R16

Code No: 133AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year I Semester Examinations, May/June - 2019
DATA STRUCTURES THROUGH C++
(Common to CSE, IT)

Time: 3 Hours   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

                                                                (25 Marks)
1.a) Define inheritance and polymorphism.   [2]
  b) Describe omega and theta notations.   [3]
  c) Write the motivation of sparse matrices.   [2]
  d) Explain the ADT of stack.   [3]
  e) What is a binary tree?   [2]
  f) Explain about the ADT of priority queues.   [3]
  g) Define hash function.   [2]
  h) Explain about time complexity of merge sort.   [3]
  i) What is a binary search tree?   [2]
  j) Give an example of DFS.   [3]

PART-B

                                                                (50 Marks)
2.a) Explain constructors and destructors with examples.
  b) Write about linear data structures with examples.   [5+5]
                            OR
3.a) Explain about throwing an exception.
  b) What is recursion? Explain about data abstraction.   [5+5]

4.a) Explain array representation of stack.
  b) Describe circular lists and header nodes.   [5+5]
                            OR
5.a) Discuss in detail about ADT of queue.
  b) Briefly explain about applications of stack.   [5+5]

6.a) Explain about Insertion and deletion operations in max heap.
  b) What are properties of binary trees? Explain.   [5+5]
                            OR
7.a) Discuss about the ADT BinaryTree.
  b) What is a threaded binary tree? Explain.   [5+5]

8.a) Write C++ program for heap sort technique.
  b) Give comparison of searching methods.   [5+5]
                            OR
9.a) Write C++ program for insertion sort technique.
  b) Analyze the time complexity of quick sort technique.   [5+5]

10. Explain the following:
    a) Applications of graphs
    b) Red-black tress.   [5+5]

OR

11. Explain the following:
    a) Adjacency matrix
    b) Insertion into an AVL search tree.   [5+5]

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