TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

MASTERS OF SCIENCE IN BIOTECHNOLOGY

ACH 5123: BIOCHEMISTRY AND BIOCHEMICAL TECHNIQUES

SPECIAL/ SUPPLEMENTARY EXAMINATIONS

SERIES: SEPTEMBER 2018

TIME: 3HOURS

DATE: Pick DateSep2018

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **SIX** questions. AttemptChoose instruction.

Do not write on the question paper.

Question ONE

i. Explain the principle of centrifugation. (10 marks)

ii. List five applications of ultracentrifuges. (5 marks)

iii. Discuss the significance and limitations of radioisotope labeling. (10 marks)

Question TWO

i. Explain the process of protein ionization using laser desorption mode and Matrix-assisted laser desorption ionization (MALDI) of sample ionization (15 marks)

ii. Describe the process of protein purification using affinity chromatography (10 marks)

Question THREE

i. Describe the principle behind X-ray crystallography (5 marks)

ii. Using a diagram describe any two methods of sample crystallization (10 marks)

iii. Describe sample analysis by X-ray crystallography (10 marks)

Question FOUR

i. Give a detailed account of protein analysis using NMR spectroscopy. (15 marks)

ii. Using a diagram illustrate the basic components of NMR spectroscopy (10 marks)

Question FIVE

i. List the chromatographic figure of merit (3 marks)

ii. Discuss general elution problem chromatography and explain how it can be solved. (15 marks)

iii. Explain how proteins can be separated using SDS-PAGE (7 marks)

Question Six

i. Explain the principle involved in the separation of biomolecules using gel filtration chromatography (10 marks)

ii. Outline the applications of gel filtration chromatography. (3 marks)

iii. Describe Enzyme Assay and methods used in measurements of enzyme activity. (12 marks)