TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN ANALYTICAL CHEMISTRY

DAC 15S

ACH 2107: ORGANIC CHEMISTRY I

END OF SEMESTER EXAMINATION

SERIES:APRIL2016

TIME:2HOURS

DATE: Pick DateSelect MonthPick Year

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attemptquestion ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

(a) Explain three important properties of carbon that enable it to form many stable compounds (9marks).

(b i) Define double bond equivalent (DBE). (2marks).

(ii) Calculate DBE of a compound with the following molecular formulae .$C_{16}H_{18}N_2O_4CL_2$. (4marks).

(c) Using hybridization predict the shapes of the following molecules.

CH4, BF3, and BeCl2, (9marks).

(d) Write and name structural isomers of a compound with the following molecular formulae.

C_5H_{12} (6marks)

Question TWO

(a) Explain
(i) how sigma-bond and pi- bonds are formed. (4marks)
(ii) Why Alkanes don't react with ions or polar molecules . (5marks)
(b) Differentiate between homolytic fusion and heterolytic fusion. (6marks)

Question THREE

(a) List three types of intermolecular forces of attraction. (3marks).
(b) (i) Draw and name cis and trans isomers of $C_2H_2Br_2$. (2marks)
(ii) with reason classify them as polar and non polar. (4marks)
(c) Explain three factors that influences electronegativity. (6marks)

Question FOUR

(a) Explain why Crystals of un hydrous $CaSO_4$ are very hard and very difficult to cleave while crystals of $CaSO_4.2H_2O$ are soft and easy to cleave. (5marks)
(b) State two conditions for Hydrogen-bond formation. (2marks)
(c) (i) Draw structures of 1-butyne and 2-butyne molecules. (2marks)
(ii) How you would distinguish between the above two organic compounds in the Laboratory. (6marks)

Question FIVE

(a) Cracking is a reaction that is carried out in alkanes.
(i) How is cracking of alkanes done. (4marks)
(ii) Discuss TWO important uses of cracking of alkanes in petrochemical industries.(4marks)
(b) Define the following terms.
(i) Enantiomer. (2marks)
(ii) Racemic mixture. (2marks)
(iii) Free radical. (2marks)
(iv) isomer. (1mark)