

Paper Id:

110311

Roll No:

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B. TECH.
(SEM-III) THEORY EXAMINATION 2019-20
DATA STRUCTURE USING C

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- 1. Attempt all questions in brief. 2 x 10 = 20**
- a. What is Time complexity?
 - b. Explain Abstract data types.
 - c. Define AVL tree.
 - d. What is Recursion?
 - e. What is Priority queue? Give an example.
 - f. Explain Tower of Hanoi problem.
 - g. Explain Radix sort. Give an application of Radix sort.
 - h. Define Binary Search tree.
 - i. Define Linked List.
 - j. Explain Compaction

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. Write an algorithm for insertion and deletion operation on circular queue.
 - b. Define tree. Prove that a binary tree with n nodes has exactly (n-1) edge or branches.
 - c. Write a brief about followings (i) Garbage collection (ii) Back tracking
 - d. Describe the difference between abstract data type specification and implementation in detail.
 - e. Give the solution for the following recurrences.
 $T(n) = 2T(n/2) + n \log n$

SECTION C

- 3. Attempt any one part of the following: 10 x 1 = 10**
- (a) Enlist different operations which are normally performed on any linear array.
 - (b) Explain Hashing. What is hash function, Explain with suitable example?
- 4. Attempt any one part of the following: 10 x 1 = 10**
- (a) Write an algorithm for selection sort? What is the complexity of this algorithm?
 - (b) Write a program in C to create a linked list of 10 elements and to traverse the list.
- 5. Attempt any one part of the following: 10x 1 = 10**
- (a) Explain the Warshal algorithm with suitable example.
 - (b) What is Minimum cost spanning tree? Explain Prims algorithm with suitable example.
- 6. Attempt any one part of the following: 10 x 1 = 10**
- (a) Differentiate between B tree and B+ tree with suitable example.
 - (b) Explain M-way Search tree with suitable example.
- 7. Attempt any one part of the following: 10 x 1 = 10**
- (a) Explain and differentiate between DFS & BFS with suitable example.
 - (b) Define Stack. Explain various primitive operations performed on Stack with example.