**Question I: Choose the correct answer**

1. The Big O of accessing a vector item by index (where the number of elements of a vector is n) is:
   a. O( n )
   **b. O ( 1)**
   c. O ( n log n)
   d. O ($n^2$)

2. In linked lists, what is the advantage of iterators over index-based navigation?
   a. Iterators are easier to use.
   b. Index is error-prone.
   c. Iterators are more efficient.
   **d. Index is not defined on lists.**

3. In a singly linked list, the big O of searching for an item:
   **a. O( n )**
   b. O ( 1)
   c. O ( n log n)
   d. O ($n^2$)

4. Stacks can be implemented using:
   a. Vectors
   b. Singly linked lists
   **c. a + b**
   d. None of the above

5. One of the following is a realistic application of stacks.
   **a. Evaluating arithmetic expressions.**
   b. Waiting lists.
   c. Print jobs
   d. None of the above.

6. **(m-d)*a/b** is equivalent to the following expression in postfix.
   a. mdab-*/
   **b. md-a*b/**
   c. mda*-b/
   d. None of the above.

7. The big O of popping an item from a queue
   a. O( n )
   **b. O ( 1)**
   c. O ( n log n)
   d. O ($n^2$)

8. The advantage of using a circular-array based queue over a regular-array based queue is:
   a. A circular-array queue is more flexible.
   **b. A circular-array queue is more efficient.**
   c. A circular-array queue doesn't require allocating more capacity.
   d. b+c

9. A real application of queues is
   **a. Print jobs**
   b. Evaluating postfix expressions
   c. Databases
   d. None of the above

10. In the best case, the number of exchanges for selection sort is:
    a. O( n )
    **b. O ( 1)**
    c. O ( n log n)
    d. O ($n^2$)

11. In the worst case, the number of comparisons for bubble sort is:
    a. O( n )
    b. O ( 1)
    c. O ( n log n)
    **d. O ($n^2$)**

12. Which algorithm is best for sorting medium-sized arrays?
    **a. Shell sort**
    b. Bubble sort
    c. Insertion sort
    d. Selection sort

13. On average, which sorting algorithm has the least number of comparisons?
    **a. Merge sort**
    b. Bubble sort
    c. Shell sort
    d. Insertion sort

14. Which of the following sorting algorithms is **not** a quadratic sorting algorithm?
    a. Selection sort
    b. Bubble sort
    **c. Merge sort**
    d. Insertion sort

15. Which algorithm is particularly good for an array that is already sorted?
    a. Selection sort
    b. Quick sort.
    **c. Bubble sort**
    d. Merge Sort