PAN AFRICA CHRISTIAN UNIVERSITY

BBIT, BSCIT

END OF TERM EXAMINATION

DEPARTMENT:	**COMPUTING & INFORMATION TECHNOLOGY**
COURSE CODE:	**BIT 200**
CAMPUS:	**ROYSAMBU**
COURSE TITLE:	**DATA STRUCTURES AND ALGORITHMS**
EXAM DATE:	**TUESDAY, DATE (DDTH MONTH YEAR)**
TIME:	**START HOUR – END 08:00-11:00 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.**
- 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) Explain any TWO areas for which Data structures and algorithm is applied **(2 Marks)**

b) Describe the rationale for the directed and undirected graph for searching in computer applications **(2 Marks)**

c) Describe the concept of trees as used in data structures and algorithms **(3 Marks)**

d) Explain the rationale for recursions in computer applications **(3 Marks)**

SECTION B

(Answer any FOUR (3) questions in this section)

Question 2

a) Describe any TWO demerits of recursions in computing **(4 Marks)**

b) Highlight THREE attributes of a stack **(3 Marks)**

c) Describe any THREE features of a good algorithm **(3 Marks)**

Question 3

a) Describe the concept of binary search, clearly showing how it eases computational problems in computing **(4 Marks)**

b) Explain THREE sorting mechanisms implementable in computer systems **(6 Marks)**

Question 4

a) As a programmer, explain THREE scenarios where you would prefer using linked lists over queues **(6 Marks)**

b) Explain FOUR application areas of SEARCHING in a computer system **(4 Marks)**

Question 5

a) With the aid of examples, distinguish depth-first search from breadth-first search in data structures and algorithms **(4 Marks)**

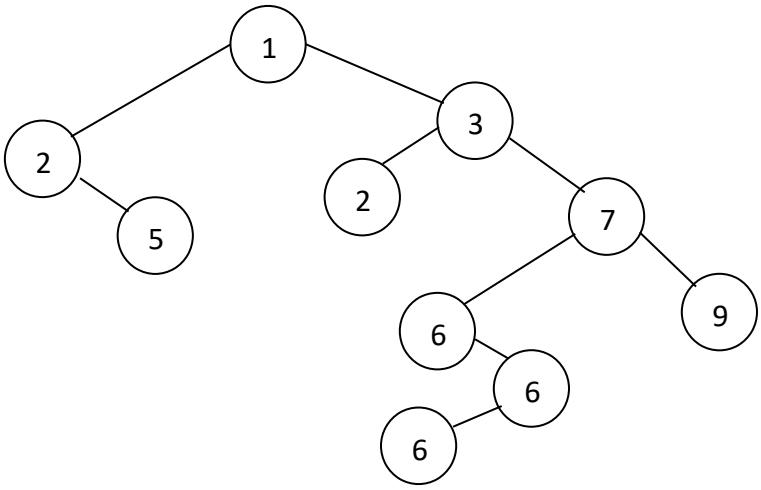
b) Traverse the tree given below using the sequences given. List the elements in the nodes in the order of their respective traversals.

i. Pre-order **(1 Mark)**

ii. in-order **(1 Mark)**

iii. Post-order **(1 Mark)**

iv. With your knowledge of AVL trees, justify whether the tree below is balanced or not **(3 Mark)**



Question 6

a) Enumerate FOUR reasons for making the data modeling approach the most preferred paradigm in computer logic programming **(4 Marks)**

b) Explain THREE application areas of sorting in a computer system **(6 Marks)**

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