20SSP09

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
MSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch –**SOFTWARE SYSTEMS**
(Five year integrated)

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. What is the disadvantage of array data structure?
   (i) The amount of memory to be allocated should be known before hand
   (ii) Elements of an array can be accessed in constant time
   (iii) Elements are stored in contiguous memory blocks
   (iv) Multiple other data structures can be implemented using arrays

2. In a stack, if a user tries to remove an element from an empty stack it is called _____
   (i) Empty collection (ii)Underflow
   (iii) Overflow (iv)Garbage Collection

3. What is a full binary tree?
   (i) Each node has exactly zero or two children
   (ii) Each node has exactly two children
   (iii) All the leaves are at the same level
   (iv) Each node has exactly one or two children

4. What is the speciality about the inorder traversal of a binary search tree?
   (i) It traverses in a non increasing order
   (ii) It traverses in an increasing order
   (iii) It traverses in a random fashion
   (iv) It traverses based on priority of the node

5. Merge sort uses
   (i) Backtracking
   (ii) Heuristic approach
   (iii) Greedy approach
   (iv) Divide-and-conquer

SECTION - B (15 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 x 3 = 15)

6 a. What is meant by ADT? Give Examples for ADT.

OR

b. When is a matrix called a Sparse Matrix? How it is implemented.

7 a. Illustrate how elements are inserted and deleted in Stacks?

OR

b. Discuss about Priority Queues with any numerical example.

8 a. Discuss about Dynamic Storage Management.

OR

b. With an suitable example , explain various tree traversals techniques.

9 a. Discuss about deletion in a BST with appropriate example.

OR

b. What is a graph explain with example in data structure?

10 a. State the importance of Hashing.

OR

b. Enumerate about the Time complexity of Insertion Sort and Selection Sort.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

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

11 a. Elucidate about Best, Worst and Average case time complexities with example.

OR

b. How a three-dimensional array will be implemented. Write pseudo code for implementing 3 Dimensional Arrays.

12 a. List the various applications of Stacks.

OR

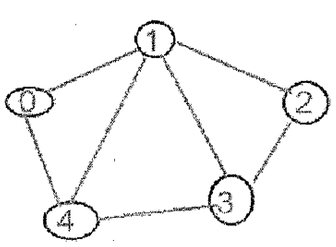
b. Compare and contrast Stacks and Queues.

13 a. Enumerate how data are inserted in
(i). Front of the Singly Linked List
(ii). At the end of the Singly Linked List
(iii). Any other position of the Singly Linked List

OR

b. Starting with an empty Min Heap tree, insert the following number in the given order of the Min Heap Tree. 5, 1, 2, 7, 10, 31, 6, 11, 3, 4

14 a. For the following graph find out the
(i) Adjacency Matrix
(ii)Adjacency List



OR

b. Compare and Contrast BFS and DFS.

15 a. Explain Quadratic Probing and Double Hashing with suitable example.

OR

b. Sort the following numbers using Quick Sort Method.
45,85,14,12,3,1,8,19,25,36,44

Z-Z-Z END