P5503

[5672]-202

F.Y. M.C.A. (Engineering) (Semester - II)

DATA STRUCTURE USING C AND C++

(2013 Pattern)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

1) Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10 and Q11 or Q12.

2) Neat diagrams must be drawn wherever necessary.

3) Figures to the right side indicate full marks.

4) Assume suitable data if necessary.

Q1) Explain what are data structures and its different types with example. **[8]**

OR

Q2) What is a sparse matrix? How to represent it in triplet format? Write a function for sparse matrix addition. **[8]**

Q3) a) Explain singly linked list data structure. Write C code to perform linked list insert operation on 3 different locations (First, middle, last). **[5]**

b) Explain difference between linked list and array data structures. **[4]**

OR

Q4) a) Explain doubly linked list data structure. Explain linked list delete operation at middle location in DLL with diagram. **[5]**

b) Explain different types of linked list with one application. **[4]**

Q5) a) Convert following infix expression into postfix **[4]**

$(X + Y)/(P * Q + R)$

b) What is linear queue? Explain its applications. **[4]**

OR

Q6) a) Explain processing of function call in the recursion with example. **[4]**

b) Explain with diagram circular queue representation using sequential and linked organization. **[4]**

Q7) a) Explain graph representation in adjacency matrix and adjacency list. **[4]**

b) Write and explain inorder tree traversal algorithm. **[4]**

OR

Q8) How to find minimum spanning tree in given graph? Explain with suitable algorithm. **[8]**

Q9) a) Explain working of linear search with proper example. Discuss time complexity. **[4]**

b) State the difference between bubble sorts and merge sort. **[4]**

OR

Q10) a) Write notes on :

    i)   Internal and external sorting

    ii) Sort order **[4]**

b) Write an algorithm for binary search. **[4]**

Q11) a) Explain methods of collision resolution. **[5]**

b) How chaining with and without replacement works? Explain with example. **[4]**

OR

Q12) a) Discuss advantages and disadvantages of sequential and direct access file organizations. **[5]**

b) What is linear probing? Explain with example. **[4]**

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