

# Exercise sheet 4

Exercise group Boole

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**Task 1)****\_\_\_ /17p.**

1. *Medium Access Control (MAC)* is used to control which device receives or transmits when to prevent collisions and minimize power usage.
2. When using slotted ALOHA, interruptions can only happen when two senders decide to start transmitting at the same time, versus normal ALOHA, where interrupts can appear during the whole transmission duration. This not only reduces collision probability, but also reduces the amount of time colliding radio waves are “on air”.
3. *Preamble-Sampling* is the concept of prefacing every data transmission with a “preamble”, which spans the sampling period. This alleviates the need for synchronization. But this comes with increased cost for the sender, as the transmission duration is increased greatly. B-MAC uses this feature, X-MAC uses a different kind of preamble sampling.
4. receiver has to wait long before knowing if the message is for him. Sender has to wait a long time, even if target receiver is already listening. X-Mac solves this by sending the preamble in short bursts with the targets address in them. When the target receives them, it sends an ACK frame and the transmission begins.
5. In dense clusters, *cluster heads (CHs)* are chosen, which advertise themselves. Each node in the network chooses the CH with highest signal strength. Each CH then configures his own CDMA code and TDMA schedule. During operation it collects and aggregates data for the sink and updates it periodically, after a time the CHs are rotated.
- 6.

**Task 2)****\_\_\_ /9p.**

- 1.

**Total points:****\_\_\_ /26p.**