

Name and Surname: \_\_\_\_\_

## Algorithms and Data Structures - Sample test

**Ex 1.** Choose the correct statement:

- A**□.  $2^{(\log n)^2} \in \Omega(2^n)$       **B**□.  $n^3 \in O(n^{1.5})$       **C**□.  $n \log n \in \Omega(n^{1.1})$       **D**□.  $n \in \Theta(4^{\frac{\log n}{2}})$

**Ex 2.** Starting from a Binary Search Tree containing 10 as the root and 20 as its right child, draw the BST obtained after inserting, in this order and without performing any balancing or rotation, values 12, 15, 6, 1, 8, 9.

Answer here

**Ex 3.** Describe algorithm **Merge Sort**, and prove its computational complexity.

Answer here

**Ex 4.** Which is the worst case complexity of inserting a new element into a Priority Queue implemented by a **heap**? Describe the insertion algorithm.

Answer here