Algorithms and Data Structures - Theory Exam - September 16, 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 the correct statements (there may be more than one correct answer).
When relevant, logarithms are in base 2:

A☐. $n\sqrt{n} \in \Omega(2^{2\log n})$ **B**☐. $n^3 \log^4 n \in O(n^{3.5})$
C☐. $n \log(n^3) \in O(n^{1.1})$ **D**☐. $n^2 \in \Theta(n^3)$

Ex 2. Describe **Quick sort** algorithm, and prove its complexity in the best case, worst case and average case.

Ex 3. Describe the concept of Single Source Shortest Path tree, and how it can be computed.