FACULTY OF ENGINEERING

B.E. 2/4 (CSE) I-Semester (Main) Examination, November / December 2012

Subject : Data Structures Using C++

Time : 3 Hours   **Max. Marks: 75**

*Note: Answer **all** questions of Part - A and answer any **five** questions from Part-B.*

PART – A (25 Marks)

1. What is the time complexity of insertion into an array? Compare the time complexity with insertion into linked list. (3)

2. What is a sparse matrix? Explain the sparse matrix representation. (3)

3. What are the applications of stacks? (2)

4. Evaluate the given post fix evaluation: **6 2 3 + - 3 8 2 / + * 2 3 / +**

   What is the stack top after evaluating the given expression? (2)

5. Write down the code snippet to count the number of nodes in a single linked list. (3)

6. What is the graph called in which every node u in G is adjacent to every other node v in G? (2)

7. What is minimum and maximum number of elements in an m-way search tree of height h? (2)

8. What is meant by minimum-cost spanning tree? (2)

9. Explain LL and LR rotation to balance the AVL tree with an example. (3)

10. Consider an array of 100 sorted numbers. Atmost how many searcher are needed to search an element using Binary Search. Justify your answer. (3)

PART – B (5x10=50 Marks)

11. Write a function to add two polynomials using arrays. (10)

12. (a) Convert the given infix expression into postfix expression and explain the representation of stacks used for conversion. A $\uparrow$ B *C – D + E /(F + (G + H)) (5)

    (b) What is a circular Queue? Explain the need of taking an array of size one more than the size of Queue. (5)

13. Write a function to insert and delete the element in a sorted single linked list. (10)

14. (a) Consider an array of size N – 1 that contains all numbers except one. Design an algorithm that finds the missing number. (5)

    (b) What is BFS and DFS? Explain with an example. (5)

15. Consider the Hash function H(i) = (2i + 5) % 11 Insert the keys 3, 8, 102, 23, 4, 10, 9, 12, 44, 23 and construct the 11 item hash table by using Dynamic hashing. (10)

16. Construct a B-tree of order 5 by inserting the following items one by one. (10)

    C N G A H E K O M F W L T Z D P R

17. Write short notes on : (5+5)

    (a) Splay trees (b) Threaded Binary Trees

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