UGANDA MARTYRS UNIVERSITY
NKOZI

UNIVERSITY EXAMINATIONS

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION SYSTEMS

END OF SEMESTER FINAL EXAM

SECOND YEAR EXAMINATION FOR BACHELOR OF INFORMATION TECHNOLOGY, GENERAL, COMPUTER SCIENCE & EDUCATION (LUBAGA &NKOZI)

Programming Data Structures and Algorithms
CSC2103

DATE: Thursday 14th DECEMBER 2022 TIME: 2:00 pm - 5 :00 pm

DURATION: 3HRS

Instructions:

1. *Carefully read through ALL the questions before attempting*
2. ***Answer ANY 8 Questions***
3. *No **names** should be written anywhere on the examination book.*
4. *Ensure that your **Reg number** is indicated on all pages of the examination answer booklet.*
5. *Ensure your work is **clear** and **readable**. Untidy work shall be penalized*
6. *Any type of examination Malpractice will lead to automatic disqualification*
7. *Do not write anything on the question paper.*

Qn1. Explain the following terminologies

a. Algorithm
b. Data
c. entity
d. Group data item
(10 Marks)

Qn2. Write about any three data structures. (10 Marks)

Qn3. Explain any 5 data structure operations. (10 Marks)

Qn4. Write an algorithm which deletes the Tth element from a non-empty array DATA containing N elements. (10 Marks)

Qn5. With clear examples write about the various notations used while writing expressions. (10 Marks)

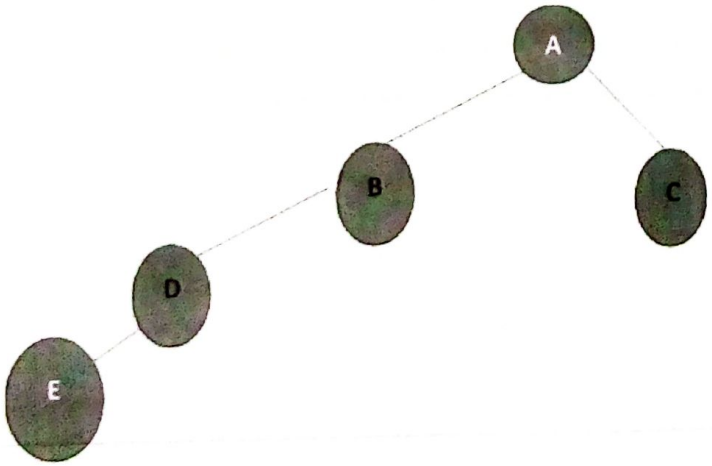
Qn6. By inspection and hand translate the following expressions from infix to prefix
i) d*k ii) r * m ^ j + p (10 Marks)

Qn7. Given the expression M: **6 * 2 + 3 - 5**

With the help of the stack:
a). Convert M from infix to its equivalent postfix expression P (5 Marks)
b) Evaluate P (5Marks)

Qn8. Given the following expression w: a *b - c ^d
a) Give the tree T representation of the above expression W.
b) List all the leaves in T
c) List all the descendants in T (10 Marks)

Qn9. Given the following tree T:



a) State all the right children in the above tree T.

b) Give the height of the above tree T.

c) Give the link or the single array representation of the above tree T

(10 Marks)

THE END