

**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2015/2016**

**YEAR II SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR**

**SCH 2334: COMPUTERS IN CHEMISTRY**

**DATE:DECEMBER 2015 TIME: 2 HOURS**

**INSRUCTIONS:** Answer question one(compulsory) and any other two questions.

QUESTION ONE

a.

i Give an application to a computer in a laboratory.

ii. Distinguish between volatile and non volatile memory of computers.

iii. List four characteristics of memory devices.

iv. Give two functions of the micro processer in a computer. (8 marks)

b.

i. Distinguish a bit from a byte

ii. Using high and low bytes of 8 bits, represent the decimal number 301.

iii. Write a flow chart for a program in BASIC language for calculation of absorbance from percentage transmittance given absorbance =log10(100/Transmittance) (6 marks)

c.

i. Give three goals of instrumental automation.

ii. Give three methods through which data can be transferred into a laboratory information management system. (6 marks)

d.

i. What are the basic functions of a chromatography software

ii. Explain the various statistical evaluations that may be performed to assess repeatability and reproducibility performance of a quality control laboratory. (10 marks)

QUESTION TWO

a.

i. Briefly explain three factors to consider when planning for automation.

ii. Give four properties that a process must posses for it to be automatically controlled.

iii. What are the benefits associated with laboratory automation. (11 marks)

b.

i. What is a chemical database

ii. Give reasons that are roused for and against the use of data bases. (6 marks)

c. Give the basic requirements that a laboratory information system should be able to undertake. (3 marks)

QUESTION THREE

a

i. Give explanations of each of the following terms used in interfacing.

 -Parity

 -bits as flags

 -configuring pins. (8 marks)

b. A 14 bit analogue to digital converter accepts 0-15 volts.

 i. Distinguish an analogue to—digital converter from a digital to analogue converter.

 ii. What resolution is possible with the 14-bit ADC given above. (6 marks)

c Give the explanation of each of the following tools in authoring multimedia material for science presentation.

 -Video

 -Audio

 -Animation (6 marks)

QUESTION FOUR

a.

i. What is an interface

ii. Using an appropriate sketch of interface unit architecture, briefly explain the interrelationship of the address, data and control busses in an interface. (6 marks)

b.

i. Give three ways in which the computer and 1/0 device may communicate.

ii. List six different requirements of 1/0 devices that must be considered during interfacing. (6 marks)

c.

i. Distinguish between bit serial from parallel transmission of data.

ii. Briefly describe the RS232 serial link used in interfacing. (8 marks)