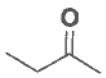
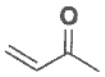
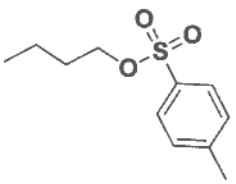
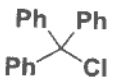
Organic Chemistry 2 **29.1.2014**

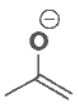
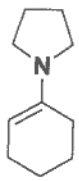
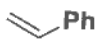
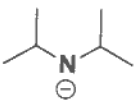
KEM-64046 (4 credits) **Tentinlaatijan:** Nuno Candeias

Material allowed: *Organic Chemistry*, Clayden, Greeves, Warren and Wothers, Oxford Press.
The use of calculators or any electronic devices is not allowed.

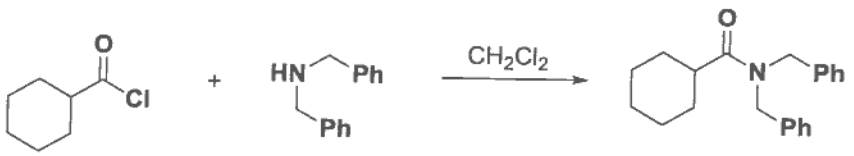
1. Each of these molecules is electrophilic. Identify the electrophilic atom and draw a mechanism for the reaction with a generalized nucleophile Nu^-, giving the product in each case. In case of more than one possibility, draw them all. *(3.0 p)*

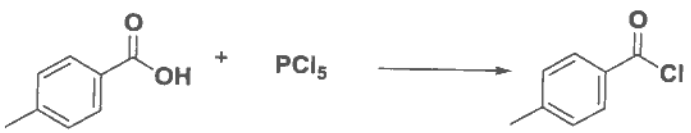
a)  b)  c)  d) 

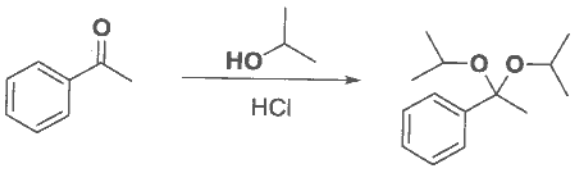
2. Each of these molecules is nucleophilic. Identify the electrophilic atom and draw a mechanism for reaction with a generalized electrophile E^+, giving the product in each case. *(3.0 p)*

a)  b)  c)  d) 

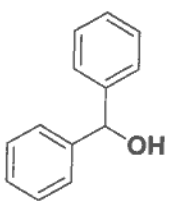
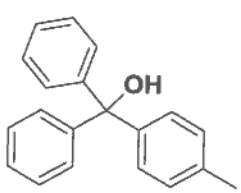
3. Suggest acceptable mechanisms for the following reactions: *(3.0 p)*

a) 

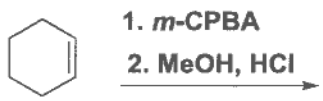
b) 

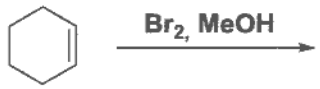
c) 

4. Starting from bromobenzene (C_6H_4Br), suggest synthesis for the following molecules. If more than one step is involved, indicate them clearly (no need to write the mechanisms). *(1.5 p)*

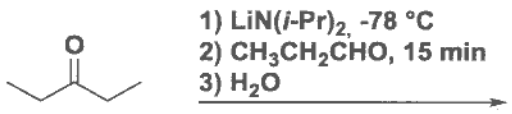
a)  b) 

5. Predict the product(s) formed in each of the following reactions, and write the mechanisms involved. (*2.0 p*)

a) 

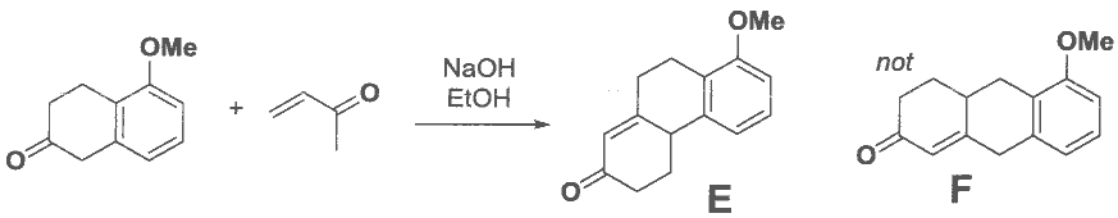
b) 

6. Predict the product formed in each of the following reactions (no need to write the mechanisms). (*2.0 p*)

a) 

b) 

7. The following reaction leads to the exclusive formation of compound **E**. Write the mechanism for formation of **E** justifying the preferential formation of **E** over **F** based on the same mechanism. (*2.0 p*)



8. When $LiAlH_4$ was used to perform the following reaction, the desired product was not obtained. What would be the product under these conditions and suggest reaction conditions to perform the indicated selective reduction? (*1.5 p*)

9. What is the geometrical isomer of **G** that you expect to be formed under the following reaction conditions? Draw the chemical structure of **H**. Justify your answer based on the reaction mechanisms of the first reaction. (*2.0 p*)