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19CMU07

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Second Semester)

Branch – **COMPUTER SCIENCE**

DATA STRUCTURES

Time: Three Hours Maximum: 50 Marks

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

1 Data may be organized in many different ways the logical or mathematical model of a particular organization of data is called a _____
(i) Data Structures (ii) variable-length record
(iii) fixed-length record (iv) data item

2 _____refers to the operation of finding the location of a given item in a collection of items.
(i) Searching (ii) Sorting
(iii) Array (iv) Function

3 First Node of linked list is called as_____
(i) location (ii)Head
(iii) Value (iv) Data

4 A _____is a linear structure in which items may be added or removed only at one end.
(i) stack (ii) queue
(iii)pointer (iv) list

5 A binary tree T is defined as a finite set of elements, called _____
(i) nodes (ii)data
(iii)element (iv) item

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

6 a Describe the major operation performed by data structure.
OR
b Classify the various types of string operation.

7 a Elucidate the concept of bubble sort and write its algorithm with an example.
OR
b Compute the time complexity of binary search algorithm.

8 a Write short notes on Doubly Linked List with neat diagram.
OR
b Construct the algorithm for searching an item in linked list.

9 a Compare the difference between Stack and Queue.
OR
b Evaluate the following postfix expression : 6 2 3 + - 3 8 2 / + * 2 ↑ 3 +

Cont...

10 a Illustrate on Tree Terminology.

OR

b List out the steps involved in deleting a node from a binary search tree

SECTION -C (30 Marks)

Answer **ALL** questions

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

11 a Determine the some common types of Data Structure.

OR

b Summarize about Sparse Matrix. How to construct the representation of sparse matrix?

12 a Demonstrate the insertion sort results for each insertion for the following initial array of elements – 25, 6, 15, 12, 8, 34, 9, 18, 2

OR

b Illustrate Hashing. Explain various types of hash function used to place the record in a hash table

13 a Explain the basic operation performed in Linked List.

OR

b Point out the terms of dynamic memory allocation functions.

14 a Elaborate on the various Primitive operations performed in Stack. Write its algorithm and give an example.

OR

b Explain how to represent the linked queue and circular queue with neat diagram?

15 a Summarize about Binary Tree Traversal with neat digram.

OR

b Explain the Heap sort with an algorithm. Construct a heap from the given array {81,89,9,11,14,76,54,22} and convert it into max heap.

Z-Z-Z END