

Organic II
Assignment # 7
Spring 2021

Name: _____

1) Convert the following functional class IUPAC names to a substitutive name.

a) Dibenzyl ketone

b) Ethyl isopropyl ketone

c) Methyl 2,2-dimethylpropyl ketone

d) Allyl methyl ketone

e) Vanillin

f) Glutaraldehyde

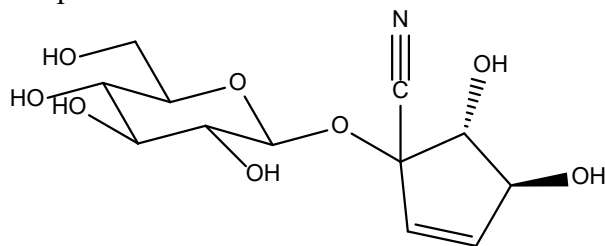
g) Glyceraldehyde

2) Sketch the hydrogen bonding between benzaldehyde and water.

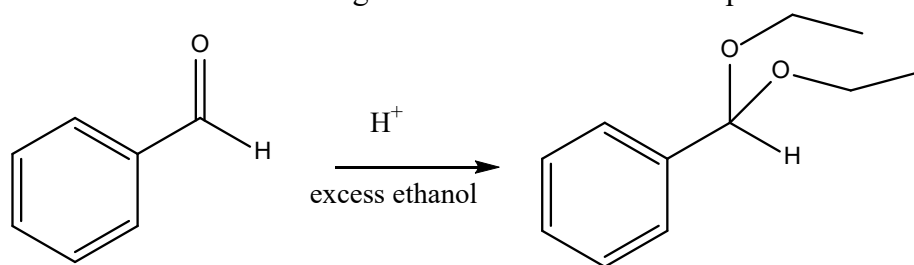
3) a) Show how 2-butanone could be prepared by a procedure in which all of the carbons originate in acetic acid.

b) Two species of ants found near the Mediterranean use 2-methyl-4-heptanone as an alarm pheromone. Suggest a synthesis of this compound from two 4-carbon alcohols.

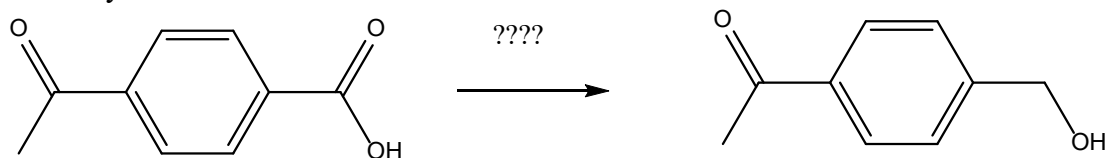
4) Gynocardin is a naturally occurring cyanogenic glycoside having the structure below. What cyanohydrin would you expect to be formed on hydrolysis of gynocardin, and to what ketone does this cyanohydrin correspond?



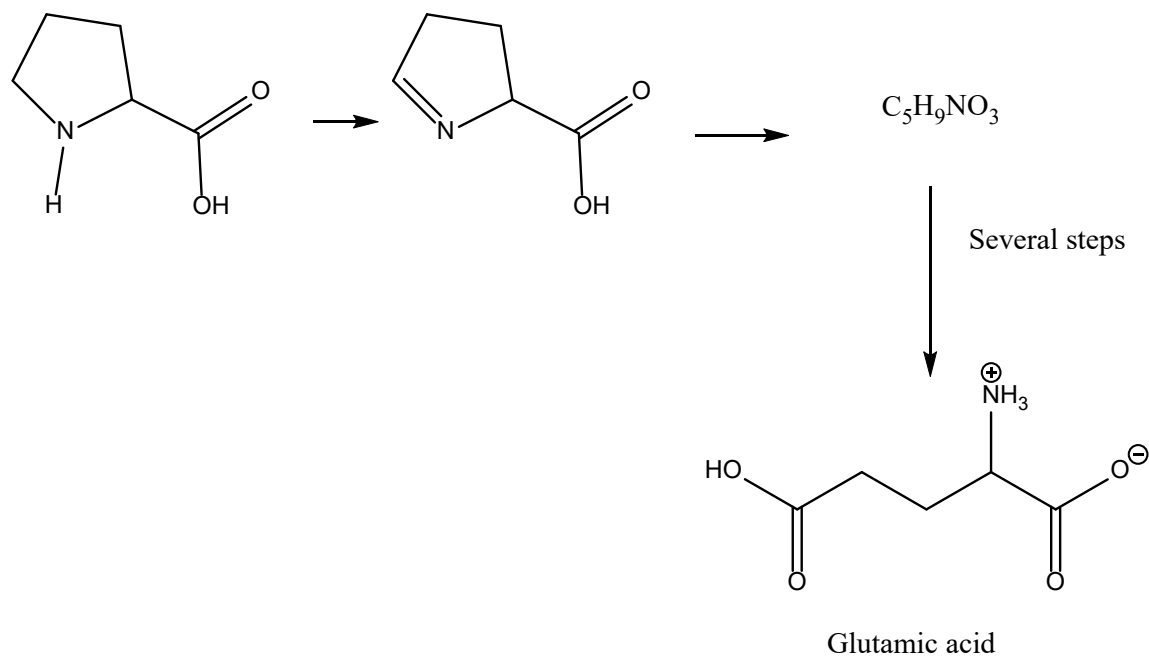
5) Give the mechanism for the following reaction. Show EVERY step.



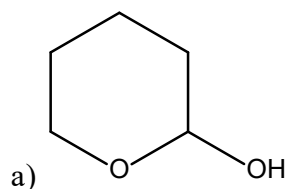
6) Outline a synthesis outlined below.



7) Not all biological reactions of amino acids involving imine intermediates require pyridoxal phosphate. The first step in the conversion of proline to glutamic acid is an oxidation giving the imine shown. Once formed, this imine undergoes hydrolysis to a species having the molecular formula $C_5H_9NO_3$, which then goes on to produce glutamic acid. Suggest a structure for $C_5H_9NO_3$ species. There are two reasonable possibilities: one is a hemiaminal, the other is not cyclic.

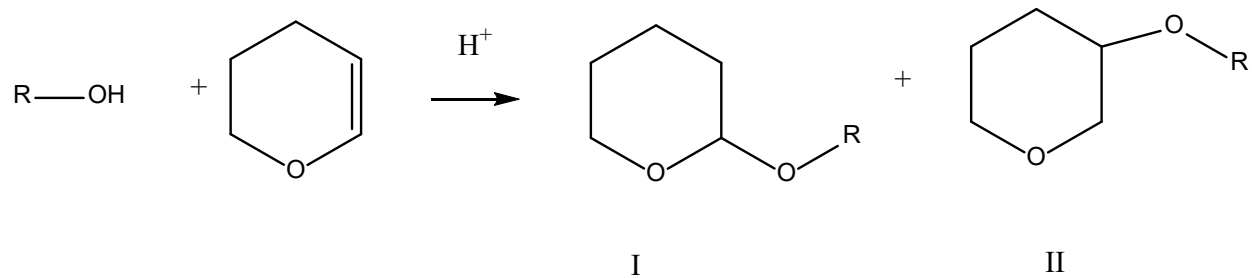


8) Compounds that contain both carbonyl and alcohol functional groups are often more stable as cyclic hemiacetals or cyclic acetals than as open-chain compounds. Deduce the structure of the open-chain form of the following examples.





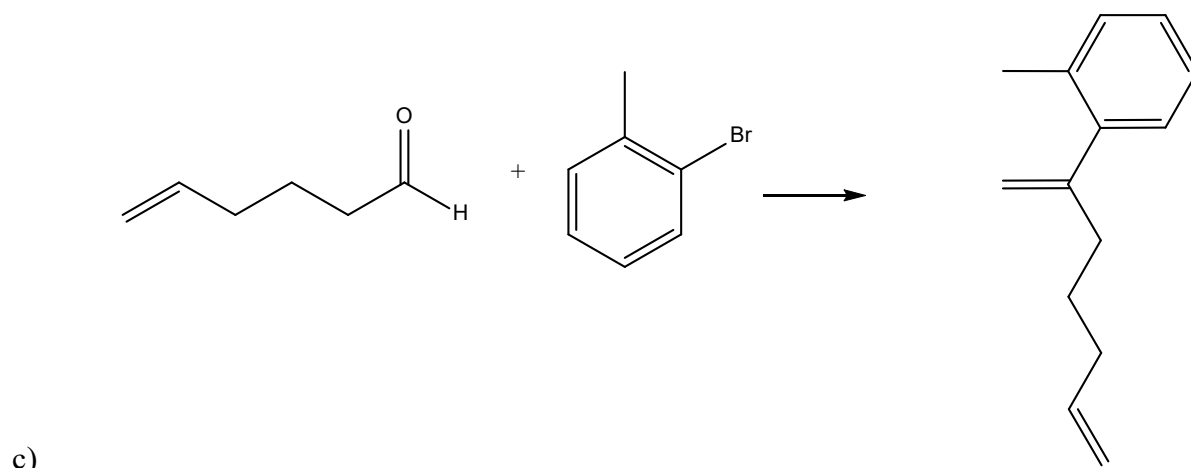
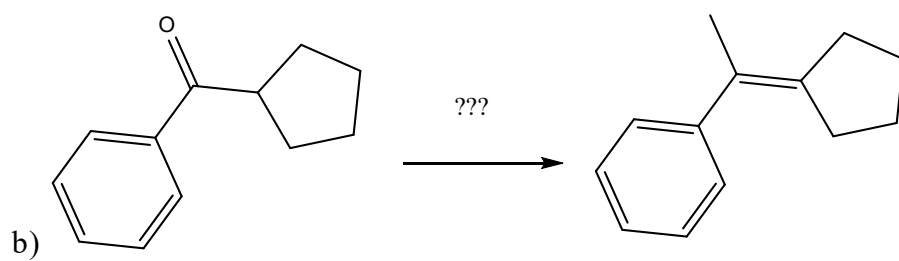
9) Alcohol functions can be protected as tetrahydropyranyl ethers (THPs) by acid-catalyzed addition to dihydropyran according to the equation below.



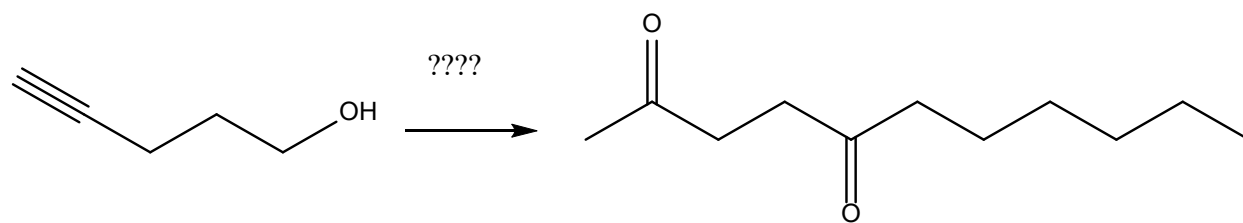
Addition of the alcohol to dihydropyran is regiospecific in that I is formed to exclusion of II. Give a mechanism to explain the observed regioselectivity.

10) Outline the synthesis of the following compound using any necessary organic or inorganic reagents.

a) 1,1,5-Trimethylcyclononane from 5,5-dimethylcyclononane



d)



e)

