Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF TECHNOLOGY IN APPLIED CHEMISTRY

BTAC

ACH 4403: ORGANIC SYNTHESIS

SPECIAL/SUPPLEMENTARY EXAMINATION

MACRH 2014 SERIES

2 HOURS

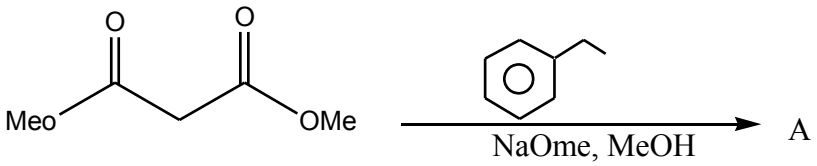
Instructions to candidates:

This paper consists of **FIVE** questions
Answer question **ONE** (compulsory) and any other **TWO** questions

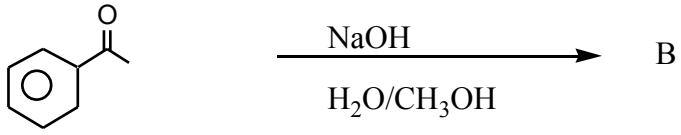
Question ONE

a) Draw the structure(s) of the major product(s) formed in the following reaction.

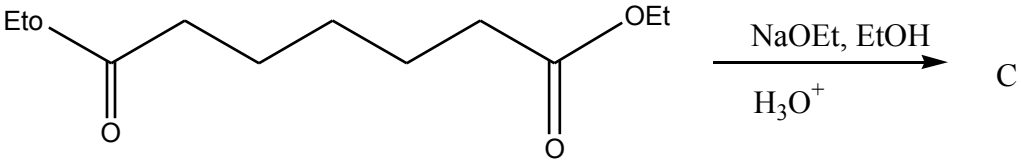
(i)



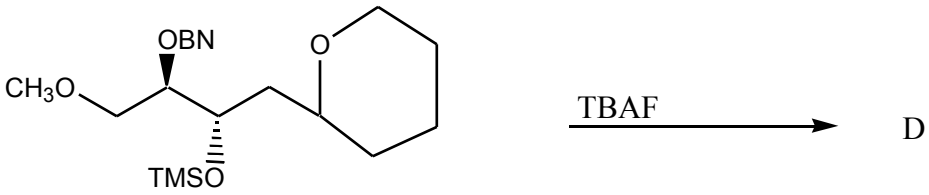
(ii)



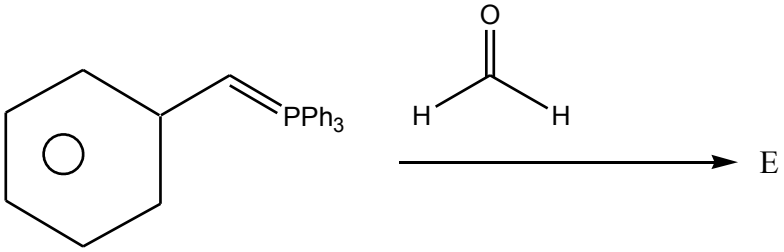
(iii)



(iv)

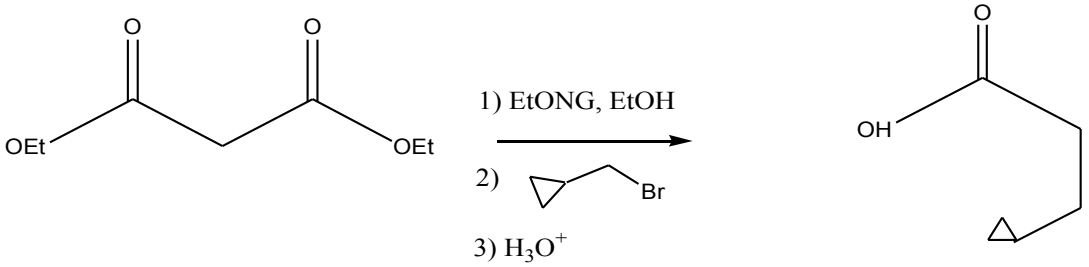


(v)

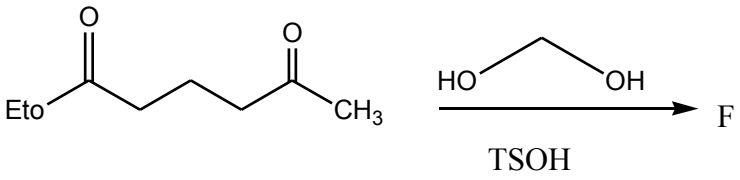


b) Using curly arrows, write a possible reaction mechanism the formation of the product in the reaction below (8marks)

(i)

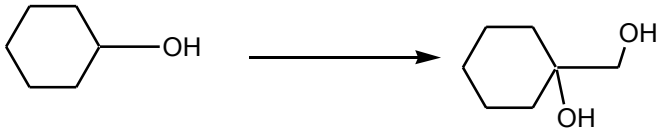


(ii) Draw the structure of the product in the following reaction

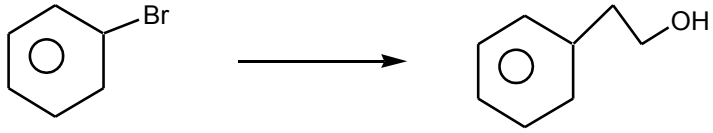


c) Provide the reagents necessary to transform the given starting material to the desired product more than one step may be necessary

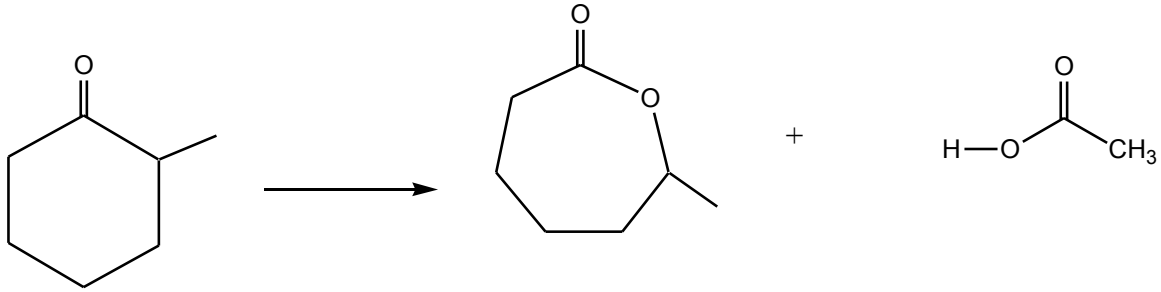
(i)



(ii)



(iii)

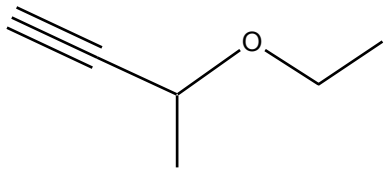


Question TWO

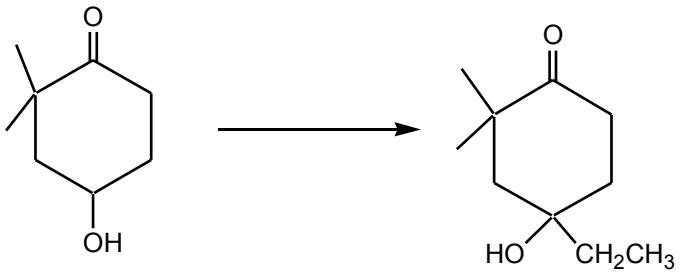
a) Synthesize the following TM (target molecule), starting only with compounds containing 2 carbons or fewer, you may use any commercially available reagents as necessary.

(10marks)

TM:



b) Starting with y, show how you could synthesis Z using retro synthetic analysis and showing cleanly synthetic equate was and the synthesis write up. **(10marks)**

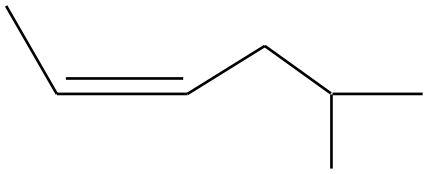


Y Z

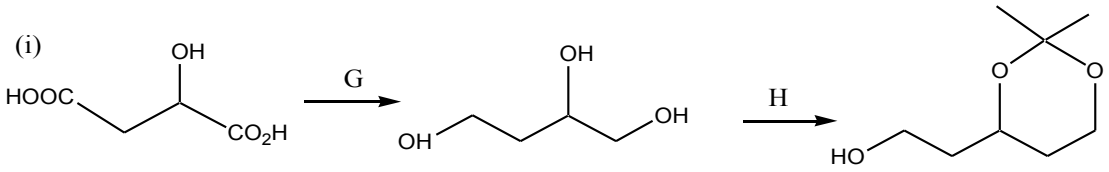
Question THREE

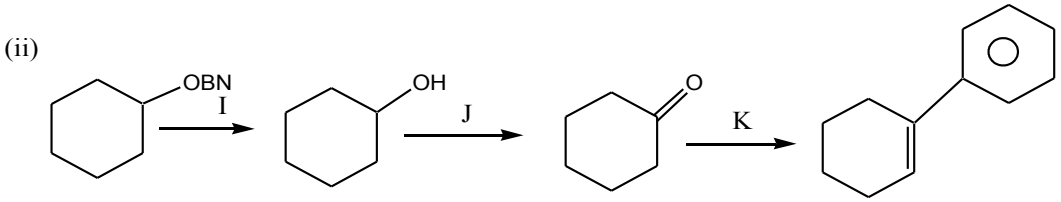
a) Synthesize the following TM. using the witting reaction and starting only with alcohols as the sources of carbon you may use any commercially available reagents as necessary.

(10marks)

TM 

b) Provide the missing reagents G-K in the following reactions



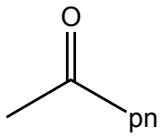


(10marks)

Question FOUR

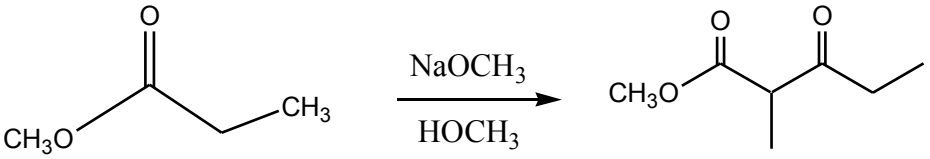
a) Provide TWO possible syntheses for the following TM. 4 each synthesis must involve the formation of a new C-C bond and may use any commercially available reagents.

(10marks)

TM: 

4

b) Consider the reaction below: **(10marks)**

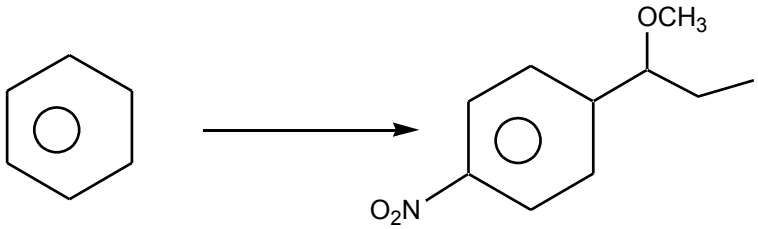
2 

(i) Show the arrow pushing mechanism for the formation of the product

(ii) Name the reaction.

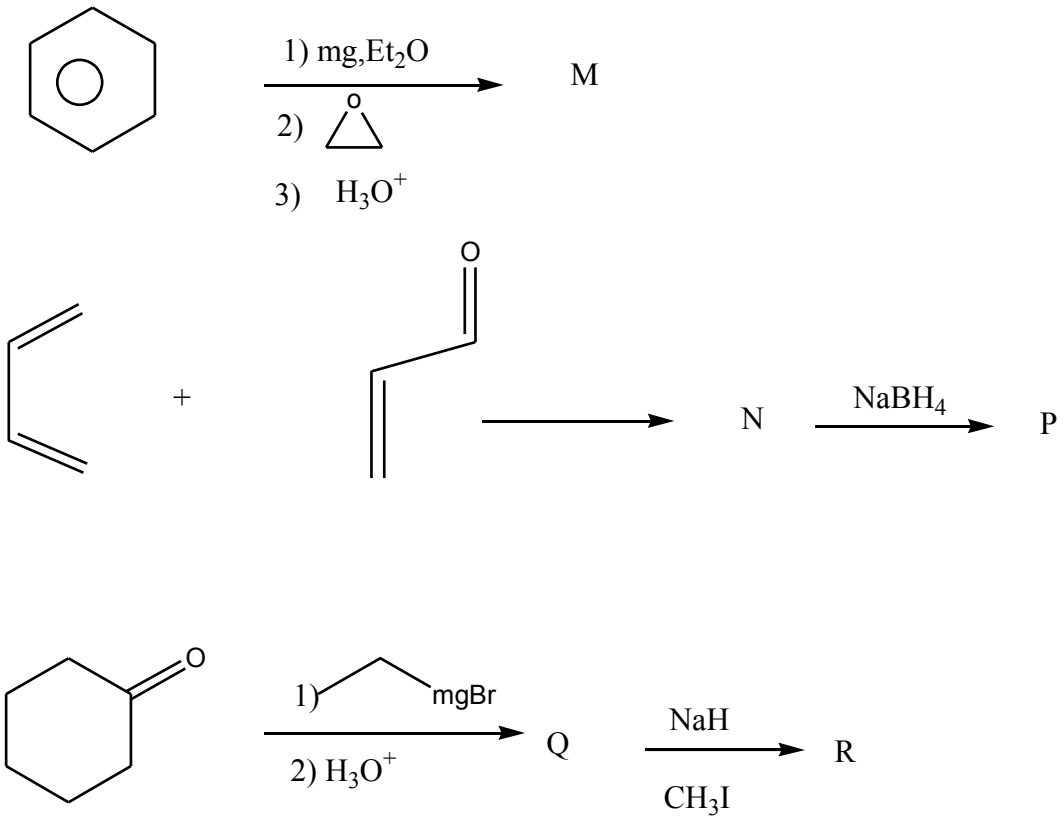
Question FIVE

a) Starting with V, show how you would synthesize V. **(10marks)**



U V

b) Draw the structure of the major products in the following reactions. **(10marks)**


1) mg,Et2O
2)
3) H3O+
M
O
+
O
N
NaBH4
P
O
1)
mgBr
2) H3O+
Q
NaH
CH3I
R