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Total No. of Pages : 2

Total No. of Questions : 09

B.Tech. (CSE/IT) (Sem.-3)

DATA STRUCTURES

Subject Code : BTCS-304 (2011 Batch)

Paper ID : [A1126]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

1. Write briefly :

- (a) Differentiate between linear and non-linear data structures.
- (b) What is recursion and its merits and demerits?
- (c) Define the term Heap and its use.
- (d) What is dangling pointer and the solution for handling them?
- (e) What do you mean by the complexity of an algorithm?
- (f) What is Sparse Matrix? How can a sparse matrix be represented in memory?
- (g) Compare the terms Binary tree and Binary search tree.
- (h) Give the advantages of doubly linked list over single linked list.
- (i) What is dynamic memory management?
- (j) What is circular Queue and its applications?

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SECTION-B

2. Define the term Data structure and discuss the criteria used for evaluating the suitability of a particular data structure for a given application.
3. Name various tree traversal algorithms. Create a Binary expression tree from the following expression and traverse it using all possible tree traversals.

$$(A * B/C) * D + E + F/(G+H)$$

4. What are the advantages and disadvantages of representing a group of items as an array versus a linear linked list ?
5. Transform each of the following postfix expressions to Infix:
 - a. $AB - C + DEF - + \$$
 - b. $ABCDE - +\$ * EF * -$
 - c. $ABC + * CBA - + *$
 - d. $AB + C - BA + C\$ -$
6. What is Graph ? How they are different from trees ? Describe in brief the various methods used to represent Graphs in memory.

SECTION-C

7. When do we use Priority queues? Write algorithms *pqinsert* and *pqmindelete* for an ascending priority queue implemented as linked list.
8. Name various sorting algorithms. Which is the most efficient one in the worst case? Describe in brief the Selection sort algorithm. Show the contents of the array after every pass for the given data set:

48 7 26 44 13 23 98 57 100 5 32
9. Write note on the following :
 - (a) Hashing Functions
 - (b) B-Trees