

B.E / B.TECH DEGREE EXAMINATIONS:MAY/JUNE 2014

(Regulation 2009)

Second Semester

CSE102:DATA STRUCTURES

(Common to CSE & IT)

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. What is the time complexity of an algorithm which has only one loop structure
 - a) $O(\log N)$
 - b) $O(N)$
 - c) $o(N \log N)$
 - d) $O(N^2)$
2. Top down approach is
 - a) Object centric
 - b) Real world things centric
 - c) Algorithmic Centric
 - d) None
3. Josephus problem is the application of
 - a) Linked list
 - b) stack
 - c) queue
 - d) Circular linked list
4. Linear data structure is
 - a) Array
 - b) Linked list
 - c) Tree
 - d) a&b
5. Working principle of stack is
 - a) LIFO
 - b) FILO
 - c) FIFO
 - d) LILO
6. Queue Application is
 - a) Postfix evaluation
 - b) infix to postfix conversion
 - c) Job scheduling
 - d) Parenthesis Matching
7. Which tree has maximum value item at root node
 - a) Binary tree
 - b) binary search tree
 - c) max heap
 - d) min heap
8. In expression tree, --- traversal is most appropriate
 - a) In order
 - b) post order
 - c) preorder
 - d) DFS

9. Time complexity of Binary search is
 - a) $O(\log N)$
 - b) $O(N)$
 - c) $o(N \log N)$
 - d) $O(N^2)$
10. The need of external sort is
 - a) Less time
 - b) less number of codes
 - c) less memory
 - d) less nodes

PART B (10 x 2 = 20 Marks)

11. Write an algorithm which has time complexity of $O(\log N)$
12. List out the advantages of top down design.
13. Write a program segment to add a node in front position of a linked list whose first node is pointed by FIRST pointer.
14. Distinguish between array and linked list.
15. State the basic operations of stack?
16. What are the advantages of circular queue?
17. Construct a map for the input: 12,87,38,96,45, 67,2,34 and 35
18. Give an example for each of the following: Binary tree, Binary search tree and AVL tree
19. List out any three external sorting method
20. Write a program to do linear search.

PART C (5 x 14 = 70 Marks)

21. a) Explain in detail about problem solving techniques with an example.

(OR)

- b) Write a note on the following

- (i) Algorithm efficiency (7)
- (ii) Algorithm Analysis (7)

22. a) Write an algorithm to do the following on doubly linked list:

- 1) Create a doubly linked list (4)
- 2) To add a node at all positions (3)
- 3) To delete a node (3)
- 4) Display the list (2)
- 5) To search an item (2)

(OR)

b) Write an algorithm to do polynomial addition, subtraction

23. a) Explain any four basic operations on stack

(OR)

b) Write an algorithm to implement

(i) Circular queue (7)

(ii) Josephus problem (7)

24. a) Write an algorithm to create AVL tree with all sub routines

(OR)

b) Explain all tree traversal techniques with an example

25. a) Write an algorithm for Merge sort.

(OR)

b) Explain external sort in detail.
