2009 Paper 1 Question 6

1. In a min heap the parent of a node is always smaller than the node, and the children of a node are always larger.

The tree can be represented in an array. The root node of the tree is in the 0 position in an array. The left child of the root node is in the 1 position and right child 2 position.

The children’s postion of any particular node have this formula: left child 2i +1, right 2i + 2. (where i is the position of that node). The parent of any node have the positional formaula of (i- 1)/2. Where the answer is always rounded down.

1. The statement is always true as long as there are no repeated elements. Any array sorted in order is a min heap. For any position in an array i you expect any position <i to have elements smaller than positon i, and the opposite for larger than i.

Since the parent of an tree has a smaller element you expect it to have a smaller position value, which it does due to the formula suggested in the earlier question.

2007 Paper 10 Question 10