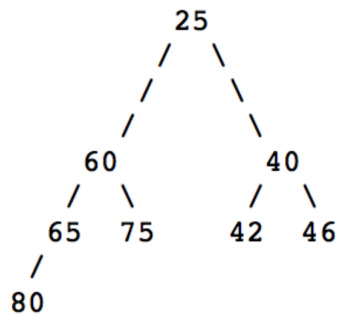**CS 300 Data Structures**
**Problem Set #19 – Priority Queue cont.**

1. Suppose that you insert 33 into the following heap. What does the heap look like after insertion?

```
        25
       /  \
      /    \
     /      \
    60       40
   /  \     /  \
  65  75   42  46
 /
80
```

2. Draw the binary heap that results from inserting 11, 9, 12, 14, 3, 15, 7

3. Please provide the final state of the binary max heap given below after inserting 71 to the heap.

| | 100 | 80 | 90 | 60 | 70 | 50 | 85 | 13 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

4. What is the minimum number of Item exchanges during a delete the maximum operation in a 15-element binary heap containing the keys 1–15.