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1. Let `P` be a singly linked list. Let `Q` be the pointer to an arbitrary node `x` in the list. What is the tightest worst-case time complexity of the best known algorithm to delete the node `x` from the list, assuming that the list has sentinels?

A. [Your Answer] O(n)
B. O(log log n)
C. [Correct Answer] O(1)
D. O(log n)
E. O(n log n)

2. Consider a class `List` that is implemented using a singly linked list with only a `head` pointer (i.e. pointer to the first node in the list).

Given that implementation, which of the following operations could be implemented in O(1) time?

I. Insert item at the front of the list
II. Insert item at the rear of the list
III. Delete front item from list
IV. Delete rear item from list

A. I and II
B. [Your Answer] I, II and III
C. I, II and IV
D. All of them
E. [Correct Answer] I and III

3. Consider the following function definition and suppose that 1) the `node` class consists of an integer `data` element, and a `node` pointer called `next`, and 2) variable `head` is the address of a linked list of such `nodes`.

What does the function do?

```
void fun(node * curr) {
   if (curr != NULL) {
      fun(curr->next);
      cout << curr->data;
   }
}

node * head = NULL;
// maybe insert data into the chain here
fun(head);
```

A. `fun` segfaults on lists of odd length.
B. `fun` prints every other element of the list.
C. [Correct Answer] [Your Answer] `fun` prints the reverse of the list.
D. `fun` prints the elements of the list from `head` to the end.
E. None of the other options is correct.

4. In a sorted doubly linked list containing n nodes, the time taken to print out the 1st, 2nd, 4th, 8th, 16th, etc. elements is:

A. $O(n^2)$.
B. O(n log n).
C. [Correct Answer] [Your Answer] O(n).
D. O(log n).
E. O(1).

5. Which of the following List ADT implementations gives us an O(1) time for `insertAtEnd`, i.e inserting an element at the end of the list?

I. A singly-linked list with only a `head` pointer.
II. A singly-linked list with `head` and `tail` pointers.
III. A doubly-linked list with only a `head` pointer.
IV. A doubly-linked list with `head` and `tail` pointers.

A. [Your Answer] I, II, III and IV
B. I and III
C. I, III and IV
D. [Correct Answer] II and IV
E. None of the other options is correct