



**Politecnico di Milano**

# **Dipartimento di Elettronica, Informazione e Bioingegneria**

**prof. Fabrizio Ferrandi**

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## **Advanced Algorithms and Parallel Programming 1<sup>st</sup> part (Advanced Algorithms)–February 11<sup>th</sup> 2022**

**Polimi ID** \_\_\_\_\_

**Surname** \_\_\_\_\_ **Name** \_\_\_\_\_

- This is a closed-book examination. You cannot use computers, phones or laptops during the exam.
- Paper will be provided, but you should bring and use writing instruments that yield marks dark enough to be read easily. Erasable pens can be used.
- Total available time: 1h:00m.

**Exercise 1 (6 points)** \_\_\_\_\_

**Exercise 2 (5 points)** \_\_\_\_\_

**Exercise 3 (5 points)** \_\_\_\_\_

### Exercise n. 1

Describe how treap **Union** works.

## Exercise n. 2

Describe the Karger's Min-Cut Algorithm. Is the Karger's Min-Cut Algorithm a Monte Carlo randomization-based algorithm?

### **Exercise n. 3**

Discuss counting sort complexity. Why does counting sort matter in radix sort?