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R15

Code No: 5258AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech I Semester Examinations, February - 2016

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) Explain how the base address calculation is done in 1D and 2D arrays. [5]
- b) Explain about priority queue ADT. [5]
- c) List the differences between HashSet and HashTable in Java. [5]
- d) Write DFS algorithm. [5]
- e) Explain Red-Black Search Tree. [5]

PART - B

5 × 10 Marks = 50

- 2.a) Write a Java program to implement Circular list using arrays. [5]
 - b) Differentiate linear and non-linear data structures. [5+5]
- OR**
3. Write a Java program to implement the following operations in Double Linked Lists(DLL). (a) creation of DLL (b) insertion of a node (c) deleting a node. [10]
4. Write a Java program to implement stack operations. [10]
- OR**
5. Write a Java program to implement circular queue using arrays. [10]
6. Write the Merge Sort algorithm and derive its time complexity. [10]
- OR**
7. What is hashing? Explain the different collision resolution techniques used in hashing. [10]
- 8.a) Write an algorithm for insertion sort? Trace the algorithm with the following data: 95, 12, 45, 1, 33, 7, 87
 - b) What are the different applications of Graphs? [5+5]
- OR**
- 9.a) Write an algorithm for single source shortest path?
 - b) Construct the binary tree for the given inorder and postorder traversals.
Inorder: { 4, 2, 5, 1, 6, 3, 7 };
PostOrder : { 4, 5, 2, 6, 7, 3, 1 }; [5+5]
10. Explain TreeSet and TreeMap classes available in java.util package with examples. [10]
- OR**
11. Define B-Tree? Explain how insertion and search operations are done in B-Trees? [10]