WIA1002/WIB1002 Data Structures

Tutorial: Linked List & Doubly Linked List

Question 1

```
1      public E xyz(int index,E e)
2      {
3         Node<E> current=head;
4         Node<E> temp;
5             if(index<0) return null;
6             else if(index>=size-1) {
7                  this.addLast(e);
8                  return null;
9             }
10             else if(index==0) {
11                  temp=head;
12                  head.element=e;
13                  return temp.element;
14            }else{
15                  for (int i = 1; i < index; i++) {
16                      current=current.next;
17                  }
18                  temp=current.next;
19                  current.next.element=e;
20                  return temp.element;
21            }

}
```

Given method xyz with 2 arguments:

a) Based on the above source code, explain what the lines of code do from line 10 – 21.
b) What is the main purpose of the method xyz()?
c) Modify above source code to make it concise and simpler

Question 2

```
1  else{
2       Node<E> temp = head;
3       for(int i=0; i<index; i++){
4       temp = temp.next;
5       }
6       element = temp.element;
7       temp.next.prev = temp.prev;
8       temp.prev.next = temp.next;
9       temp.next = null;
10      temp.prev = null;
11      size --;
12      }
```

Based on the source code above, assume the index given is 3

a) Explain what the lines of code do from line 2-11.
b) Draw the nodes for lines 7 - 10

Question 3

A doubly linked list keeps a set of characters. The head, the middle and the tail nodes respectively contains alphabet 'a', 'b' and 'c'. These nodes are in successive order. Create a new node that contains alphabet 'd'. Add this new node (contains alphabet d) at the last location of this linked list. Draw all of these nodes including their correct references.