

Name:

CS483 - Quiz 1, Fall 2002

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1. Suppose that  $n$  reverse sorted values (in descending order) are provided as input to **Insertion Sort**. Compute the exact number of comparisons, that will be made for  $n = 5$ .

2. Prove that  $n^2 - 3n = \Theta(n^2)$  by giving suitable values of  $c_1, c_2$  and  $n_0$  and showing that they work.

3. How many leafs does a complete binary tree with height  $h$  have ?

4. What are the values for  $T(n)$  for the following recurrence for  $n = 8$  when  $T(1) = 2$  ?

$$T(n) = 3T\left(\frac{n}{2}\right) + 2n$$

5. What does **Heapify(A, i)** accomplish ?

6. Suppose that you have to sort  $n$  integers in range 0 to  $n^2 - 1$  in  $O(n)$  time. What algorithm would you use ?