

B. Tech I Year II Semester (R17) Supplementary Examinations, July/August - 2018

**DATA STRUCTURES**

**(CSE)**

Time: 3 hours

Max Marks: 70

**PART – A**

1. Answer any **TEN** questions (10 x 2 = 20 Marks)
- (a) Show the classification of data structures with a neat diagram
  - (b) Define and give the structure for Circular Double Linked list
  - (c) Provide the prefix and postfix notations of expression  $((A+((B^C)-D))*(E-(A/C)))$
  - (d) Define Dequeue operations
  - (e) Construct tree for the Expression  $(A-B)/((C*D)+E)$
  - (f) Mention the number of comparisons w.r.t best, average and worst cases for the linear search.
  - (g) Define and give example for complete graph and acyclic graph
  - (h) Give example for Left-to-Right rotation in AVL Tree
  - (i) Define Hashing and Give example for hash function?
  - (j) Give example for set and linked representation of graphs.
  - (k) Define B-tree with an example.
  - (l) Define linear probing and give example.

**PART - B**

Answer all **FIVE** units (5 x 10 = 50 Marks)

**UNIT-I**

2. Provide the algorithm for merge sort and sort the following elements using the algorithm steps : 38, 27, 43, 3, 9, 82, 10
- OR
3. Write the Algorithm for Linear Search. Also give suitable example to illustrate the algorithm

**UNIT-II**

4. Differentiate single and doubly linked list. Explain the following insertion operations associated with doubly linked list.
- i. inserting a node in the front
  - ii. inserting a node at the end
  - iii. inserting a node at any position in the list
- OR
5. Discuss the application of linked list to represent the polynomial and perform addition and multiplication operations on them.

**UNIT-III**

6. Develop a C program to implement stack operations. Discuss the Application of stack in solving tower of hanoi problem using recursion.
- OR
7. Define Queue. Discuss the insertion and deletion procedures in the following queue structures by giving suitable example
- Circular Queue
  - Priority Queue

**UNIT-IV**

8. Construct an AVL with the values 15, 20, 24, 10, 13, 7, 30, 36, 25. Also indicate the balance factor at each step
- OR
9. (a) Write the recursive algorithm for Pre-order, In-order and Post-order of binary tree traversal techniques
- (b) Construct the Binary Search Tree for the following sequence  
45, 39, 56, 12, 34, 78, 32, 10, 89, 54, 67

**UNIT-V**

10. Write Floyd's shortest path Algorithm and explain with suitable example
- OR
11. (a) Illustrate the set, linked and sequential graph representations
- (b) Differentiate closed and open collision resolution hashing techniques

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