KABARAK   UNIVERSITY

UNIVERSITY EXAMINATIONS
2014 / 2015 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF COMPUTER SCIENCE
COMP 211: DATA STRUCTURES

DAY: WEDNESDAY   **DATE: 8/04/2015**

TIME: 2:00PM – 4:00PM   **STREAM: Y2S1**

INSTRUCTIONS:

Question ONE is compulsory and any other two questions

QUESTION ONE (compulsory)

a) Distinguish between data structures and algorithms   (2mks)

b) Explain the following three properties on algorithm;

i) Definiteness

ii) Finiteness

iii) Effectiveness   (6mks)

c) i)With the help of a diagram, describe a stack   (8mks)

   ii) Distinguish between a pop and push operation in stacks   (4mks)

   iii) State two benefits of data abstraction   (2mks)

d) i)Define a list data structure   (1mk)

   ii) Describe two ways to implement a list   (4mks)

e) Using a diagram, describe the following operations on a list

   i)   Insertion

   ii)   Deletion   (3mks)

QUESTION TWO

a) Using an element, three nodes, and next element, describe a linked list   (2mks)

b) Using appropriate diagrams distinguish between a doubly linked list and circular doubly linked list   (7mks)

c) Distinguish between enqueue and dequeue operation in queues   (2mks)

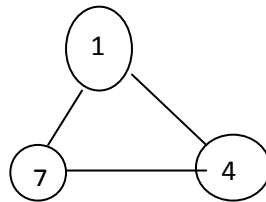d) Explain four queue applications (9mks)

QUESTION THREE

a) Describe the following properties in trees;
   i)   Sibling
   ii)   Root
   iii) Edge
   iv)   Path length (4mks)

b) Distinguish using appropriate diagram between
   i)   Binary trees
   ii)   Perfect binary tree (6mks)

c) Using the diagram below, traverse the tree using

   i)   In order traversal
   ii)   Pre- order traversal
   iii) Post order traversal (10mks)

QUESTION FOUR

a) Explain the following sort operations
   i)   Insertion sort
   ii)   Bubble sort (4mks)

b) Using appropriate graphs, describe the following searches
   i)   Depth first
   ii)   Breadth first (10mks)

QUESTION FIVE

a) i)Describe a searching operation in data structures (2mks)

ii) Explain the following searches
   1) Linear search
   2) Binary search (8mks)

b) Describe the following sorts
   (i)   Selection sort
   (ii)   Bubble sort   (10mks)