The complexity of a the Insertion Sort algorithm is:

Select one:

- a. Quadratic ✔
- b. Logarithmic
- c. Linear
- d. Exponential

Given the following recursive method, what is the result of m(5,5)?

```
public static int m(int a, int b) {
    if (b == 0) return 0;
    if (b % 2 == 0) return m(a+a, b/2);
    else return m(a+a, b/2) - a;
}
```

Select one:

- a. 0
- b. 10
- c. -25 ✔
- d. 25

When traversing a linked list with more than two nodes, how do we know if the node we are currently on (current) is the antepenultimate (third to last) node?

Select one:

- a. When current.getNext()==null returns true
- b. When current.getNext().getNext()==null returns true
- c. When current==null returns true
- d. When current.getNext().getNext().getNext()==null returns true ✔

In a binary search tree the following information is inserted sequentially, acting also as a key: Football, Baseball, Tennis, Water Polo, Basketball, Athletics, Hockey. What is the height of the resulting tree?

Select one:

- a. 7
- b. 3
- c. 4
- d. 2 ✔

Given the following recursive method, which calculates the height of a binary tree according to its recursive definition and with root the root of the tree, we can say that the type of recursion is:

```
public int height() {
    if (isEmpty()) {
        return -1;
    } else {
        return 1 +
            Math.max(root.getLeft().height(), root.getRight().height());
    }
}
```

Select one:

- a. Linear, tail recursion
- b. Non-linear, nested recursion
- c. Linear, non-tail recursion
- d. Non-linear, cascading recursion ✔

How many swaps are needed at least to sort the following array 5,3,4,1,2 from smallest to largest using Bubble Sort?

Select one:

- a. 9
- b. 6
- c. 10
- d. 8 ✔

The following method applied on a queue implemented with linked lists, with head pointing to the first element at the extraction end, and tail to the first element at the insertion end:

```
public void m(E info){
    Node n = new Node(info);
    if (isEmpty()) head = n;
    else tail.setNext(n);
    tail = n;
}
```

Select one:

- a. extracts the last inserted element without returning its information
- b. empties the queue
- c. inserts a new element into the queue at the extraction end of the queue
- d. inserts a new element in the queue by the insertion end ✔

The following elements are inserted into a heap (min-heap) sequentially (one by one) 4,6,3,2,1 and then the element with key 1 is extracted. What is the preorder path of the resulting heap?

Select one:

- a. 2,3,6,4 ✔
- b. 2,4,6,3
- c. 2,4,3,6
- d. 2,3,4,6

Which of the following operations is less efficient on linked lists than on arrays?

Select one:

- a. Accessing an element in an intermediate position of the array/list ✔
- b. Insertion of a new element at the beginning of the array/list
- c. Concatenation of two arrays/lists
- d. Extraction of the first element of the array/list

In a doubly linked list using dummy nodes (referenced by top and tail) and which is empty, the following condition applies:

Select one:

- a. tail.getPrev() is null
- b. tail and top point to the same node
- c. top.getNext() is null
- d. tail.getPrev() is top ✔