Register Number: ………………

B.E. DEGREE EXAMINATIONS: NOV/DEC 2010

Third Semester

CSE 201: DATA STRUCTURES AND ALGORITHMS

(Common to Electronics and Communication Engineering, Electrical and Engineering & Electronics and Instrumentation Engineering)

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

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. How will you analyze an algorithm
   a) Space analysis   b) Time analysis   c) Both a and b   d) Neither 'a' nor 'b'

2. Which of the following algorithm is not using divide and conquer design technique
   a) Quick Sort   b) Binary search   c) Insertion Sort   d) Merge sort

3. What is the working principle of a Stack
   a) FIFO   b) LIFO   c)LRU   d) MRU

4. Select the non linear data structure
   a) Linked list   b) Array   c) List   d) Tree

5. Find the average case time complexity of a binary search tree
   a) $O(N^2)$ b) $O(\log N)$ c) $O(N)$ d) $O(N^3)$

6. What is the height of a binary search tree for the input sequence: 2,3,4,5
   a) 3   b)4   c) 5   d)6

7. What is the worst case time complexity of a quick sort
   a) $O(N^2)$ b) $O(N \log N)$ c) $O(N)$ d) $O(N^3)$

8. Select external sorting method
   a) Insertion sort   b) Heap sort   c) Multiway merge   d) Shell sort

9. Which algorithm is used to find minimum cost spanning tree
   a) Dijkstra's   b) Prim's   c) Replacement selection   d) Topological sort

10. Select the graph traversal technique
    a) In order   b) Depth first   c) Post order   d) All the above

PART B (10 x 2 = 20 Marks)

11. State the uses of Top down design.

12. Define verification
13. Write an algorithm to insert an item in the queue.
14. What is ADT?
15. Insert the numbers in sequence: 12, 34, 65, 78, 23, 45 and 100 in binary search tree.
16. Define hash function and write its property
17. What is max heap? Give an example.
18. Why do we need external sorting? Define any one method.
19. How will you represent a graph? Give one method.
20. When will you say the graph is biconnected?

PART C (5 x 14 = 70 Marks)

21. a) Discuss about any two algorithm design techniques with an example.
    (OR)
    b) (i) Write a note on algorithm analysis with example   (6)
        (ii) Explain about algorithm implementation   (8)

22. a) Write an algorithm to do the following operations on stack
        (i) PUSH   (4)
        (ii) POP   (4)
        (iii)To get top of the stack   (2)
        (iv) Is stack empty?   (2)
        (v) Is stack full?   (2)
    (OR)
    b) Write an algorithm to create a single linked list, to insert an item in all positions and delete an item in all positions.

23. a) Write an algorithm to create a binary search tree and insert an item in it explain with an Example.
    (**OR**)
    b) Explain in detail about all types of open addressing techniques.

24. a) Write an algorithm to sort N numbers using heap sort with an example
    (OR)
    b) Discuss about external sorting.

25. a) Explain about dijkstra's algorithm with an example.
    (OR)
    b) Write an algorithm to find minimum cost spanning tree with an example.

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