CS - 04

PGDCA/MCA (I YEAR)

Term-End Examination

December, 2008

CS - 04 : DATA STRUCTURES THROUGH "C" AND "PASCAL"

Time : 2 hours *Maximum Marks : 60*

00895

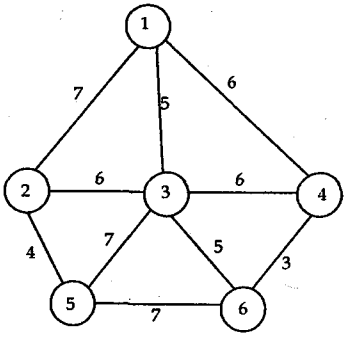
Note : *Question number* **1** *is* ***compulsory****. Answer any* ***three*** *questions from the rest. All algorithms should be written nearer to 'C' or 'PASCAL' Language.*

1. (a) Write Bubble sort algorithm. Show its operation on the following sequence of numbers : **10**

8, 21, 7, 18, 32, 17, 4, 12

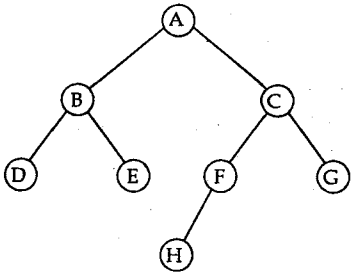
Arrange them in ascending order. Also find the number of swapping operations needed for this.

(b) What is the minimum cost spanning tree for the following graph ? **10**



Show all the intermediate steps.

(c) (i) Traverse the tree given below in Preorder, inorder and Postorder. **6**



(ii) Explain the advantages of a linked list over arrays. Also explain, how singly linked list differs from doubly linked list. **4**

2. (a) Evaluate the arithmetic expression $2*3-(4+5)$ using stack. Show the stack contents during the evaluation. **5**

(b) Define a circular queue. Write an algorithm to implement the insertion and deletion operations in a circular queue. 5

3. (a) Write a recursive function to find the Greatest Common Divisor (GCD) of two given numbers. 4

(b) What do you mean by AVL Tree. Draw the AVL Tree for following elements : 6

3, 5, 11, 8, 4, 10, 12, 7, 2, 6, 9

4. (a) Write an algorithm to read 'N' integers from the user and store them in a file called numbers.dat. Open the file in read-mode sum all the numbers and find its average. 6

(b) Write an algorithm to convert a decimal number to its hexadecimal equivalent. 4

5. Explain the following with an example : **4x2½=10**

(a) B - Tree

(b) Binary Search

(c) Sparse Matrix

(d) Priority Queue

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