Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2015/2016

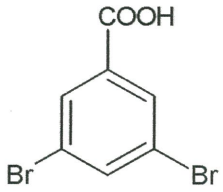
COURSE NAME	:	ORGANIC CHEMISTRY
COURSE CODE	:	DAS 22503
PROGRAMME	:	2 DAU
EXAMINATION DATE	:	DECEMBER 2015/JANUARY 2016
DURATION	:	2½ HOURS
INSTRUCTION	:	**SECTION A** : ANSWER **ALL** QUESTIONS **SECTION B** : ANSWER **TWO (2)** QUESTION ONLY

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

SECTION A

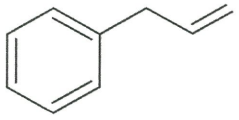
Q1 (a) Write names for the following compounds.

(i)



(1 mark)

(ii)



(1 mark)

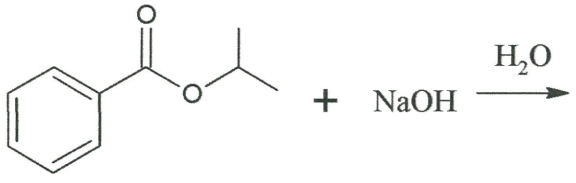
(b) Write structural formulae of all structural isomers of benzene compounds (C_8H_{10}) and name the isomers.

(8 marks)

(c) Draw a detailed mechanism for the chlorination of benzene using Cl_2 and $FeCl_3$.

(15 marks)

Q2 (a) Complete and write a balanced equation for the hydrolysis of each ester in aqueous sodium hydroxide, showing all products as they are ionized in aqueous NaOH.



(15 marks)

(b) Give **two (2)** functional groups present in amino acids and draw general structure of α-amino acid.

(4 marks)

(c) Although the beneficial effects of many organic halides are undisputed, certain synthetic chlorinated organic such as *chlorofluorocarbons,* CFCs and pesticide *dichlorodiphenyltrichloroethane,* DDT have caused lasting harm to the environment. Explain these organic halides complete with their molecular structure.

(6 marks)

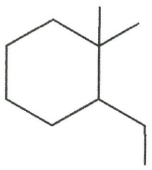
SECTION B

Q3 (a) Classify the designated carbon atoms.

(i)

(3 marks)

(ii)



(4 marks)

(b) The following are the structural formulas for chemical compounds. Give IUPAC name for each compound and divide each name into a prefix, an infix and a suffix. Explain your answer.

(i) $CH_2{=}CHCH_3$

(2 marks)

(ii) CH_3CH_2OH

(2 marks)

(iii)

(2 marks)

(c) Draw and name the structures for all possible isomers of $C_5H_{11}Cl$.

(12 marks)

Q4 (a) (i) Define *Cis – Trans* isomerism in cycloalkanes.

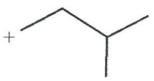
(4 marks)

(ii) Draw skeletal structure of decane, butane and hexane. Arrange the alkanes in order of increasing boiling point. Explain your answer.

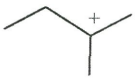
(5 marks)

(b) Classify each carbocation and for (i), (ii) and (iii), rank in order of increasing stability.

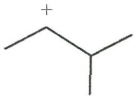
(i)



(ii)

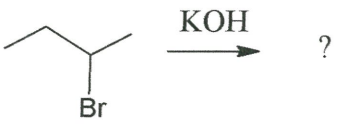


(iii)



(4 marks)

(c)



Draw the mechanism of this reaction. Identify the most stable product. Explain your answer.

(12 marks)

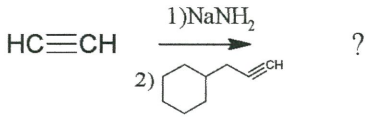
Q5 (a) Draw the mechanism and name all the constitutional isomers formed by monohalogenation of $(CH_3)_2CHCH_2CH_3$ with Cl_2 and *hv*.
Predict the major product.

(10 marks)

(b) Name and draw the structural formulas for the two possible products of 1-methylcyclopentene addition reaction with hydrochloric acid (HCl). Use Markovnikov's rule to predict the major product.

(10 marks)

(c) Propose a mechanism for this alkylation reaction



(5 marks)

-END OF QUESTION-