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Total No. of Pages : 02

Total No. of Questions : 07

# B.Sc. (Cyber Security) (Sem.–3 DATA STRUCTURE Subject Code : UGCA-1915 M.Code :92752 Date of Examination : 16-12-22

Time: 3 Hrs.

Max. Marks : 60

## INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains SIX questions carrying TEN marks each and students have to attempt any FOUR questions.

## **SECTION-A**

- 1. Write briefly :
  - a. What are the applications of De-queue?
  - b. Which of the tree type Height balanced? List its properties.
  - c. Compare best and worst case of Bubble Sort, Insertion Sort, Quick Sort and Heap Sort.
  - d. Which of the data structure is most useful for Recursion?
  - e. What are the advantages of B+ Trees?
  - f. Define Collision in Hashing. List methods to resolve it.
  - g. How can you traverse a tree?
  - h. Circular Doubly Linked List provides more flexibility in comparison to single linked list. Justify.
  - i. What are the advantages of Array data structure?
  - j. List various library functions of strings.

### **SECTION-B**

- 2. What is the benefit of using AVL Trees as data structure? How Binary Search Trees are different from AVL Trees? Explain with suitable example.
- 3. Why do we need asymptotic notations for data structures? Discuss different notations. Elaborate derivation of time complexity using these notations for best, average and worst case of Binary and Linear Search.
- 4. How Graphs play a role in managing network information? What properties and methods of Graph make them advantageous over Tree data structure? Discuss different Graph traversal algorithms.
- 5. What are the applications of Stack? Discuss different stack operations. Elaborate by evaluating any sample postfix expression using stack.
- 6. Compare merge sort and quick sort algorithm. Explain their working.

#### 7. Write briefly about

- a. Multi-Dimensional Array
- b. Static versus Dynamic Memory Allocation
- c. Circular Queue
- d. Threaded Binary Tree.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.