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1. Consider a class `List` that is implemented using a doubly linked list with `head` and `tail` pointers (i.e. pointers to the first and last nodes 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, II and IV
B. I, II and III
C. I and II
D. [Correct Answer] [Your Answer] All of them
E. I and III

2. Which of the following List ADT implementations gives us an O(1) time for `insertAtFront`, i.e inserting an element at the front 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 `tail` pointer.
IV. A doubly-linked list with `head` and `tail` pointers.

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

3. In a doubly linked list, what will be the time required to insert at the middle position of the list?

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

4. 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)
      cout << curr->data;
      if (curr->next != NULL) {
         fun(curr->next->next);
      }
}

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

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

5. In a singly linked list containing n nodes, the time required to find the maximum element is:

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