



KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER
SUPPLEMENTARY EXAMINATIONS

FOR THE DEGREE OF BSC (CHEMISTRY)

COURSE CODE: SCH 212^{*}

COURSE TITLE: ORGANIC CHEMISTRY I

DATE: 5/02/21

TIME: 11-1 Pm

INSTRUCTIONS TO CANDIDATES:

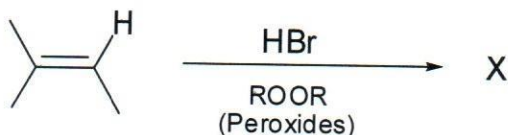
TIME: 2 Hours

Answer question ONE and any TWO of the remaining

KIBU observes ZERO tolerance to examination cheating

QUESTION ONE (30 MARKS)

a) Draw the structure of the product X. Give a reason. (3 marks)



b) Draw the structures of: (2 marks)

c) Draw and label the E and Z isomers of the following compounds (4 marks)



d) Draw the structures of the following compounds. (4 marks)

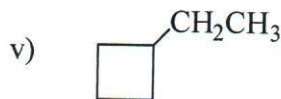
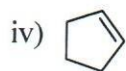
i) 3-methyl-3-heptene

ii) 6-bromo-4-ethyl-2-heptanol

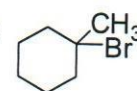
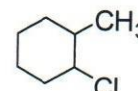
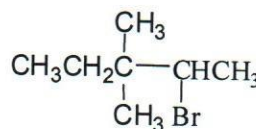
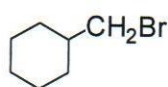
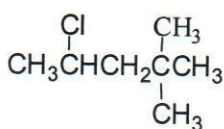
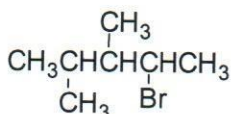
iii) 4-methyl-2-hexyne

iv) 1,3-dimethylcyclohexane

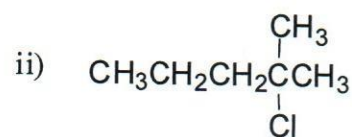
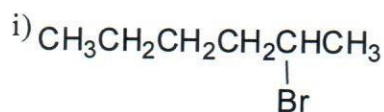
e) Give the systematic (IUPAC) names for each of the following compounds (5 marks)



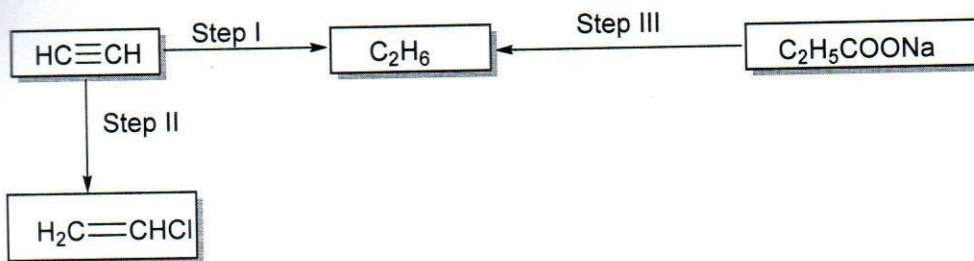
f) Which of the following alkyl halides forms a substitution product in an $\text{S}_\text{N}1$ reaction that is different from the substitution product formed in an $\text{S}_\text{N}2$ reaction? (2 marks)



g) For each of the following alkyl halides, indicate the major product formed when the alkyl halide undergoes an $\text{E}1$ reaction. Show the stereochemistry of the major products. (4 marks)



h) Study the scheme below and answer the questions that follow.



i) Name the reagents in:

(3 marks)

Step I

Step II

Step III

ii) Write an equation for the complete combustion of $\text{HC}\equiv\text{CH}$

(1 mark)

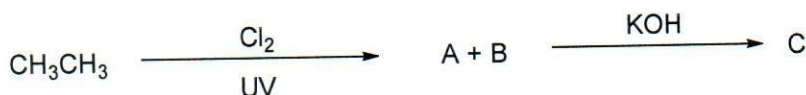
iii) Give two uses of methane

(2 marks)

QUESTION TWO (20 MARKS)

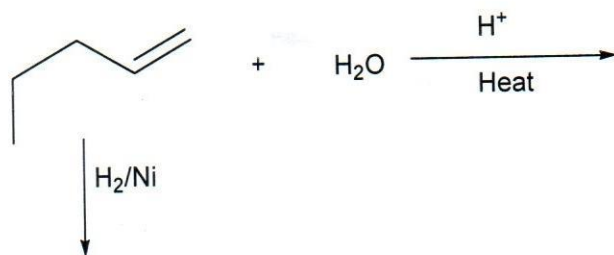
a) Complete the reactions below:

i)



(3 marks)

ii)



(2 marks)

b) Label and show the steps of the monohalogenation reaction leading to products A and B above using curly arrows

(6 marks)

c) Explain the following:

i) 1,3-pentadiene is more stable than 1,4-pentadiene

(2 marks)

ii) Ethers generally have a higher boiling points than alkanes of comparable molecular weight

(2 marks)

iii) Alkanes have lower boiling points than alcohols of comparable molecular weight

(2 marks)

iv) Amines have lower boiling points than alcohols of comparable molecular weight

(2 marks)