In terms of $n$ (the total # of values to be sorted), how many levels of merges does the merge sort algorithm perform as discussed in class?

O( ________)

In terms of $n$ (the total # of values to be sorted), how many comparisons does the merge sort algorithm perform for all the merges across each individual level as discussed in class?

O( ________)

Match the associated recurrence relation with the algorithm description.

_____ recurses by dividing the resulting data in half and with each recursion performs operations not dependent on $n$ on just one half of the resulting data

_____ recurses on a slightly smaller set of data and with each recursion perform operations that are dependent on $n$

_____ recurses by dividing the resulting data in half and with each recursion performs operations not dependent on $n$ on both halves of the resulting data

_____ recurses on a slightly smaller set of data and with each recursion perform operations not dependent on $n$

_____ recurses by dividing the resulting data in half and with each recursion performs operations that are dependent on $n$ on both halves of the resulting data

Given the following binary tree

Specify the output for the following traversals

Preorder traversal: ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

Inorder traversal: ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

Postorder traversal: ____ ____ ____ ____ ____ ____ ____ ____ ____ ____
Construct a minimum spanning tree from the following network. Hint: 9 vertices so mst should have 8 edges.

What is the total weight of the minimum spanning tree? ______

Is there more than one minimum spanning tree in this graph (yes or no)? ______

Match the big-Oh run time complexity with the recurrence relation.

1) O( n log₂ n )   _____ T(n) = T(n-1) + O(1)
2) O( n² )   _____ T(n) = 2 T(n/2) + O(1)
3) O( 2ⁿ )   _____ T(n) = T(n/2) + O(1)
4) O( 1 )   _____ T(n) = T(n-1) + O(n)
5) O( log₂ n )   _____ T(n) = 2 T(n/2) + O(n)
6) O( n )
7) O( n! )

In the basic sequential search algorithm, knowing the probability that the target/key is in the data we are searching affects the big-Oh average case time complexity in terms of n how? _____

A) only affects the avg case if the target/key is in the data
B) only affects the avg case if the target/key is not in the data
C) affects the avg case time complexity no matter if the target/key is or is not in the data
D) does not affect the avg case time complexity
E) decreases or increases the avg case time complexity depending on the probability

Use the following letters for the next series of questions.

A) Ken Thompson    B) Dennis Ritchie    C) Brian Kernighan

_____ Coined the term Unix?
_____ Received Turing Award with Ken Thompson?
_____ Planted a Trojan horse in the C compiler to detect compiling login.c and the compiler itself?
_____ The father of the C programming language?
_____ Coauthor of the AWK programming language?
_____ Coauthor of the Go programming language?
_____ The father of grep?