



MACHAKOS UNIVERSITY

University Examinations 2018/2019

SCHOOL OF PURE AND APPLIED SCIENCES

DEPARTMENT OF BIOLOGICAL SCIENCES

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN POPULATION HEALTH

HPH 104 BIOCHEMISTRY

DATE: 29/7/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer all the questions in section A

Answer any two questions in section B

SECTION A

QUESTION ONE

- Describe key characteristics of amino acids (3 marks)
- Describe three chemical mechanisms in macromolecules formation (3 Marks)
- Using glyceraldehyde as an example define an enantiomer (3 marks)
- Outline SIX functional features of fatty acids (3 marks)
- Outline three common reactions encountered in biochemical processes (3 Marks)
- Briefly describe THREE Structural representation of sugars (3 marks)
- Describe Watson and Crick Model of DNA (3 marks)
- Describe the structure of any three aliphatic amino acids (3 marks)
- Evaluate the reactional features of the polymerization of amino ($-\text{NH}_3^+$) and carboxyl ($-\text{COO}^-$) groups of amino acids. (3 marks)
- Describe six functional characteristics of proteins (3 marks)

QUESTION TWO

- Using examples discuss stereoisomerism of monosaccharides (10 Marks)
- Discuss tertiary and quaternary protein structures (10 Marks)

QUESTION THREE.

Discuss the structural and functional features of FIVE polysaccharides (20 Marks)

QUESTION FOUR

Discuss the mechanisms of enzymatic regulation (20 marks)

QUESTION FIVE

Derive the Michael-Menten equation and its importance in enzymatic catalysis (20 Marks)