Sub Code:NCS301

Paper Id: 110311 Roll No:

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.