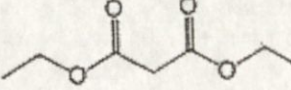
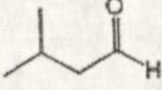
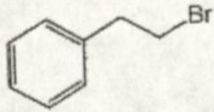


Signature _____

11. (2 pts each) In each of the boxes over an arrow, write the minimum number of equivalents of the specified reagent required to carry out the reaction shown to completion. If only a catalytic amount is needed, write "CAT". Note: You must assume the carbonyl compound starting material is initially present in an amount of 1.0 equivalent.



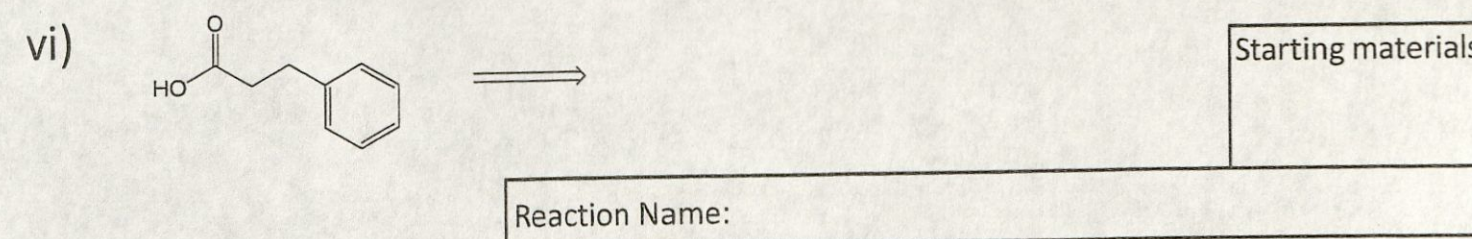
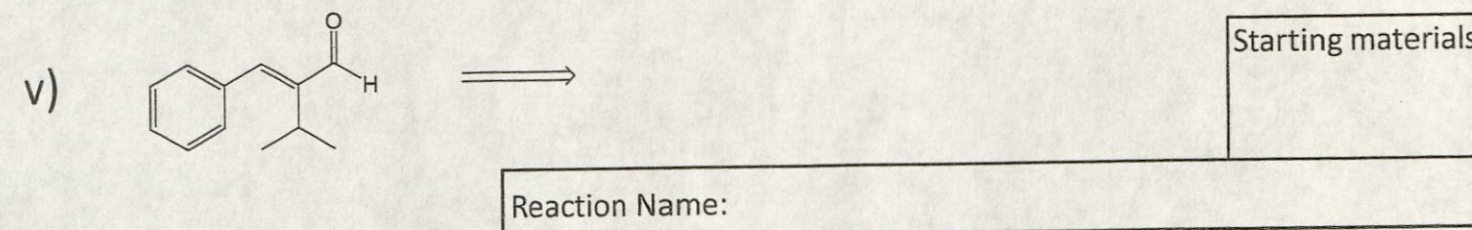
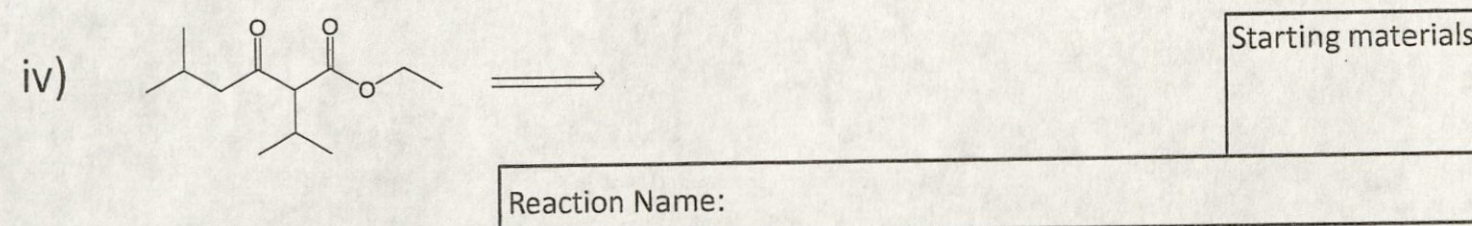
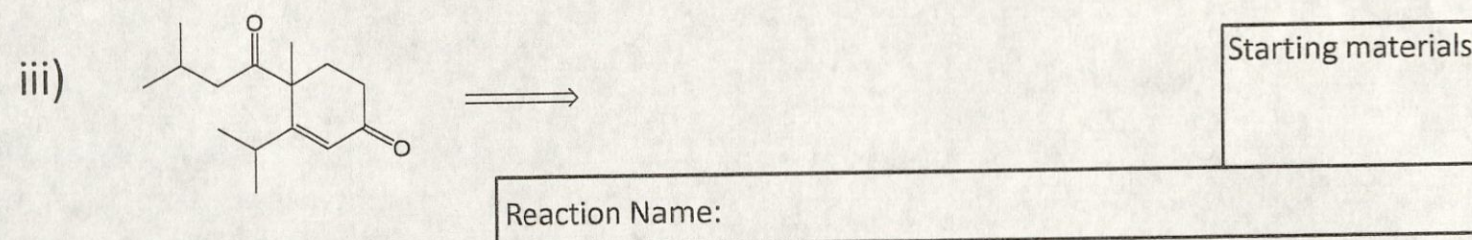
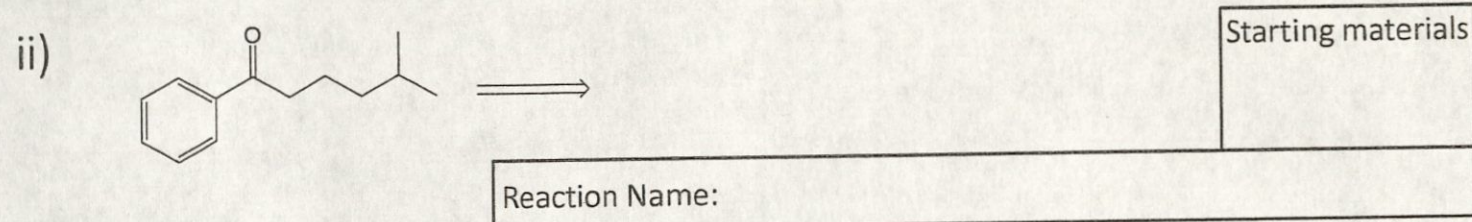
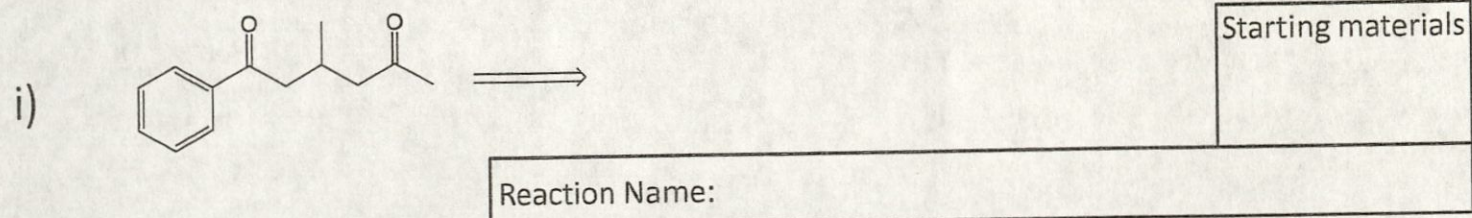
Use retrosynthesis to provide the starting materials and name of reaction for each product. Each letter (A-P) can be used any number of times or not at all.

 <p>A</p>	 <p>B</p>	 <p>C</p>	 <p>D</p>
 <p>E</p>	 <p>F</p>	 <p>G</p>	 <p>H</p>
 <p>I</p>	 <p>J</p>	 <p>K</p>	 <p>L</p>
 <p>M</p>	 <p>N</p>	 <p>O</p>	 <p>P</p>

Possible Reaction Names:

- Aldol Condensation (with Dehydration)
- Claisen Reaction
- Acetoacetate Synthesis
- Malonic Ester Synthesis
- Michael Addition – Malonic Ester Synth
- Michael Addition – Acetoacetate Synth
- Robinson Annulation

Use retrosynthesis to provide the starting materials and name of reaction for each product. Each letter (A-P) can be used any number of times or not at all.



Signature _____

Pg 22 _____(13)

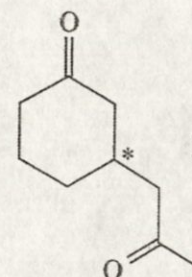
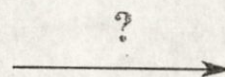
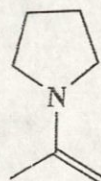
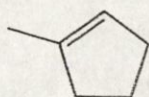
This one is EXTRA CREDIT. It DOES NOT COUNT IN THE POINT TOTAL for the exam but it is a chance to add points to your score.

22. Using any reagents turn the starting material into the indicated product. All carbon atoms in the product must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (*) and make sure to right "Racemic" where appropriate.

Remember, all of the carbons of the product must come from the given starting material.

(13 pts)

F)



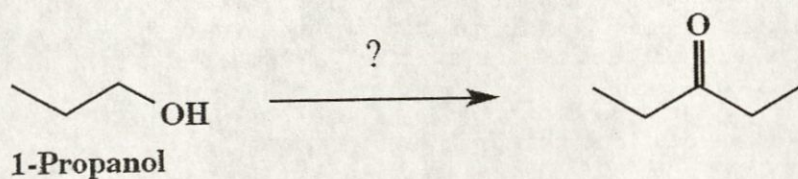
Racemic

Using any reagents turn the starting material into the indicated product. All carbon atoms in the product must come from the starting material. Draw all molecules synthesized along the way. When in doubt, draw the molecule! Label all chiral centers with an asterisk (*) and make sure to right "Racemic" where appropriate. You will notice a theme in these problems in that you will be starting with very simple structures and making more complex products.

Remember, all of the carbons of the product must come from the given starting material.

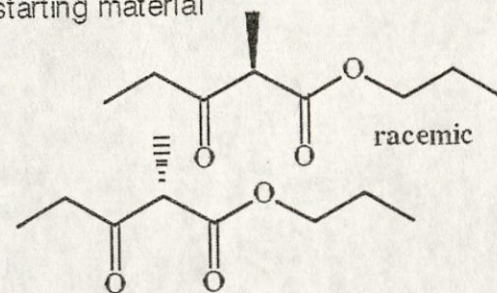
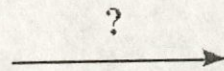
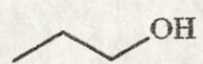
(13 pts)

B)



All the carbon atoms of the product must come from the starting material

(10 pts)



(7 pts)

