



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATION FOR:

MASTERS IN CHEMISTRY (MSC 16S)

ACH 5102: ADVANCED ANALYTICAL CHEMISTRY

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 3 HOURS

DATE: 6 Feb 2017

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **SIX** Question(s). Attempt any **FOUR** questions.

Do not write on the question paper.

Question ONE

- (a) What is Analytical chemistry? (4 marks)
- (b) Write notes on the classification of analytical methods (10 marks)
- (c) Describe the advantages and Limitations of Instrumental methods (11 marks)

Question TWO

Write succinct notes on:

- (a) Solving Single crystal structures from X-Ray diffraction data. (10 marks)
- (b) Advantages of Neutron diffraction over X-Ray diffraction (7 marks)
- (c) Neutron diffraction and Magnetic properties (8 marks)

Question THREE

- (a) What is Atomic emission spectroscopy? (5 marks)
- (b) Write succinct notes on (i) Advantages ; ii) (Disadvantages, of Emission spectroscopy over other analytical techniques (20 marks)

Question FOUR

Annotate the attached diagram of Absorption, Fluorescence and Phosphorescence and write notes on the processes therein (25 marks)

Question FIVE

For a Modern Pulsed Fourier Transform NMR describe its components their functions (25 marks)

Question SIX

- (a) What is 2D-NMR? (5 marks)
- (b) With the aid of the attached diagrams discuss: (i) the COSY spectra and ; (ii) the HECTOR Spectra of ethyl 2-butenate. (10x2 marks)