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.

```c
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) {
}
```