

Name _____

CSC-477/677: Algorithm Analysis
Fall 2014
Homework #4
Due on: *October 23, 2014*

Q1. Consider a queue of ten (10) integers Q implemented as an array. Assume that all the operators are properly implemented in C++. Show, by drawing figures, the appearance of the array after each statement in the code below is executed. Leave blank the part of the array unused by the queue. You should draw five figures.

```
initialize(Q);  
enqueue(Q,10);  
enqueue(Q,6);  
cout << dequeue(Q) << endl;  
enqueue(Q,4);
```

Q2. Create a binary search tree. Start with an empty tree, and insert the following elements, one at a time, in the following order:

Ann, Zak, Van, Bob, Ted, Dan, Sam, Fay, Nan, Max.

Draw the resulting tree.

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Q3. Consider a min-heap of letters as an array, as shown in class. Start with an empty heap, and perform the following operations:

Insert(G);

Insert(N);

Insert(B);

Insert(H);

Insert(M);

Insert(R);

Insert(V);

Insert(C);

DeleteMin;

DeleteMin;

DeleteMin;

What will the array be after those operations? Show the array at each step.

Hint: Consider the min-heap as a tree and determine the structure of the tree after each operation.

Then convert the tree into an array.