TECHNICAL UNIVERSITY OF MOMBASA

INSTITUTE OF COMPUTING AND INFORMATICS

Select department

UNIVERSITY EXAMINATION FOR:

BSCE/SEP2016/J-FT

SMA 2174: INTRODUCTION TO COMPUTER SCIENCE

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER 2018

TIME: 2HOURS

DATE: Sep2018

Instructions to Candidates
You should have the following for this examination
-*Answer Booklet, examination pass and student ID*
This paper consists of **FIVE** questions. Attemptquestion ONE (Compulsory) and any other TWO questions.
Do not write on the question paper.

Question ONE
(a)Explain the approach to solving a problem referred to as divide and conquer   (4 marks)
 (b) identify and explain two forms of divide and conquer for problem solving (6 marks)
c) Explain the term recursion as applies to computer science   (2 marks)
d) Outline seven(7) levels of abstraction in a computer   (7 marks)
e)Briefly explain the use of computing language   (1marks)
f) Explain the three components for construction of a computing language (6 marks)

Question TWO

a) Explain why computing systems are designed around discrete values instead of continuous ones (4 marks)
b) How relevant is knowledge of computer science to an Architect?   (2marks)
c) Distinguish among the following terms in computer science:
    (i)   Procedure   (2marks)
    (ii)   Process   (2marks)
    (iii)   Algorithm   (2marks)
c) Contrast between computer science and Engineering   (4 marks)
 (b) How is recursion used in the definition of Grammar in Backus Neu Form in computer science
                            (4 marks)

Question Three
    a)   Explain the following terms in programming

(i)   Expression   (2 marks)
(ii) Primitive   (2 marks)

    (iii) operand   (2 marks)

    iv) data abstraction   (2 marks)

b)Outline the structural relationship between von neuman computer model and programming languages
(4 marks)

c) (i) Explain what concerns the abstraction levels of programming languages
(5 marks)

(ii) What instructions do the machine code encode   (3 marks)

Question Four
   a) Describe the structure and processing of each of the following data structures
       (i)   List   (2 marks)
       (ii)   Tree   (2 marks)
       (iii)   Dictionary   (2 marks)
       (iv)   Array   (2 marks)
       (v)   Queue   (2 marks)
       (vi)   Stack   (2 marks)
   b)   Differentiate between Depth -first and Breath-first tree search algorithm
                       (4 marks)
   c)Identify and explain the data structure used by each of the Depth -first and Breath-first in the search
                       (4marks)

Question Five
(a) Explain the primitive operations done by the processor   (5 marks)
Move data
Comparison
Arithmetic
Store
Jump
b) The languages above the machine language are abstractions to the machine language.
Explain the three different translators used to translate the abstraction languages into machine language
understandable to the processor   (6marks)

(c) Explain the finite state model of a process of computing   (9 marks)