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:	**DAY OF WEEK, DATE (DDTH MONTH YEAR)**
TIME:	**START HOUR – END 13:00-17:00 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) Briefly explain any TWO application areas for Data structures and algorithms **(2 Marks)**

b) Explain the significance of sorting in computer applications **(4 Marks)**

c) With the aid of real-life use cases, distinguish STACKS from QUEUES **(4 Marks)**

SECTION B

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

Question 2:

Describe any TWO search techniques found in data structures and algorithms **(10 Marks)**

Question 3:

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

b) As a programmer, explain THREE reason as to why you will prefer using singly-linked lists over doubly-linked lists **(6 Marks)**

Question 4:

a) State the criteria for constructing a complete binary tree **(1 Mark)**

b) Define the following terms as used in data structures

i. Tree size **(2 Marks)**

ii. Tree traversal **(2 Marks)**

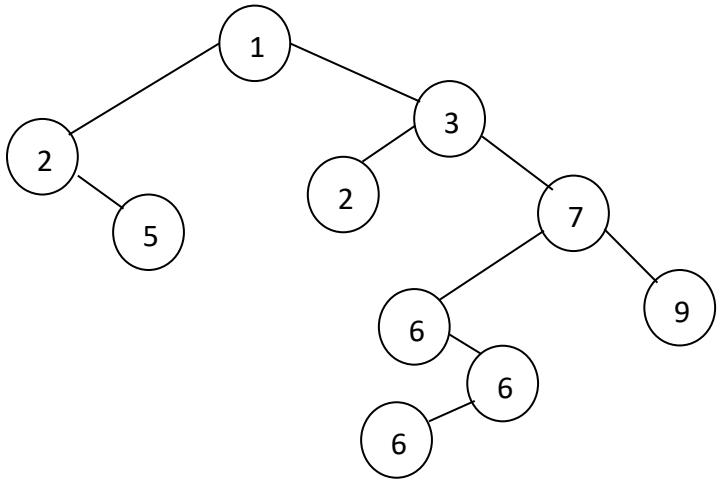
iii. Search tree **(2 Marks)**

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:

As a software project manager, you prefer your team to build Logical Data Models. Enumerate the reasons that are making this approach the most preferred paradigm **(10 Marks)**

Question 6:

a) Illustrate the result of each of the operations ENQUEUE(Q, 4), ENQUEUE(Q, 1), ENQUEUE(Q, 3), DEQUEUE(Q), ENQUEUE(Q, 8), and DEQUEUE(Q) on an initially empty queue Q stored in array Q [1 . . 6]. **(4 Marks)**

b) Describe any THREE desirable features for an ideal algorithm **(6 Marks)**

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