RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree

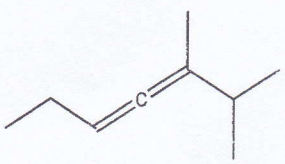
First Year Semester II Examination October – November 2017

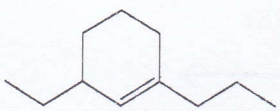
CHE 1203 – ORGANIC CHEMISTRY I

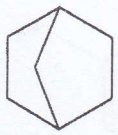
Answer any four questions. Time: 02 hours

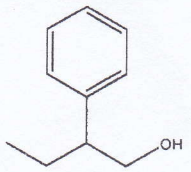
01.

(a). Give IUPAC names of the following compounds

i). 

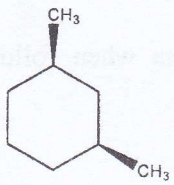
ii). 

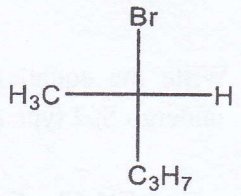
iii). 

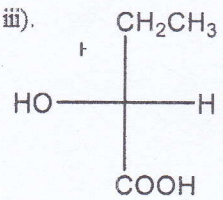
iv). 

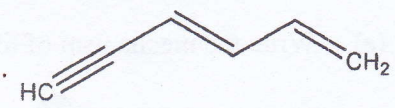
(10 marks)

(b). Give IUPAC names of 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 (2E, 4Z)-1-bromo-2,4-hexadiene. (03 marks)

02.

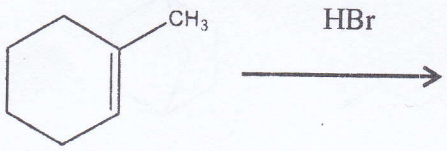
(a) Identify A,B,C and give IUPAC names of them

i). A $\xrightarrow{PBr_3 / \text{ether}}$ 2-bromo-2-methy lbutane

ii). Cyclohexene $\xrightarrow[NBS]{UV,\ CCl_4}$ B + C

(04 marks)

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



(05 marks)

(c). Briefly discuss the factors effect on the rate of S_N1 type reaction

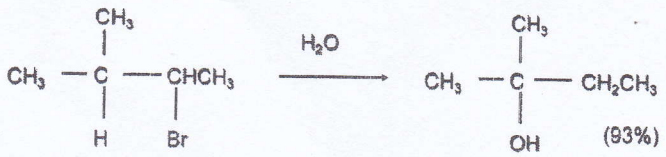
(05 marks)

(d). Write the equations and compare the rate of reactions when following compounds undergo S_N2 type reaction with HCN.

CH_3Cl, C_2H_5Cl, $CH_3CH(CH_3)Cl$, $(CH_3)_3CCl$

(06 marks)

(e). Write the mechanism of following reaction



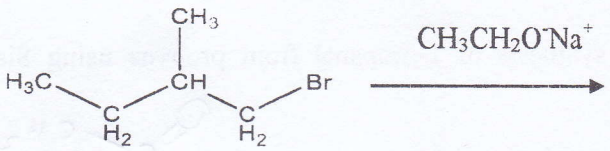
(05 marks)

03.

(a) Write a short note on characteristics of the E_1 and E_2 reactions

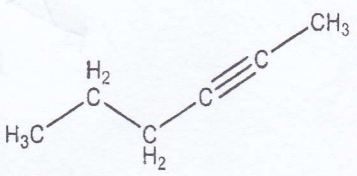
(07 marks)

(b) Identify the products, write the mechanism and discuss the following elimination reaction according to the Zaitsev`s Rule. (07 marks)

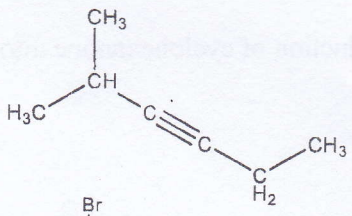


(c) Identify the products and complete following reactions

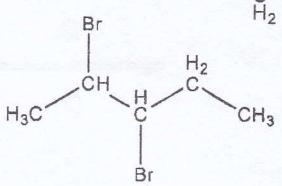
i).



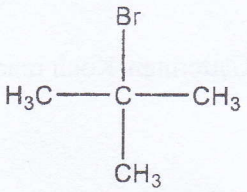
ii).



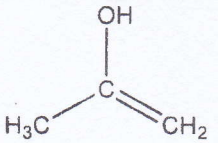
iii).



iv).



v).



(11 marks)

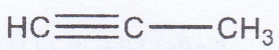
04.

(a). Describe the oxidation reaction of 2- hexyne under following two conditions

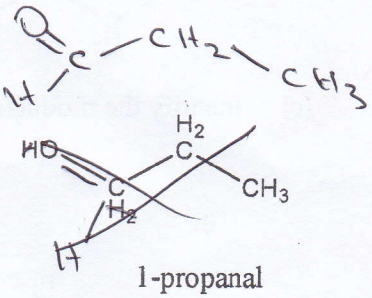
i) $KMnO_4 / H_2O$ / Neutral
ii) $KMnO_4 / KOH / H_2O$ / warm

(06 marks)

(b). Outline all steps in the synthesis of 1-propanal from propyne using Sia_2BH (Disiamyl borane) in the initial step.



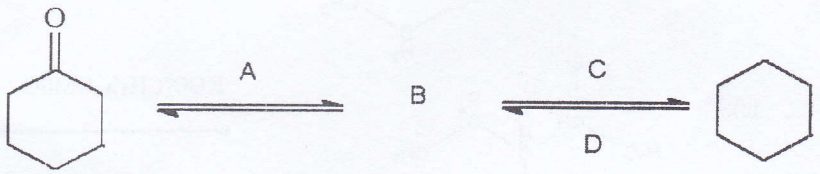
Propyne



1-propanal

(05 marks)

(c). Describe the steps of Wolff-Kishner reduction of cyclohexanone into cyclohexane.



(04 marks)

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

(05 marks)

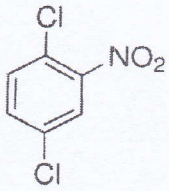
(e). Give a method to identify the presence of aldehyde in a given mixture of compounds and, mention the relevant chemical reaction/s

(05 marks)

05.

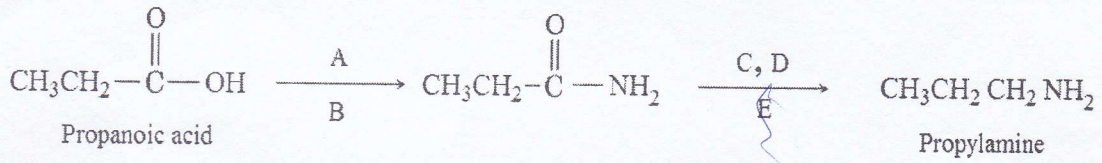
(a). Discuss the synthesis of mixture of 1,4-Dichloro-2- nitrobenzene and 1,2- Dichloro – 4 - nitrobenzene from benzene

(08 marks)



1,4-Dichloro-2- nitrobenzene

(b). Propanoic acid can be used to synthesis of propyl amine. Identify A, B, C, D and E, and outline the complete equation of the reaction.

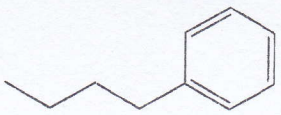


Propanoic acid

Propylamine

(05 marks)

(c). How to prepare 1-phenylbutane from benzene in two steps

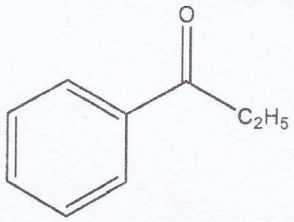


1-phenylbutane

(05 marks)

(d). Write the chemical reaction taking place when following compound undergoes Clemmensen reduction

(07 marks)



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