RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree in Applied Sciences

First Year Semester II Examination– April / May 2015

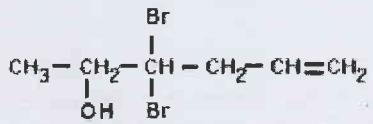
CHE 1203 – ORGANIC CHEMISTRY I

Answer any **FOUR** questions. Time: 02 hours

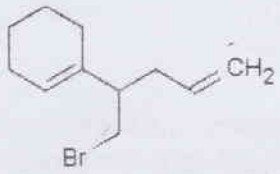
01.

(a). Give IUPAC names of the following compounds

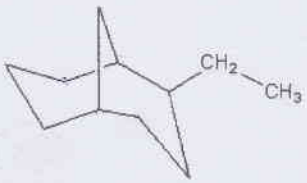
i).



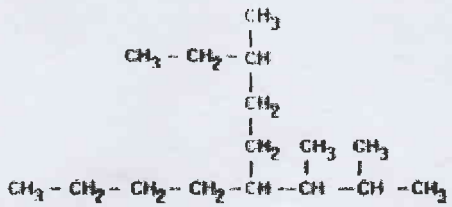
ii).



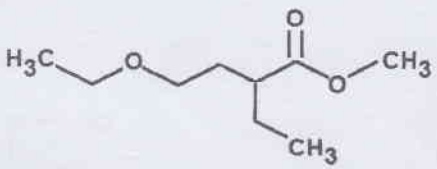
iii).



iv).



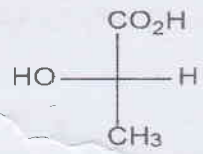
v).



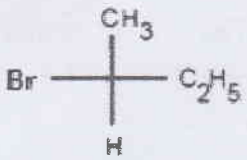
(10 marks)

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

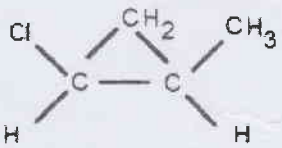
i).



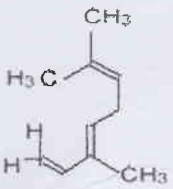
ii).



iii).



iv).



(12 marks)

(c). Draw the structure of the compound (Z, Z)-3,5-Octadienal.

(03marks)

02.

(a). Identify the products and complete the following reactions

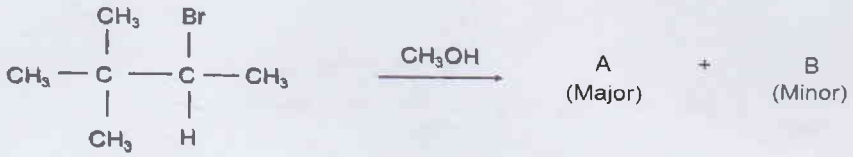
i. 

ii. 

iii. 

(08 marks)

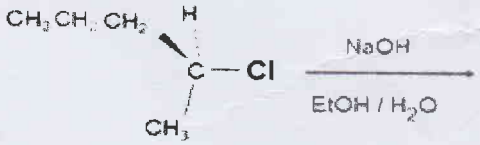
(b). Less stable carbocations rearrange into more stable forms during nucleophilic subtitution type 1 reactions. Identify the prodcts, write the mechanism and discuss the above sentence using following reaction.



2-Bromo-3,3- dimethyl butane

(08 marks)

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



(S)-2-Chloropentane

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

(05 marks)

ii. Discuss the stereoisomerism of this reaction

(04 marks)

03.

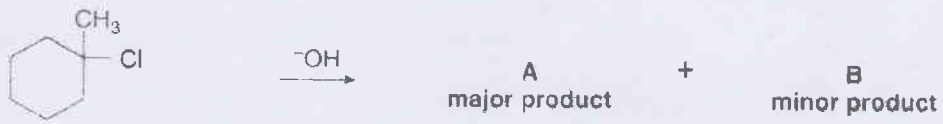
(a). Write a short note about the similarities of S_N2 and E2 reactions

(05marks)

(b). In an elimination reaction, products, *trans*-2-Pentene is more stable than *cis*-2-Pentene, but both are more stable than 1-Pentene. Expalin the statement.

(06 marks)

(c). Identify the products A and B, write the michanism and discuss the following elimination reaction according to the Zaitsev's Rule.

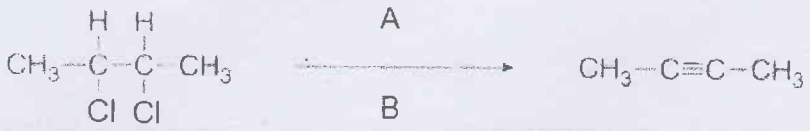


1-chloro-1-methylcyclohexane

(08 marks)

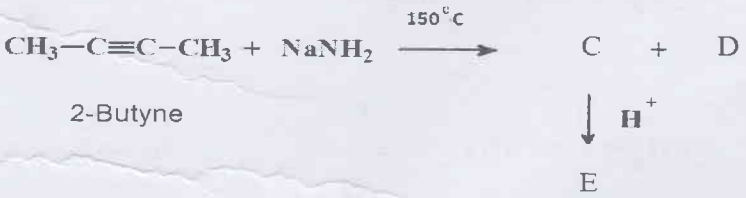
(d). Identify the products and complete following reactions

i.



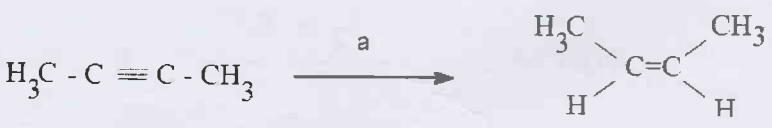
2,3 dichloro butane

ii.



2-Butyne

iii.



2-butyne

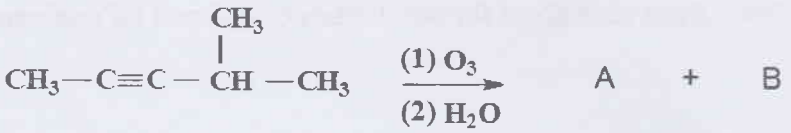
cis-2-butene

(06 marks)

04.

(a). Identify A, B and C and complete the following reactions

(i)



(ii)

(08 marks)

(b). Outline all steps of McLafferty rearrangement of Butanal.

(06 marks)

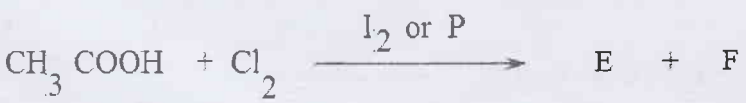
(c). Describe the steps of Wolff-Kishner reduction of cyclohexanone into cyclohexane.

(05 marks)

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

i. 

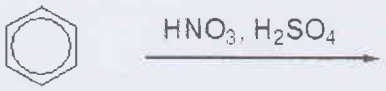
ii. 

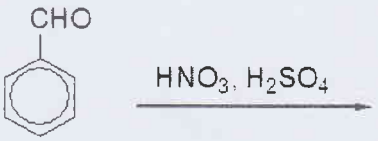
iii. 

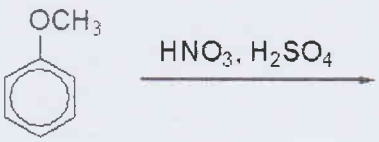
(06 marks)

05.

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

i 

ii 

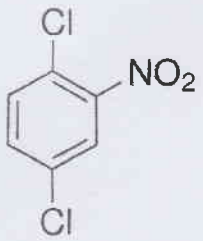
iii 

(06 marks)

(b). " $-CH_3$ activates the benzene ring towards the electrophilic aromatic substitution reactions and directs substitution to the ortho-para position" , explain the above sentence using a suitable example. Write the relevant mechanism.

(09 marks)

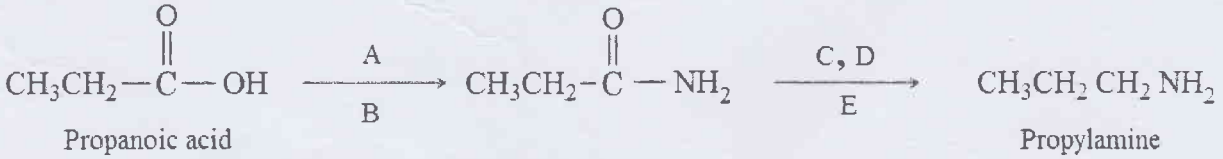
(c). Discuss the synthesis of mixture of 1,4-Dichloro-2- nitrobenzene and 1,2-Dichloro-4-nitrobenzene from benzene



1,4-Dichloro-2- nitrobenzene

(05 marks)

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



Propanoic acid Propylamine

(05 marks)

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