Manimegalai

# Avinashilingam Institute for Home Science and Higher Education for Women

**(Deemed to be University under Category 'A' by MHRD, Estd. u/s 3 of UGC Act 1956)**
**Re-accredited with 'A+' Grade by NAAC. Recognised by UGC Under Section 12B**
**Coimbatore - 641 043, Tamil Nadu, India**

## Bachelor's Degree Examination – June / July 2021
## II Semester

**Class : I UG** **Time : 3 Hours**
**Major : Computer Applications** **Max. Marks : 100**

## 18BCAC05 Data Structures and Algorithms

**Part A** **10 x 1 = 10**
**Choose the Correct Answer**

1. Every element in the array can be accessed using CO1 K1
   a. index b. boundry
   c. array name d. data type

2. _____ list of finite number of homogenous data elements. CO1 K1
   a. Array b. Linked list
   c. Table d. Tree

3. QUEUE data structure follows CO2 K1
   a. SJF b. LIFO
   c. FIFO d. RR

4. In STACK _____ function is used to insert an element. CO2 K1
   a. push b. pop
   c. delete d. length

5. Visiting each node in the tree is known as CO3 K2
   a. traverse b. insertion
   c. deletion d. reference

6. Sub graph with all vertices of a tree is known as CO3 K2
   a. Spanning tree b. Binary tree
   c. AVL tree d. B+ tree

7. Arranging the elements in an order is known as CO4 K1
   a. searching b. sorting
   c. traversing d. viewing

8. Time complexity of Insertion sort is CO4 K2
   a. $O(n^2)$ b. O(n logn)
   c. O(n) d. O(1)

9. IOS:: OUT parameter is used to open a file for ____ only. CO4 K2
   a. read b. write
   c. update d. delete

10. File can be accessed by CO4 K2
   a. random b. sequentially
   c. both a & b d. none of the above

**Part B** **5 x 6 = 30**

**Answer ALL questions**

**Each answer should not exceed 400 words or two pages**

| | |
|---|---|
| 11.a. Illustrate the representation of array in memory. | CO1 K1 |
| (or) | |
| 11.b. Explain Theta Notation for complexity of an algorithm. | CO1 K2 |
| 12.a. Illustrate STACK operations with neat example. | CO2 K2 |
| (or) | |
| 12.b. Explain the use of Indexing in String processing. | CO2 K1 |
| 13.a. Build the algorithm for Breadth First Search technique. | CO3 K3 |
| (or) | |
| 13.b. Explain Threaded Binary Tree. | CO3 K2 |
| 14.a. Write an Algorithm to find an element using Sequential Search. | CO4 K3 |
| (or) | |
| 14.b. Explain Bubble Sort technique. | CO4 K2 |
| 15.a. Illustrate Hash Table with an example. | CO5 K1 |
| (or) | |
| 15.b. Mention the advantages of Sequential file Organization. | CO5 K3 |

**Part C** **5 x 12 = 60**

**Answer ALL questions**

**Each answer should not exceed 800 words or four pages**

| | |
|---|---|
| 16.a. Explain the criteria to measure efficiency of an algorithm. | CO1 K1 |
| (or) | |
| 16.b. Illustrate the Operations of an Array. | CO1 K3 |
| 17.a. Convert the given infix expression to postfix expression<br>A+(B * C – (D /E ^ F) * G ) * H | |
| (or) | |
| 17.b. Write an algorithm to insert an element into Linked List. | CO2 K3 |
| 18.a. Illustrate Binary Tree Traversal with suitable example. | CO3 K3 |
| (or) | |
| 18.b. Explain Prim's Algorithm. | CO3 K3 |
| 19.a. Sort the given numbers using Heap Sort {10, 4,2, 13, 1,15}. | CO4 K3 |
| (or) | |
| 19.b. Write an algorithm to find an element using Binary Search. | CO4 K3 |
| 20.a. Explain Different Access method in File Organization. | CO5 K2 |
| (or) | |
| 20.b. Illustrate Hash functions with neat example. | CO5 K3 |

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