

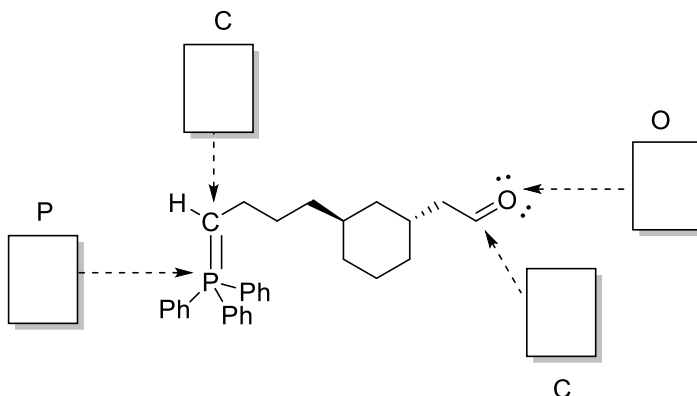
Welcome! Welcome!

To the 2<sup>nd</sup> term Quarter Quell Examination

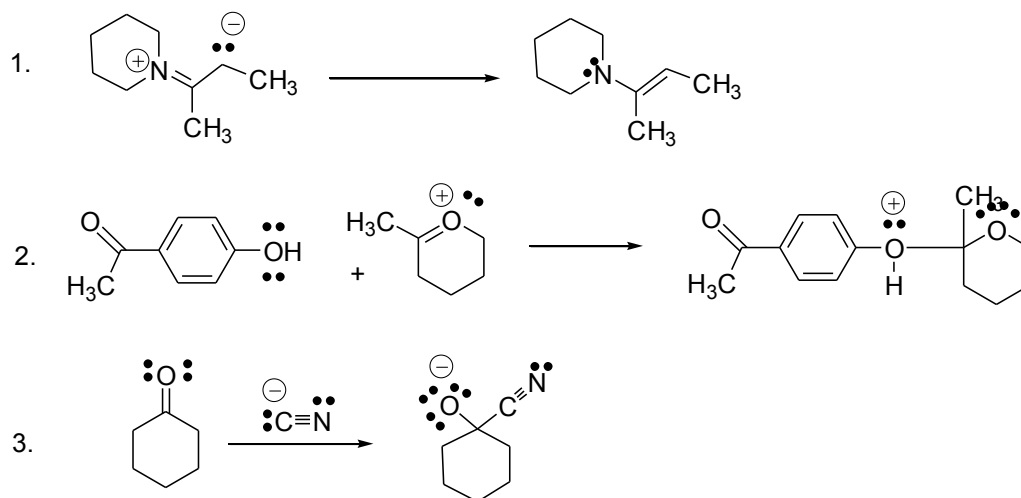


Name: \_\_\_\_\_

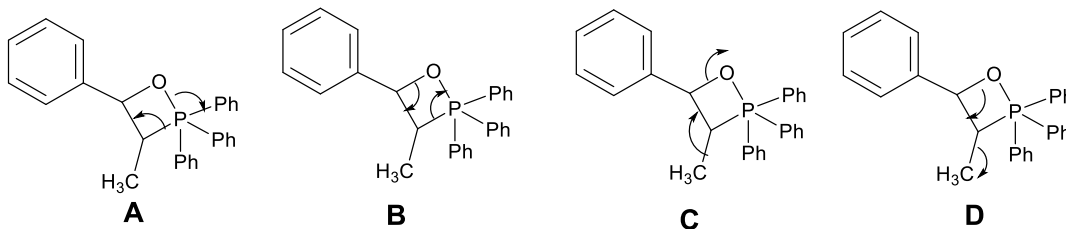
**Problem 1 (4 points):** For the molecule below, determine if the selected atoms are Nucleophilic (**N**) or electrophilic (**E**) in nature. Write your answers in the boxes.



**Problem 2 (6 points):** Please provide arrows that would indicate how the starting compounds are converted to the given ending structures.

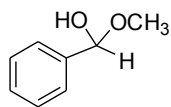


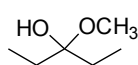
**Problem 3 (4 points):** For the Wittig reaction, a phosphorous *ylide* will react with an aldehyde or ketone so as to generate an alkene. An intermediate along the reaction pathway is a four-membered oxaphosphetane ring. Choose the example that represents how this intermediate collapses to form the alkene and by product.

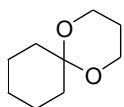


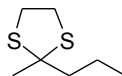
**Problem 4 (6 points):** Determine the type of functionality present in the given molecules:

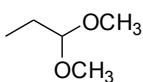
Hydrate        Hemi-Acetal        Acetal        Ketal        Hemi-Ketal        Dithiane / Thioketal

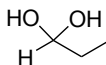




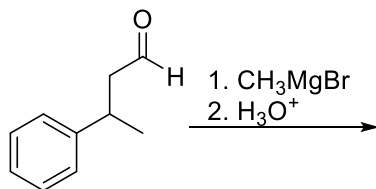
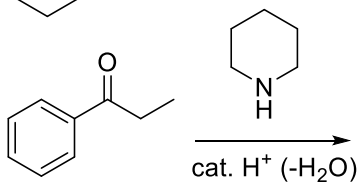
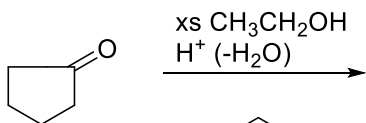
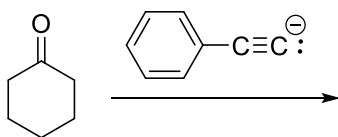
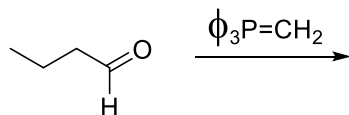
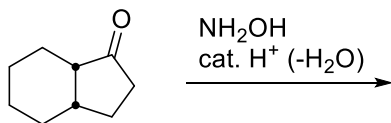






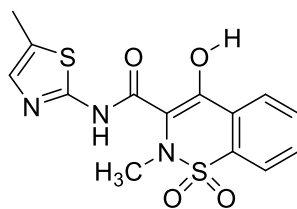



**Problem 5 (24 points):** Draw the final major product for each reaction.

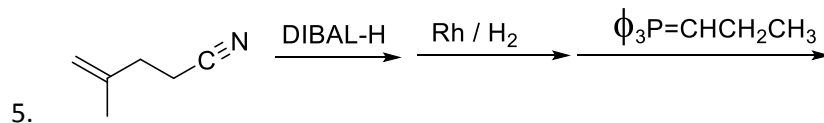
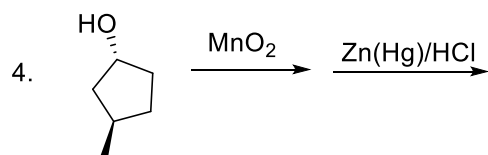
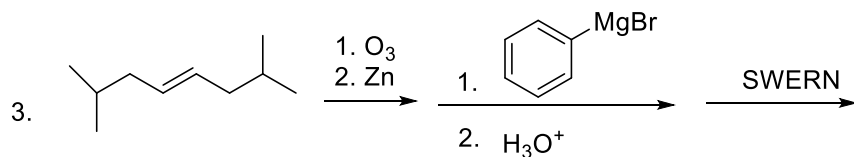
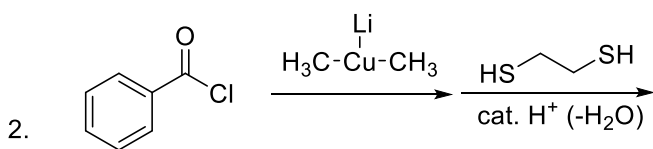
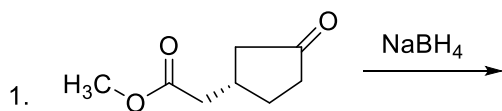


**Problem 6 (3 points):** Meloxicam is a non-steroidal anti-inflammatory drug (NSAID) used to reduce pain and fever. Place a circle over the atoms that make up an Enol functionality.

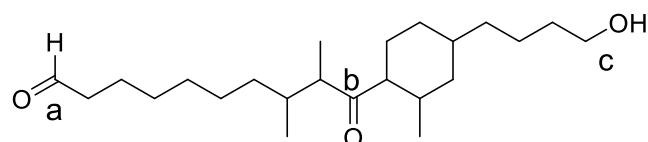
**Meloxicam**



**Problem 7 (15 points):** Pick only three problems and draw the final product.



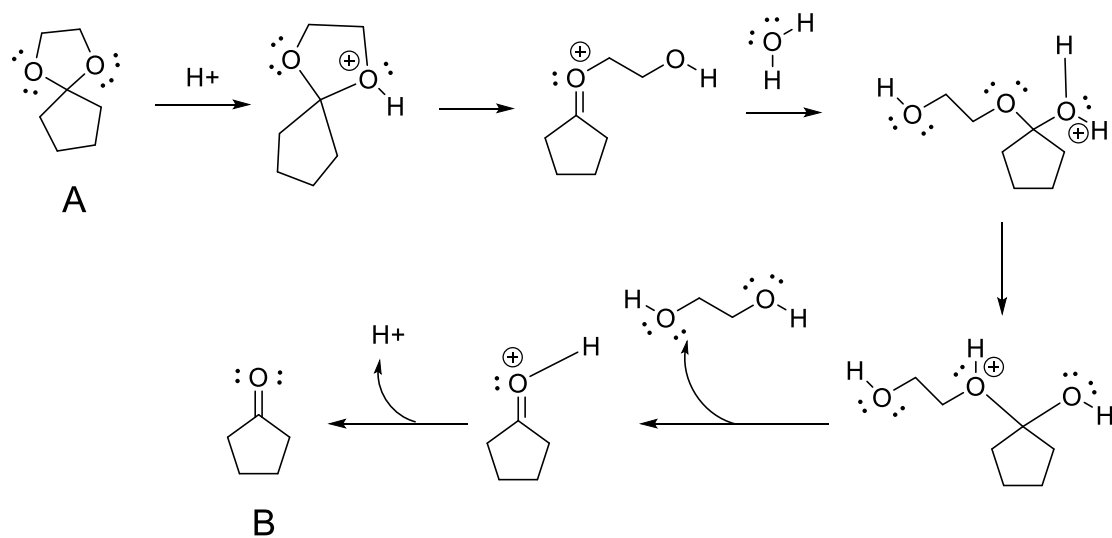
**Problem 8 (4 points):** Use the given molecule to match with the statements.



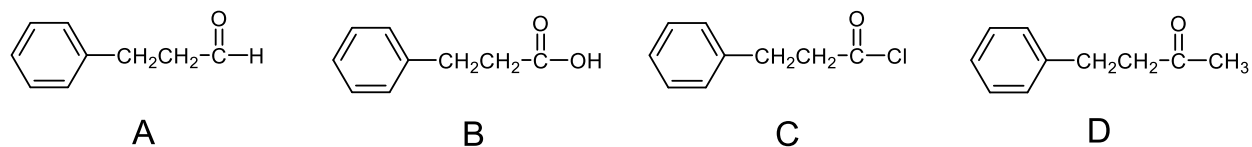
\_\_\_\_\_ Reacts with dihydropyran DHP

\_\_\_\_\_ Reacts with HO-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-OH fastest

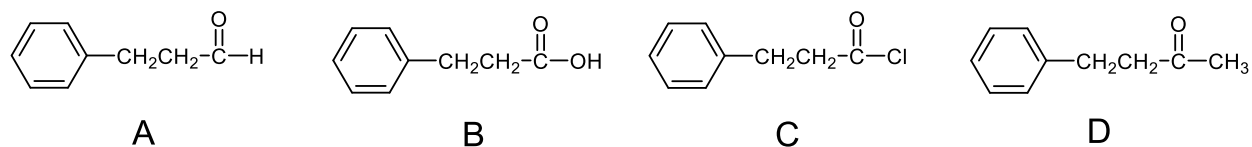
**Problem 9** (6 points): Provide any arrows that would illustrate how this mechanistic transformation occurs.



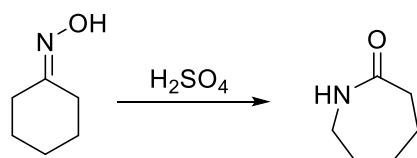
**Problem 10** (5 points): Circle the compound below that would give a (+) result for an Iodoform test.



**Problem 11** (5 points): Circle the compound below that would give a (+) Tollen's test.

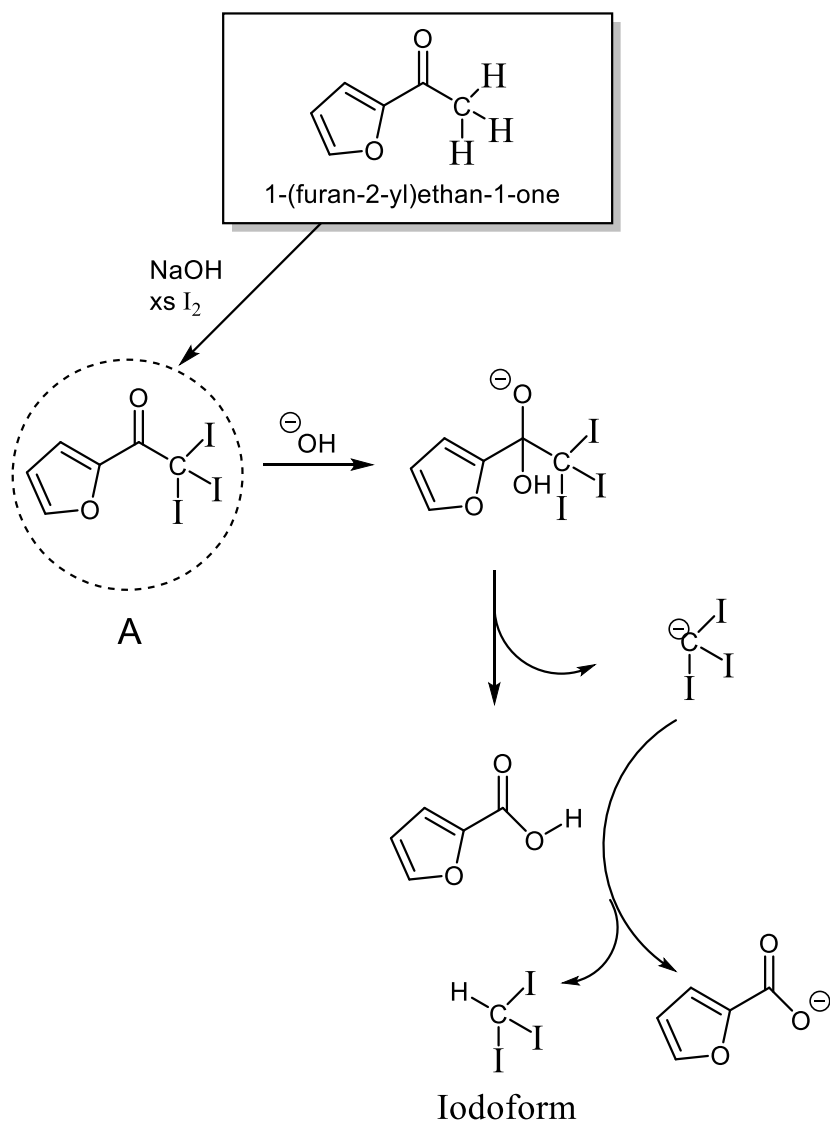


**Problem 12** (3 points): What is the name of the reaction illustrated below?

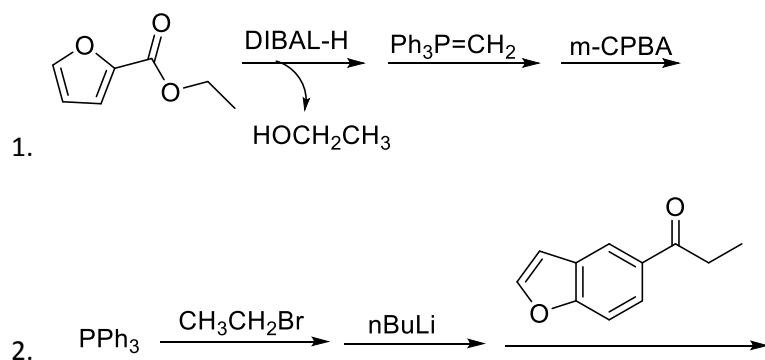


**Problem 13** (10 points): Below is a partial mechanism for an Iodoform test. The starting methyl ketone will undergo reaction with a basic solution of iodine to form the tri-iodinated compound (A). This is an intermediate structure which will react further with hydroxide to actually generate the Iodoform precipitate.

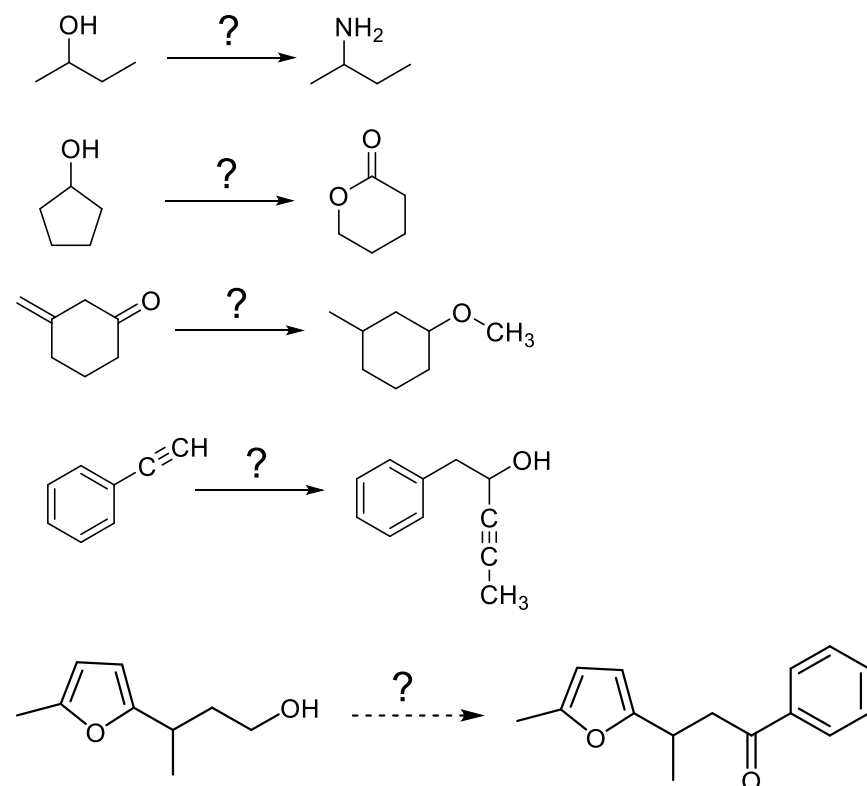
Starting with compound (A) draw any arrows for the truncated mechanism which accounts for each of the given mechanistic steps as they cascade to yield Iodoform and the end carboxylate anion.



**Problem 14** (5 points): Pick only one problem and draw the final product.



**Problem 15** (5 points): Pick only one problem and suggest a list of reagents for that transformation.



## Bonus Problem

Pick only one problem and provide a detailed step-by-step mechanism with arrows and intermediates.

