Name _____ CS 102 - Quiz 4

This is a timed quiz. There are 6 questions and you have 40 minutes to complete the quiz. Submit your answers on blackboard. (35 points)

1) (2 points) A semiheap is a _____.
   a. table
   b. complete binary tree
   c. general tree
   d. full binary tree

2) (2 points) In an array-based implementation of a heap, the parent of the node in `items[i]` is always stored in _____.
   a. `items[i/2]`
   b. `items[(i-1)/2]`
   c. `items[i-2]`
   d. `items[(i-2)/2]`

3) (2 points) Which of the following is true about the heapsort?
   a. the heapsort does not require a second array
   b. the heapsort is more efficient than the mergesort in the worst case
   c. the heapsort is more efficient than the mergesort in the average case
   d. the heapsort is better than the quicksort in the average case

4) (2 points) _____ is a collision-resolution scheme that uses an array of linked lists as a hash table.
   a. Linear probing
   b. Double hashing
   c. Quadratic probing
   d. Separate chaining

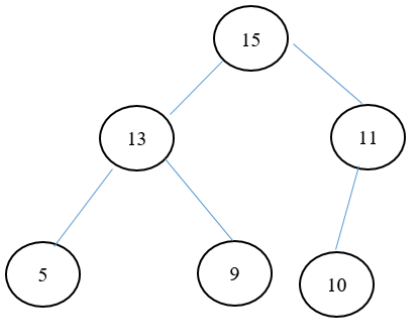
5) (12 points) Consider this heap H. show H after each intermediate step to perform the following operations (top to bottom)

   H.insert(7)

   H.insert(17);

   H.delete();

   H.delete();



6) (15 points) Consider an hashtable HT with a capacity of 11 items, the hash function hash

Private int hash1(int key) { return key % HT.size; }

Keys 0,1,8,9 are already in the table. Insert the following keys
HT.insert (52); HT.insert(44); HT.insert(56); HT.insert(53); HT.insert(61); HT.insert(64);

a. Suppose HT uses linear probing; show HT after performing all the insertions above (left to right).
b. Suppose HT uses quadratic probing; show HT after performing all the insertions above (left to right)
c. Suppose HT uses double hashing; show HT after performing all the insertions above (left to right).

Private int hash2(int key) { return 7 – (key % 7); }

0	0
1	1
2	
3	
4	
5	
6	
7	
8	8
9	9
10	