

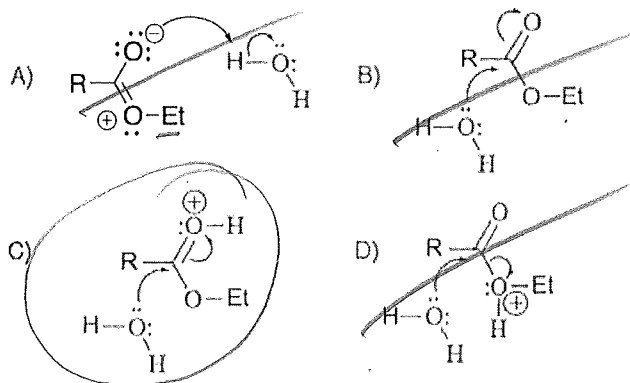
# You are not allowed to post this key on the internet!

Questions 1 to 10, 2 pts each: Please use the front of the Scantron form.

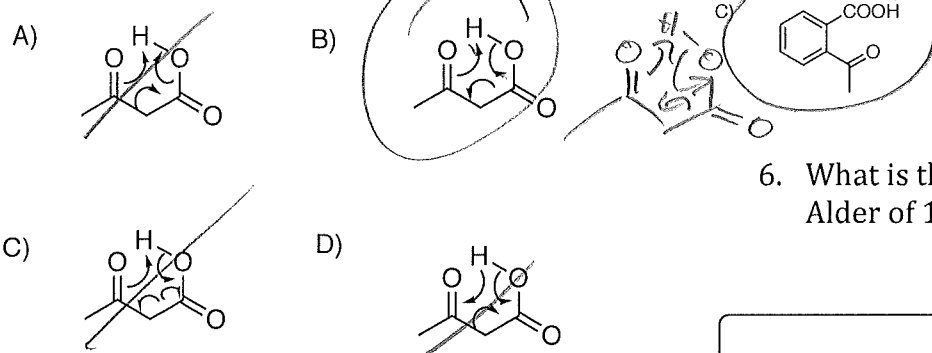
KEY

1. Which of the following correctly describes a key step in the **acid-catalyzed** hydrolysis of the ethyl acetoacetate (=  $\text{CH}_3\text{COCH}_2\text{COOEt}$ )

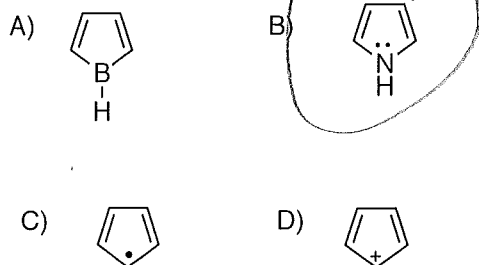
$\text{R} = \text{COCH}_3$



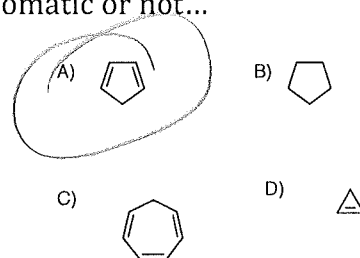
2. Which of the following correctly describes the flow of electrons in the heat induced decarboxylation of acetoacetic acid ( $\text{CH}_3\text{COCH}_2\text{COOH}$ )?



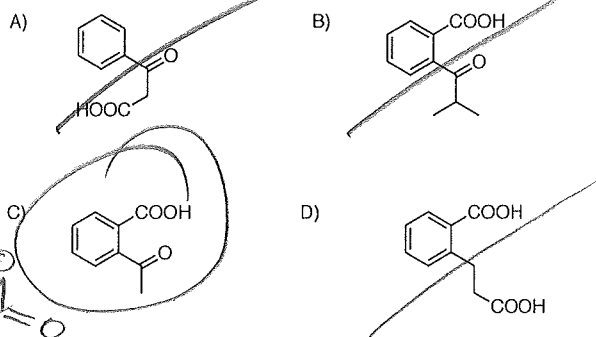
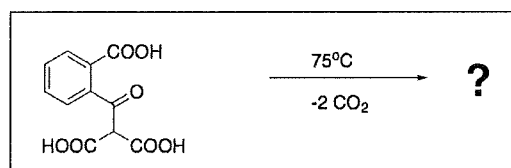
3. Which of the following is aromatic?



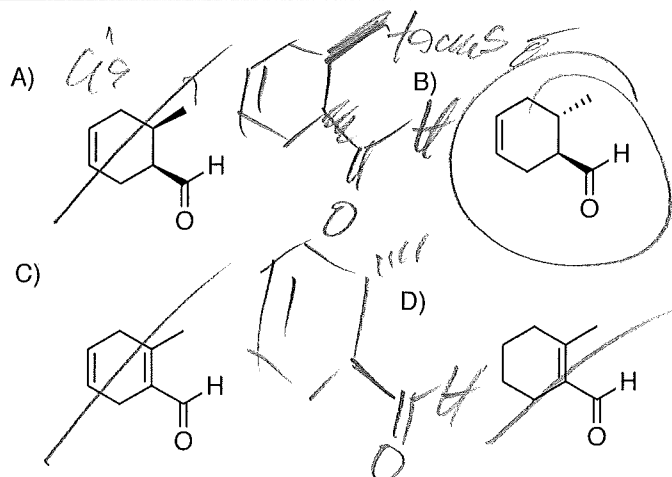
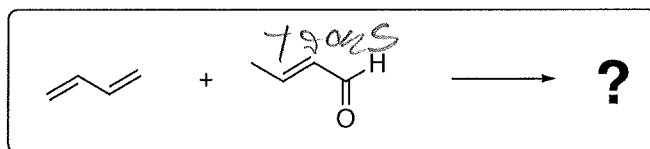
4. Which of the following is most acidic? -To answer this question you need to draw the conjugate base of each compound and ask yourself if that particular anion is aromatic or not...



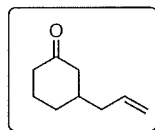
5. What is the product of the following decarboxylation?



6. What is the major product of the Diels Alder of 1,3-butadiene with E-2-butenal?



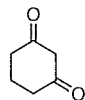
7. How would you synthesize the compound the box?



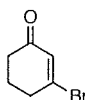
A)



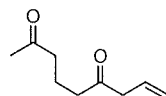
B)



C)

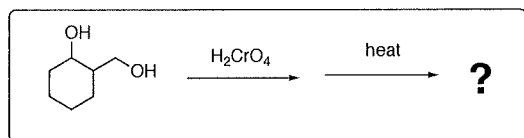


D)



8. What is a major product of the reaction shown in the box? -  $\text{H}_2\text{CrO}_4$  is an oxidation agent. Spectroscopic data of the major product: IR:  $1715\text{ cm}^{-1}$ ,  $^{13}\text{C}$  NMR: 4 signals.

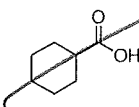
*Sat. ketone*



A)



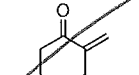
B)



C)

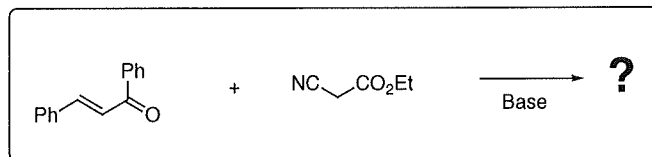


D)

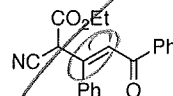


*IR < 1715*

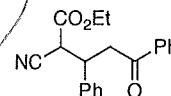
9. What is a major product of the conjugate addition reaction shown in the box?



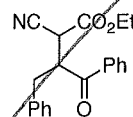
A)



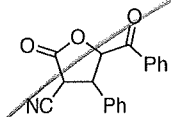
B)



C)



D)



10. Under the harsh conditions of the mass spectrometer both fragmentation and rearrangements to more stable ions may occur. For example toluene shows a base of  $m/z=91$  ( $= \text{C}_7\text{H}_7^+$ ). What is most likely the structure of this ion? - Note: This question asks for the most stable of the ions shown below - You are looking for the ion that is aromatic!!!

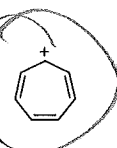
A)



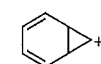
B)



C)



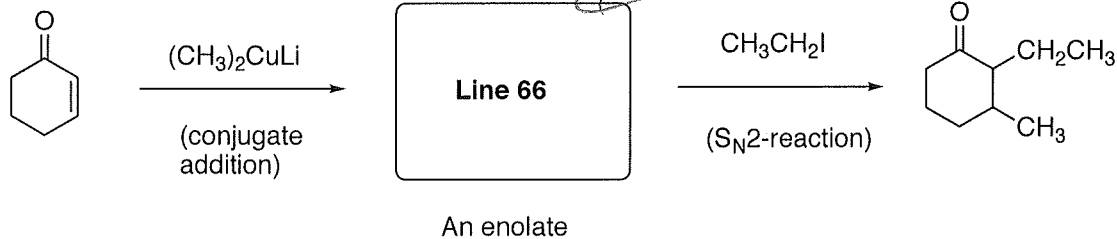
D)



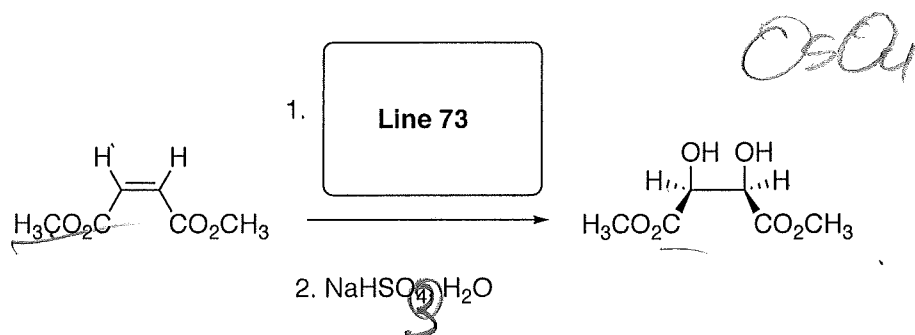
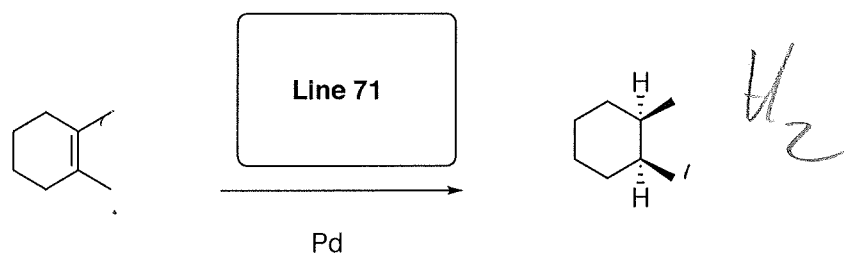
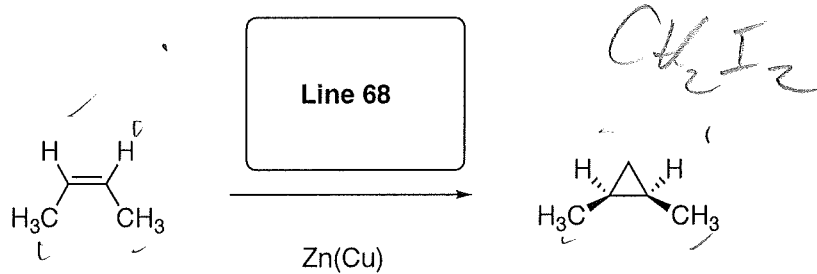
All ions have a formula of  $\text{C}_7\text{H}_7^+$

Please answer problems 11 and 12 on the back of the back of the Scantron form:

11. (1 pt) Please suggest a structure for enolate intermediate.



12. (3 pts) Please provide the reactants or reagents.



END OF QUIZ.