THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Applied & Health Sciences

DEPARTMENT OF PURE & APPLIED SCIENCES

UNIVERSITY EXAMINATIONS FOR BACHELOR OF
TECHNOLOGY IN APPLIED CHEMISTRY (ANALYTICAL & INDUSTRIAL)

ACH 4312 : COMPUTERS FOR CHEMISTRY

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer booklet*

This paper consists of **FIVE** questions in **TWO** sections **A & B**
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

SECTION A (Compulsory – 30 marks)

Question 1:

a) Define the following terms in the context of computer fundamentals:

    i.   Computer

    ii.   Hardware

    iii.   Software   (3 marks)

      iv.

b) Using a well-labeled diagram describe 'Data processing model' in a computer system   (4 marks)

    i.

c) Distinguish between packet switching and message switching in data communication. (4 marks)

d) 'Man developed computers so that he could perform intricate operations such as calculation and data processing. Today, computers are everywhere –in our offices, homes, appliances, automobiles –the list is endless. Much of the world runs on computers and supportive networks, and this has profoundly changed our lives, mostly for the better.'

   i. Briefly discuss at least **FIVE** core characteristics of computers, which make them an essential part of every emerging technology and such a desirable tool in human development. (10 marks)

    ii.

e) Briefly describe **THREE** benefits of networking computers in an organisation. (6 marks)

  i.

f) Briefly describe any **THREE** ways of effectively controlling computer viruses. (3 marks)

   i.

   ii. SECTION B (Attempt any TWO Questions)

   iii. Question 2

   iv. ChemDraw, ACD/ChemSketch, and other computerized tools are designed to aid professional scientists and scientific authors in the task of communicating chemical structures. They provide chemically intelligent drawing interface that allows chemical scientists to draw almost any chemical structure including organics, organometallics, polymers, and Markush structures.

a) Briefly discuss their features under the following headings:

   v. Drawing

   vi. Structure Searching

   vii. Reporting

   viii. Interface Design (16 marks)

    ix.

b) Briefly mention at least **FOUR** benefits of these tools. (4 marks)

   x. Question 3

a) Using a well-labeled diagram, briefly discuss the basic components/elements of a data communication system (6 marks)

  xi.

b) Mr. Sam runs a small distribution business. He has recently identified the following risks to his business and he wishes to take appropriate measures to tackle these.

 xii. "Risks of poor health in his employees caused by their use of the company's computer systems. He is particularly concerned about his order handling staff who could potentially work on computer systems all day entering information into the system."

xiii.

 (i) What health risks do these employees potentially run and how might these be addressed?

                    xiv. (6 marks)

   xv. "Risk of business disruption and loss of business and data caused by broken, damaged systems in the

  xvi. business"

 (i) What measures might Mr. Sam take to minimize these risks? (4 marks)

  xvii.

xviii.   *"Risks of business loss and fraud caused by unauthorized use of the computer systems in the business"*

  (i)   What measures might Mr. Sam take to minimize these risks?   (4 marks)

xix.

Question 4

xx.

a) Briefly discuss the following ways of acquiring Software, giving advantage and limitation of each:

   i.   Buying pre-written (Off-the-shelf) software
   ii.   Ordering customized software
   iii.   Developing In-house (customized) software
   iv.   Downloading public-domain software   (10 marks)

      xxi.

b)   'The Internet is a network of computers that links many different types of computers all over the world. Initially used only by research organizations and universities to share and exchange information, but has rapidly grown and continues to grow at a rapid pace. It interconnects more than 30,000 networks, allowing more than 10 million computers and more than 50 million computer users in more than 150 countries to communicate with each other.'

xxii.   Discuss any **FIVE** key reasons why security is an issue on the Internet?

                                                           xxiii.   (10 marks)

xxiv.   Question 5

a) 'Developing software and putting it to use is a complex process.'

xxv.

   i.   Give the **FIVE** key steps/phases involved in the process   (5 marks)
   ii.   Briefly discuss the purpose of program planning   (5 marks)

      xxvi.

b) Discuss any **FIVE** areas/sectors where computers are applied, stating their major functional importance.

                                                           xxvii.   (10 marks)

  xxviii.

  xxix.