

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

## Algorithms and Data Structures - Theory Exam 15 July 2020

Write answers clearly on separate sheets and send photos by clicking on the “Scansiona soluzione“ link on the left of the screen, or write answers in the white window below.

**Ex 1.** Choose all the correct statements (one or more are correct). When significant, logarithms are in base 2:

**A** ☐.  $2^{\frac{\log n}{2}} \in \Theta(n)$       **B** ☐.  $n^{2.5} \in O(n^3)$       **C** ☐.  $n(\log n)^3 \in \Omega(n^{1.1})$       **D** ☐.  $n^2 \in \Theta(4^{\frac{\log n}{2}})$

**Ex 2.** Starting from a Binary Search Tree containing 10 as the root, draw the BST obtained after inserting, in this order and without performing any balancing or rotation, values 1, 15, 6, 4, 20, 29, 23, 8. The final tree contains 9 values.

**Ex 3.** Describe the concept of Minimum Spanning Tree on an undirected graph, and the behaviour of Prim's algorithm.