RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

Bachelor of Science in Applied Sciences
First Year - Semester II Examination – January / February 2023

CHE 1203 – ORGANIC CHEMISTRY I

Answer ALL questions **Time: Two (2) hours**

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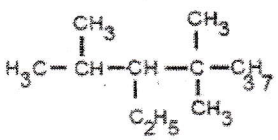
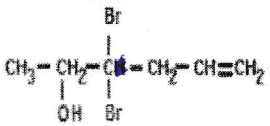
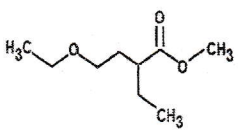
01. (a). Give IUPAC names of the following compounds.



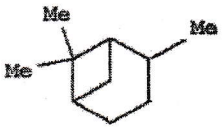
i



ii.



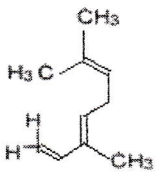
iii.



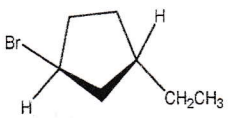
v.

(10 marks)

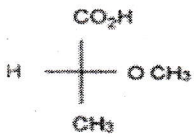
(b). Give IUPAC names of the following compounds with R/S, *cis/trans* or E/Z configurations.



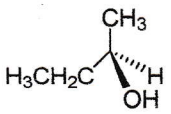
i



ii



iii



iv

(10 marks)

(c). Draw the structure of the following compounds

i. (S)-2-Chloro-4-methylhept-3-ene ii) Bicyclo-(2,2,1)-heptene

(05 marks)

cyclo

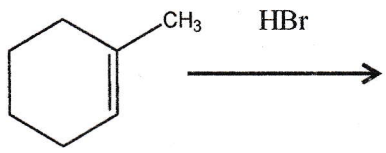
02. (a). Identify A,B,C and give IUPAC names of them

cyclohexene.

(i). ~~Bromo~~clohexene $\xrightarrow[\text{NBS}]{\text{UV, } CCl_4}$ A + B

(03 marks)

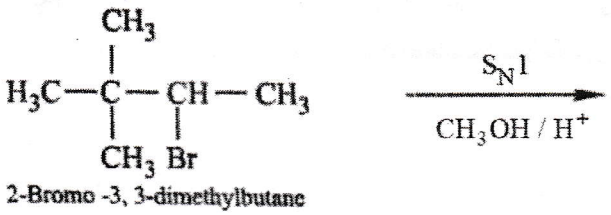
(ii). Write the mechanism of the following reaction in the presence of H_2O_2



C

(03 marks)

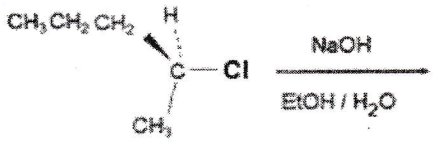
(b). Write the mechanism of the following reaction



2-Bromo -3, 3-dimethylbutane

(06 marks)

(c). The given below is the S_N2 type reaction of (S)-2-Chloropentane with NaOH in ethanol-water.



(S)-2-Chloropentane

i. Briefly discuss the factors that affect the rate of S_N2 type reaction.

(04 marks)

ii. Write all the steps and the mechanism of this reaction and draw the relevant energy diagram.

(05 marks)

iii. Discuss the stereoisomerism of this reaction

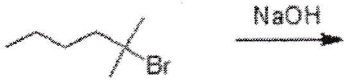
(04 marks)

03. (a). 1-chloro-1-methyl cyclopentane reacts with KOH and ethanol under suitable conditions to give two products. Identify the major and minor products and write the mechanism for the reactions.

(06 marks)

(b). Find the products of the following reactions

(i). 

(ii). 

(04 marks)

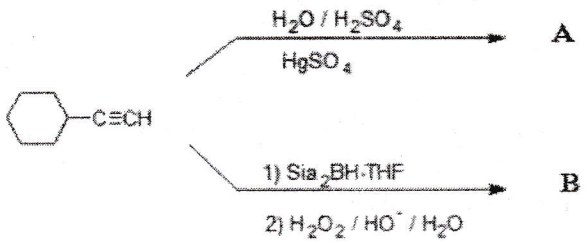
(c). Identify the vicinal dihalide that could be used in the synthesis of:

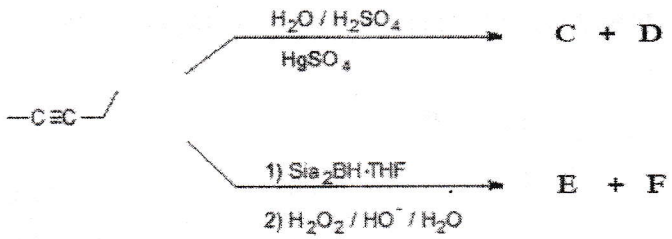
(i). 2,2,5,5-Tetramethyl-3-hexyne.

(ii). 4-Methyl-2-hexyne.

(06 marks)

(d). Identify A, B, C, D and E in the following reactions

(i). 

(ii). 

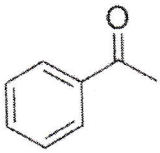
(09 marks)

04. (a). Describe all steps of the McLafferty rearrangement of 2-hexanone.

(05 marks)

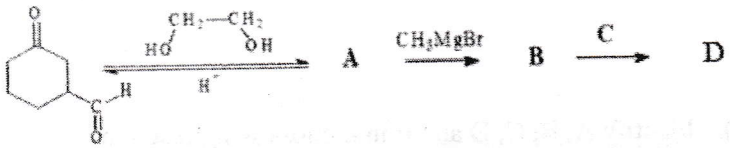
(b). Elaborate on the Wolff-Kishner reduction mechanism of acetophenone

(05 marks)



acetophenone

(c). Identify the intermediates and reagents, and complete the following reactions.

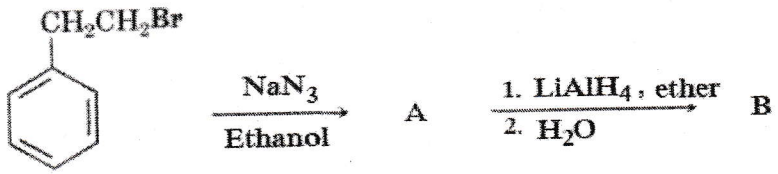


(05 marks)

(d). In electrophilic aromatic substitution reactions, -OH activates the benzene ring and directs substitution towards to ortho / para position". Explain this statement by giving detailed mechanisms.

(06 marks)

(e). Identify A and B and complete the following reactions.



1-Bromo-2-phenylethane

(04 marks)

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