

Code No: 5258AA

R15

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech I Semester Examinations, February - 2017

DATA STRUCTURES AND ALGORITHMS

(Computer Science and Engineering)

Time: 3hrs

Max.Marks:75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

- 1.a) Define Theta notation and illustrate with an example. [5]
- b) Define vector classes ADT for vector. [5]
- c) Define HashSet and illustrate. [5]
- d) What are the applications of graphs? [5]
- e) State the properties of B-Trees. [5]

PART - B

5 × 10 Marks = 50

2. Explain the Sparse matrix and its representation. Illustrate with an example. In which applications this sparse matrix is used for. [10]

OR

3. Write the subroutines for insert node at the beginning of a single linked list and circular linked list. [10]

4. Explain with an example the push() and pop() operations of stack. Write a program for insertion of elements into a stack. [10]

OR

5. Write a program implementing the insert first() and delete last() functions of DEQUEUE. Illustrate with an example. [10]

6. Apply Quick sort algorithm for the following array of elements and sort the elements (Take the element 28 from the list as the pivot element). Also discuss the complexity of the algorithm for worst case and best case.

28, 32, 12, 5, 48, 13, 35, 11

[10]

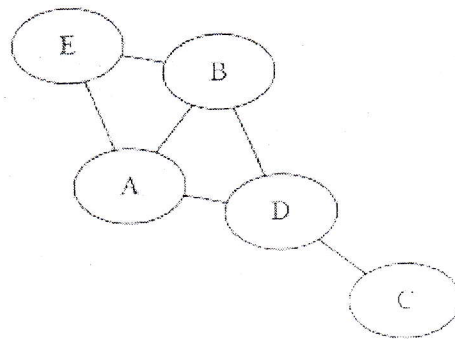
OR

7. Trace the Linear search and Binary search algorithms for the data

{84, 99, 65, 79, 19, 71, 92, 12, 50, 82, 29, 75, 55, 28, 58.}

[10]

8. Explain DFS and BFS and find out the list of visiting nodes for the given graph below stating with E as a source node. [10]



OR

9. Generate the preorder and post order Threaded Binary trees for the set of the values { 50,30,40,10,89,90,45,67,31,78 } [10]

10. Discuss the Huffman coding algorithm and apply on the string {" All is Well"}. [10]

OR

11. Explain the operations for insertion and deletion of elements in Red-black tree with program. [10]

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