Computer Science I – Quiz – Sorting & Heaps
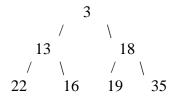
1) **(2pts)** What is the best case run time of Quick Sort?

2) **(2pts)** What is the worst case run time of Quick Sort?

3) **(2pts)** What is the best case run time of Merge Sort?

4) **(2pts)** What is the worst case run time of Merge Sort?

5) **(2pts)** What is the best case run time of Insertion Sort?

6) **(2pts)** What is the worst case run time of Insertion Sort?

7) **(3 pts)** Show the result of inserting the item 5 into the heap shown below:

```
            3
          /     \
        13        18
       /  \      /  \
     22    16  19    35
```

8) **(3 pts)** Show the result of removing the minimum element from the original heap in question #7 (without 5) from above.

9) **(2pts)** Show the array representation of the original heap from question #7.

10) **(Bonus 3pts)** Given the following specifications for a heap implementation, implement the heap sort
functions below.

```
struct heapStruct {

    int* heaparray;
    int capacity;
    int size;
};

struct heapStruct *initHeap();
struct heapStruct *heapify(int *values, int length);
void percolateDown(struct heapStruct *h, int index);
void percolateUp(struct heapStruct *h, int index);
void insert(struct heapStruct *h, int value);
int removeMin(struct heapStruct *h);

void sort(int values[], int length) {



}
```