



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: APRIL 2016

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. Attempt question 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)
- Mitochondria
 - Lysosome
 - Nucleus
- b) Differentiate nucleotide and nucleoside (2mrks)
- c) Define the following terminologies (3mrks)
- Prosthetic group
 - Holoenzymes
 - Apoenzyme
- d) List the properties of monosaccharides (5mrks)
- e) Draw the structures of the following molecules (3mrks)
- D-glucose
 - D-galactose
 - 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)