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**23MCU522**

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**BSc DEGREE EXAMINATION MAY 2025**
(Fifth Semester)

Branch – **MATHEMATICS WITH COMPUTER APPLICATIONS**

**DATA STRUCTURES AND ALGORITHEM**

Time: Three Hours Maximum: 50 Marks

**SECTION-A (5 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (5 x 1 = 5)

1 If the logical or mathematical model of a particular organization of data
a)Structure b)variable c)function d) data structures

2 Which of the following is required for Binary Search to work?
a) The array must be sorted
b) The array must be unsorted
c) The array should be a linked list
d) The array should have an odd number of elements

3 Which data structure follows the LIFO (Last In, First Out) principle?
a) Queue b) Stack c) Linked List d) Heap

4 What is the time complexity of inorder, preorder, and postorder traversal of a binary tree?
a) O(1) b) O(n) c) O(log n) d) O(n log n)

5 Which sorting algorithm has the best time complexity of O(n log n) and is stable?
a) Quick Sort b) Merge Sort c) Heap Sort d) Bubble Sort

**SECTION - B (15 Marks)**
Answer **ALL** Questions
**ALL** Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Classification of data structures with suitable example.
OR
b Describe control structures.

7 a Explain about linked lists.
OR
b Write short note about traversing linked list.

8 a Describe stacks.
OR
b Explain about Array represent of stacks.

9 a Explain traversing binary trees.
OR
b Explain deleting in a binary search tree.

10 a Explain about selection sort.
OR
b Explain about radix short.

**Cont...**

## SECTION -C (30 Marks)

Answer **ALL** questions
**ALL** questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Describe data structures operations.

OR

b Clarify representation of linear array in memory.

12 a Explain about linear search and binary search.

OR

b Explain about insertion into a linked list and deletion from a linked list.

13 a Explain about Arithmetic expression.

OR

b Explain Link representation of queues

14 a Define binary trees and also representing binary trees in memory

OR

b Explain about searching and inserting in binary search trees

15 a Define shorting and also explain in insertion sort

OR

b Explain about merge short

Z-Z-Z END