

Software Engineering
Sapienza Università di Roma

11 September 2020 – Duration 80 mins

- **Be concise and right to the point.** What you write should be understandable by a colleague of yours who just enrolled the MSc in Engineering in CS.

Question 1 (Containerization and micro-services) [15 mins]

- Present and discuss the concept of *containerization*, the differences/similarities with the concepts of virtualization and cloud computing, and the mostly adopted technologies
- Discuss the implications and relationships with the concept of *microservice*

Question 2 (Software architecture and SCRUM) [45 mins]

Assume you are the leading software engineer at *MySoft Inc.* and you are in charge of the analysis, design and realization of an application as **Immuni**. Immuni is the application developed by the Italian Government for contact tracing during COVID, and consists of the mobile app (for contact identification and user interaction) and a back-end where all data are collected, analysis are conducted, notification sent, etc. There is also a Web interface for healthcare operators in which they can insert the results of positive cases, etc.

- Design the architecture of the system as you envision it
- Assuming a total development time of 3 months, organize the software development life cycle in SCRUM

It is assumed you know Immuni, in case of doubts make your own assumptions, describe them and develop the exercise on the basis of such assumptions

Question 3 (Function Points and COCOMOII) [20 mins]

- Describe the method of Function Points for evaluating software development complexity. Provide all the basic notions and exemplify through examples, whenever possible and appropriate.
- Describe the method of cost and effort estimation commonly referred to as COCOMOII, by also discussing the relationships with Function Points