TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE FOOD TECHNOLOGY AND QUALITY ASSURANCE AND BACHELOR OF SCIENCE ENVIRONMENTAL PUBLIC HEALTH

ABT 4201: BIOCHEMISTRY 1.

END OF SEMESTER EXAMINATION

SERIES:APRIL2016

TIME:2 HOURS

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) State the functions of the following cell organelles (3mrks)

i. Mitochondria

ii. Lysosome

iii. Nucleus

b) Differentiate nucleotide and nucleoside (2mrks)

c) Define the following terminologies (3mrks)

i. Prosthetic group

ii. Haloenzymes

iii. Apoenzyme

d) List the properties of monosaccharides (5mrks)

e) Draw the structures of the following molecules (3mrks)

i. D-glucose

ii. D-galactose

iii. D-fructose

f) Outline the distinguishing features between the monosaccharides in above (4mrks)

g) The following data was obtained after titration of glycine was carried out

Pk_1=2.34 and pk_2= 9.6

i. Define isoelectric point of an amino acid (2mrks)

ii. Calculate the PI of glycine (2mrks)

h) Draw structures of the fatty acids represented by short hand notation below and give their systematic and common names

i. 18:2($\Delta^{9,12}$)

ii. 16:0 (6mrks)

Question TWO

Discuss the factors that affect enzyme catalyzed reactions (20mrks

Question THREE

Describe the following mechanisms as used to explain enzyme catalysis:-

i. General acid-base catalysis (7mrks)
ii. Covalent catalysis (7mrks)
iii. Metal ion catalysis (6mrks)

Question FOUR

I. Discuss the structure and state the functions of starch and glycogen (12mrks)

II. Compare and contrast the structural differences between glycogen and cellulose (8mks)

Question FIVE

(i) Platelet-activating factor is an ether lipid that plays an important role in molecular signaling.

a) Draw the structure of platelet-activating factor (5mrks)

b) Give two other functions of this lipid (2mrks)

c) Give another example of ether lipid (1mk)

(ii) Indicate in the blank provided the match between the molecules and their biological roles (4mrks)

a) Peptidoglycan ----------homopolysaccharide of glucose in animals

b) Starch ----------homopolysaccharide glucose in plants

c) Chitin----------exoskeleton of lobsters

d) Glycogen----------structural component of bacterial cell walls

(iii) Briefly discuss the structure of keratin and collagen (10mrks)