Register Number: …….………..

B.E/B.TECH DEGREE EXAMINATIONS APRIL / MAY 2010

Second Semester

CSE102: DATA STRUCTURES

(Common to B.E – Computer Science & B.Tech-Information Technology)

Time: Three Hours   **Maximum Marks: 100**

Answer All Questions:-

PART A (10 x 1 =10 Marks)

1. Two main measures for the efficiency of an algorithm are

    a. Processor and memory   b. Complexity and capacity

    c. Time and space   d. Data and space

2. The complexity of the average case of an algorithm is

    a. Much more complicated to analyze than that of worst-case

    b. Much simpler to analyze than that of worst case

    c. Sometimes more complicated and some other times simpler than that of worst case

    d. None or above

3. Which of the following data structure is not linear data structure?

    a. Arrays   b. Linked lists   c. Both of above   d. None of above

4. The operation of processing each element in the list is known as

    a. Sorting   b. Merging   c. Inserting   d. Traversal

5. Which of the following is the feature of stack?

    a. All operations are at one end

    b. It cannot reuse its memory

    c. All elements are of different data types

    d. Any element can be accessed from it directly

6. Pushdown list means:

    a. Stack   b. Queue   c. Linked list   d. All of the above

7. Of the following tree structure, which is efficient considering space and time complexities?

    a. Incomplete Binary Tree   b. Complete Binary Tree

    c. Full Binary Tree   d. Stacked Binary Tree

8. In tree construction which is the suitable efficient data structure?

    a. Array   b. Linked list   c. Stack   d. Queue

9. Sorting is not possible by using which of the following methods?

   a. Insertion   b. Selection   c. Exchange   d. Deletion

10. The complexity of Binary search algorithm is

   a. O(n)   b. O(log n)   c. O(n2)   d. O(n log n)

PART A (10 x 2 = 20 Marks)

11. State the verification of program segments with loops.

12. Define algorithm.

13. State the difference between an array and a linked list.

14. What is an ADT?

15. List out the few applications of stack.

16. What is a circular queue?

17. Construct binary tree for the following infix expression A+B*C/D.

18. What is a binary heap? Give an example.

19. Explain the different types of sorting.

20. How is insertion sort different from selection sort?

PART C (5 x 14 = 70 Marks)

21. a) Explain the aspects that should be considered while problem solving .

(OR)

  b) Discuss the various measures which are used to analyze the performance of an algorithm

22. a) (i)Write an algorithm to insert and delete an element in a doubly linked list.   (8)

    (ii) Give an integer k, write a procedure to delete the kth element from a doubly linked

       list.   (6)

(OR)

  b) (i) Explain in detail the applications of linked list.   (6)

    (ii) Write the algorithm for insertion and deletion operation performed in circular queue.

                                    (8)

23. a) Explain the linked list implementation of stack ADT in detail.

(OR)

  b) (i) Explain the various applications of queues.   (6)

    (ii) Explain the implementation of circular liked list.   (8)

24. a) What are the various tree traversal methods? Explain.

(OR)

   b) (i)What is a threaded binary tree? How do you represent binary tree using list?   (8)

   (ii) There are 8, 15, 13 and 14 nodes respectively in 4 different trees. Which of them is capable of forming a full binary tree.   (6)

25. a) Write an algorithm for quick sort. Sort the given values using quick sort.

   65 70 75 80 85 60 55 50 45

(OR)

   b) (i) Sort the given elements using Heap Sort.   (6)

   31 41 59 26 53 58 97

   (ii) Explain binary search tree with an example.   (8)

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