



PAN AFRICA CHRISTIAN UNIVERSITY

(BACHELOR OF BUSINESS INFORMATION TECHNOLOGY)

END OF TERM EXAMINATION

DEPARTMENT: COMPUTING & INFORMATION TECHNOLOGY

COURSE CODE: BIT 200

CAMPUS: ROYSAMBU

COURSE TITLE: DATA STRUCTURES AND ALGORITHMS

EXAM DATE: FRIDAY, 09TH AUGUST 2019

TIME: START HOUR – END 17:30-19:30 HRS

INSTRUCTIONS

- This exam script has **TWO (2)** sections.
- Read all questions carefully before attempting.
- Answer All questions in Section **A** and any other Three questions in Section **B**.
- Write only your **student number** on the answer booklet provided.
- None programmable calculators permitted
- Calculators on phones, tablets and computers are NOT permitted in Theory Papers

SECTION A

(Answer ALL questions in this section)

Question 1

- a) Define the term **Data Structure**, giving two examples (2 Marks)
- b) Explain the term **Tree** as used in data structures (2 Marks)
- c) Distinguish a **set** from an **array** (4 Marks)
- d) Illustrate the concept of **graph** as used in data structures and algorithms

(4

Marks)

- e) Distinguish Depth-First Search from Breadth-First Search (4 Marks)
- f) Describe **recursion** and its rationale in computing (6 Marks)
- g) Explain any **FOUR** application areas of data structures in computing (8 Marks)

SECTION B

(Answer any FOUR (4) questions in this section)

Question 2

- a) Describe **TWO** searching techniques used in data structures (6 Marks)
- b) Describe the difference between STACKS and QUEUES (4 Marks)

Question 3

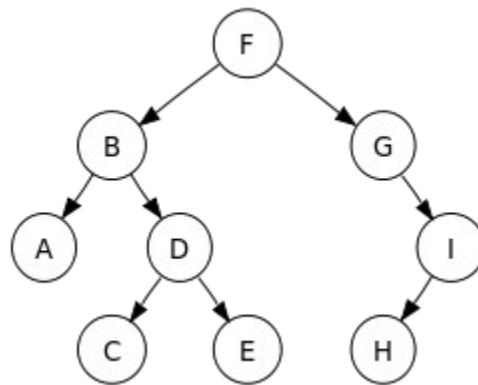
- a) Explain any **THREE** features that describe tree data structure (6 Marks)
- b) Using a well label diagram, distinguish **level** from **height** of a tree data structure (4 Marks)

Question 4

- a) State the criteria for constructing a complete binary tree (3 Marks)
- b) Define the following terms as used in data structures trees
 - i. Search tree (2 Marks)
 - ii. Tree traversal (2 Marks)

c) Traverse the tree given below using the sequences given. List the elements in the nodes in the order of their respective traversals.

- i. Pre-order (1 Mark)
- ii. in-order (1 Mark)
- iii. Post-order (1 Mark)



Question 5

- a) Define a pointer and explain the term "pointer dereferencing" (4 Marks)
- b) State your understanding of the term **algorithm** and write a simple algorithm to display the area of a circle (6 Marks)

Question 6

- a) Describe the concept of **linked list** as used in data structures and algorithms (4 Marks)

- b) It's advantageous to use singly linked list over doubly linked list. Explain. (6 Marks)

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