



TECHNICAL UNIVERSITY OF MOMBASA
FACULTY OF APPLIED AND HEALTH SCIENCES
DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN ANALYTICAL CHEMISTRY

ACH2205 : ORGANIC CHEMISTRY II

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: Pick Date Select Month Pick 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. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- (a) Name the following amines and classify the as 1° , 2° or 3° amines
(i) $\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$. (ii) $(\text{CH}_3\text{CH}_2\text{CH}_2)_2\text{NH}$. (iii) $(\text{CH}_3\text{CH}_2\text{CH}_2)_3\text{N}$. (4.5marks)
- (b) Write equation for reaction of the above amines with HCl and name the products. (4.5marks)
- (c) Explain the effect of carbonyl group on solubility of carboxylic acids. (5marks)
- (d) Name and draw the product of oxidation of the following alcohols.
(i) $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$, (ii) $\text{CH}_3\text{CHOHCH}_3$ (5marks)
- (e) (i) 2-methyl propan-2-ol alcohol does not get oxidized by any oxidizing agent. Explain. (3marks)
(ii) List TWO suitable oxidizing reagents for the above reactions. (3marks)
- (f) (i) Arrange the following C-Hal bond in order of increasing bond strength.
C-Br, C-I, C-F and C-Cl. (2marks)

(ii) C-F bond is the most stable of the above bonds. Explain. (3marks)

Question TWO

(a)(i) State FOUR physical properties of alkyl halides. (8marks)

(ii) Acyl halides undergo nucleophilic substitution reactions more readily than alkyl halides. Explain. (4marks)

(b) Write an equation of a reaction between $\text{CH}_3\text{CH}_2\text{COCl}$ and NH_3 and name the main product. (2marks)

(c) Giving TWO examples, define a nucleophile. (1marks)

Question THREE

(a) Name and draw two isomeric structures of a compound with $\text{C}_3\text{H}_6\text{O}$ molecular formulae. (4marks)

(b) (i) Name and write the formulae of the alcohols that would be oxidized to give the above isomeric structures. (4marks)

(ii) Give TWO examples of suitable oxidizing reagents that can be used in the above reaction. (2marks)

(c) Naming the main products, write equations for reaction between $\text{CH}_3\text{CH}_2\text{COOH}$ and the following reagents. (i) H_2O . (ii) NaOH . (4marks)

(d) (i) Define the term "dehydration". And give an example of dehydrating reagent. (1mark)

Question FOUR

(a) (i) State Saytzeff rule. (2marks)

(ii) Name and write the structural formulae of major product of dehydration of butan-2-ol by concentrated H_2SO_4 acid. (2marks)

(b) (i) Explain the variation in boiling points of the following compounds.

CH_3CH_3 -84°C , CH_3NH_2 -7°C , and CH_3OH 65°C (4marks)

(ii) With a reason arrange the above compounds in decreasing order of solubility in water. (6marks)

(c) Write an equation for reaction of CH_3NH_2 with water and name the major product (1mark)

Question FIVE

(a) Oximes are prepared by condensation reaction between an aldehyde and NH_2X compounds.

(x is NH_2 , or OH).Using $\text{CH}_3\text{CH}_2\text{CHO}$ and NH_2OH including arrows, write equation for formation of

oximine .

(6marks)

(b) (i) State the bases of Cannizzora reaction.

(5marks)

(ii) Write an equation for reaction of methanol and sodium hydroxide and name products.

(4marks)