Time Complexity

33. Show that $n^2 + 50n = O(n^2)$. True

34. Show that $n^2+n^2+n^2 = 3n^2 = O(n^3)$. False

Prove Your Answer

10. The running time complexity of a linear time algorithm is given as

(a) O(1) (b) O(n)

(c) O(n log n) (d) O(n²)

12. Which notation comprises a set of all functions h(n) that are greater than or equal to cg(n) for all values of $n \geq n_0$?

(a) Omega notation (b) Big O notation

(c) Small o notation (d) Theta Notation

25. $540n^2 + 10$ is in $\Omega(n^2)$.

Which one grows faster?

log(*N*) versus sqrt(*N*)

N^3 versus $10000*N^2$

$\log^2(N)$ versus $10*\log(N^5)$

Linked List

Multiple-choice Questions

1. A linked list is a
   (a) Random access structure
   (b) Sequential access structure
   (c) Both
   (d) None of these
2. An array is a
   (a) Random access structure
   (b) Sequential access structure
   (c) Both
   (d) None of these
3. Linked list is used to implement data structures like
   (a) Stacks (b) Queues
   (c) Trees (d) All of these
4. Which type of linked list contains a pointer to the next as well as the previous node in the sequence?
   (a) Singly linked list (b) Circular linked list
   (c) Doubly linked list (d) All of these
5. Which type of linked list does not store NULL in next field?
   (a) Singly linked list (b) Circular linked list
   (c) Doubly linked list (d) All of these
6. Which type of linked list stores the address of the header node in the next field of the last node?
   (a) Singly linked list
   (b) Circular linked list
   (c) Doubly linked list
   (d) Circular header linked list

True or False

1. A linked list is a linear collection of data elements. T
2. A linked list can grow and shrink during run time. T
3. A node in a linked list can point to only one node at a time. F
4. A node in a singly linked list can reference the previous node. F
5. A linked list can store only integer values. F
6. Linked list is a random access structure. F
7. Deleting a node from a doubly linked list is easier than deleting it from a singly linked list. T
8. Every node in a linked list contains an integer part and a pointer. F

Fill in the Blank and **Explain Your Answer**

2. The complexity to insert a node at the beginning of the linked list is O(1).

4. Inserting a node at the beginning of the doubly linked list needs to modify 2 pointers.

6. Inserting a node at the end of the circular linked list needs to modify 2 pointers.

8. Deleting a node from the beginning of the singly linked list needs to modify ___1___ pointers

10. Deleting a node from the end of a circular linked list needs to modify ___1___ pointers.

12. First node in the linked list is called the ___START___.

14. Overflow occurs when ___no free Memory to alloc___.