PAPER ID : 606607

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Paper ID and Roll No. to be filled in your Answer Book

Roll No. 1 6 7 2 0 1 0 2 0 0 4

B. Tech.

(SEM. VI) (EVEN SEM.) EXAMINATION, 2013

DATA STRUCTURES USING C++

Time : 3 Hours] [Total Marks : 100

1 Attempt any four question : 4×5

a) What is Big O notation? Explain the various important factors for an efficient algorithm.

b) Differentiate between iteration and recursion with suitable example.

c) Discuss the various data types and its role in data structure.

d) What is skip list? Explain sparse table with suitable example.

e) Write an algorithm for insertion operation in linked list.

f) Discuss equivalence problem? Differentiate between stack and queues.

2 Attempt any four question : 4×5

a) How do you search for a data key in a binary search tree, explain.

b) Define degree of a node in graph? Differentiate between an undirected and a directed graph.

c) What is hashing and also evaluate the search efficiency in list.

d) Explain the heap sort algorithm with suitable examples.

e) Write the algorithm for radix sort?

f) Differentiate breath first and depth first graph traversal algorithm with example.

3 Attempt any two questions : **2×10**

a) Explain the space and time complexity? Write the algorithm to insert and delete operation in doubly linked list.

b) What is sparse table? Convert the following infix expression to postfix expression
((A + B) – ((C + D) * E) / F) * G

c) Describe how to put two queues of varying lengths into an array of N slots.

4 Attempt any two questions : **2×10**

a) Show the binary tree expression tree that represents the following preorder expression:
* – + abc – d + e / f + gh

b) Explain tournament trees? The following values are to be stored in hash table
25, 42, 96, 101, 102, 162, 197
Describe how the values are hashed by using division method of hashing with a table size of 7.

c) Define the following terms: graph, directed graph, connected graph, weighted graph, acyclic graph with its suitable example.

5 Attempt any two questions : **2×10**

a) Explain the tower of Hanoi theorem? Write the algorithm to evaluate an arithmetic expression given in postfix form.

b) Explain heap tree? Show the building of Max heap tree using the given below list of data
8, 20, 9, 4, 15, 10, 7, 22, 3, 12

c) Draw the picture of the directed graph specified below:
G=(V,E)
V(G)={1, 2, 3, 4, 5, 6}
E(G)={(1,2), (2,3), (3,4), (4,5), (5,1), (5,6), (2,6), (1,6), (3,6), (4,6), (2,4)}
For this graph, find out its adjacent matrix and the indegree of each vertex.
