RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences

First Year Semester II Examination February - March 2019

CHE 1203 – ORGANIC CHEMISTRY I

Time: 02 hours

Answer any four questions.

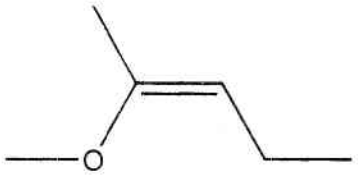
01. (a). Draw the relevant structures for given IUPAC names.

i) 3-Chloro-4-ethyl-6-nonene
ii) 2,3,5-trimethyl-4-propylheptane
iii) Bicycle-(2,2,1)-heptene
iv) ethyl-3-hydroxyhexaneoate

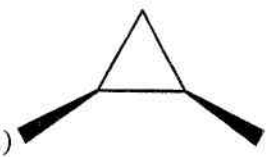
(10 marks)

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

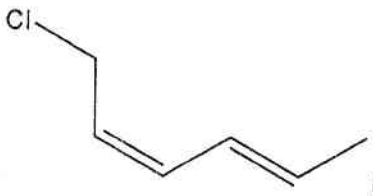
i)



ii)



iii)



iv)

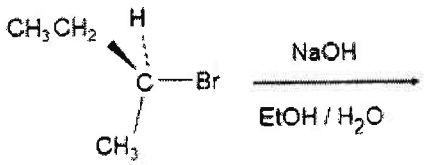
(12 marks)

(c). Draw the structure of the compound (R)-2-chloro-4-methylhept-3-ene

(03 marks)

02. (a). Compare the two mechanisms of nucleophilic substitution reaction. (06 marks)

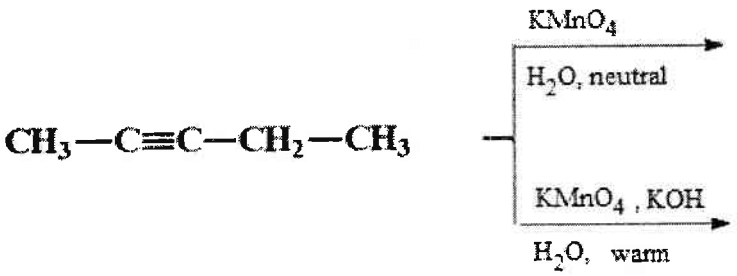
(b). Identify the intermediate and the final product, and discuss the stereoisomerism of the following reaction proceeds with S_N2 mechanism. (07 marks)



(S)-(+)-2-Bromobutane

(c). Compare and contrast S_N1 and E_1 reaction mechanisms. (06 marks)

(d). Identify the products and complete the following reactions. (06 marks)



03. (a). Identify the products and complete the following reactions. (08 marks)

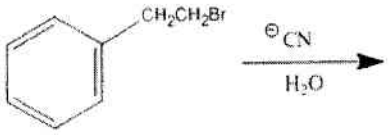
i. 

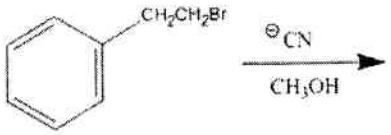
ii. 

iii. 

(b). Complete the following equations and compare the rates of reaction with each other.

(07 marks)

i. 

ii. 

(c). Write all the steps and give the mechanism for the reaction given belw. Draw the relevant energy diagram.

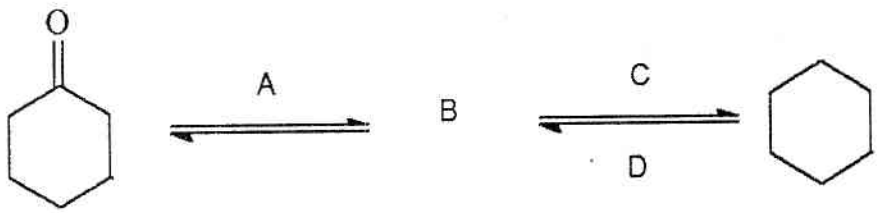
(10 marks)

$$(CH_2CH_3)_3CBr + OH^- \longrightarrow (CH_2CH_3)_3OH + Br^-$$

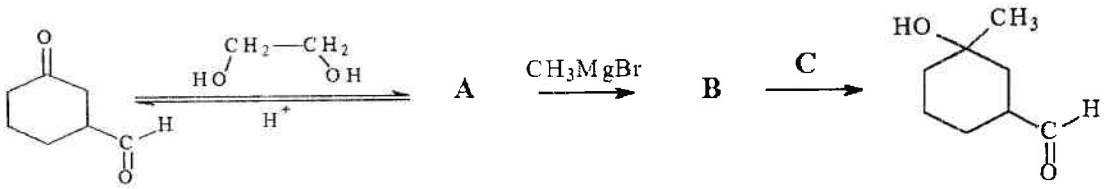
04. (a). Describe all steps of the McLafferty rearrangement of pentanal. (06 marks)

(b). Outline the steps in synthesis of 1-propanal from propyne using Disiamylborane in the initial step. (06 marks)

(c). Describe the steps of Wolff-Kishner reduction in the following reations. (06 marks)



(d). Identify the intermediates and reagents, and complete the following reactions. (07 marks)

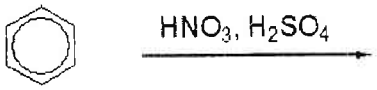


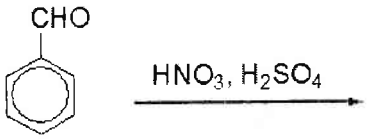
05. (a). "-NO_2 deactivates the benzene ring towards electrophilic aromatic substitution reactions and directs substitution to the meta- position". Explain this statement.

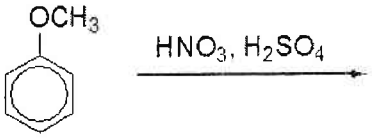
(07 marks)

(b). Discuss the products and comment the relative rates of the following reactions.

(06 marks)

i 

ii 

iii 

(c). Reaction of NH_3 with CH_3OH in the presence of alumina catalyst produces a mixture of methylated amines. Outline the complete steps of the reaction.

(06 marks)

(d). Describe the sysnthesis of benzaldehyde using Gatterman-Koch reaction.

(06 marks)

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