CM III Distributed Computing 2019/20
Coursework

Hand in by **06/03/2020 at 2pm** in DUO.

Partial credit for incomplete solutions may be given. Try to be as **precise and concise** as possible. Justify all answers.

1. Perform a precise analysis of the time complexity of the Flooding algorithm (slide set 1, slide 31), for

    (a) the synchronous model and **[10 marks]**

    (b) the asynchronous model. **[10 marks]**

2. Consider an anonymous ring (processors do not have unique identifiers that could be used by an algorithm) where processors start with binary inputs.

    (a) Give an argument that there is no uniform synchronous algorithm for computing the AND of the input bits. **[10 marks]**

    (b) Present an asynchronous (non-uniform) algorithm for computing the AND; the algorithm should send $O(n^2)$ messages in the worst case. **[10 marks]**

    (c) Present a synchronous algorithm for computing the AND; the algorithm should send $O(n)$ messages in the worst case. **[10 marks]**

Total number of marks: 50