20 minutes

[L3] Quiz 3

Quiz covering Link layer: Error Control and Medium Access Control.

* This form will record your name, please fill your name.

1. [Error Control: Parity Checking] The following frames were received by a network node. After applying 2D parity checking, what was the conclusion?

	1	2	3	4	5	P
Frame 1:	1	0	1	0	1	1
Frame 2:	1	0	1	1	0	0
Frame 3:	0	1	1	1	0	1
Parity Frame:	0	0	1	1	1	1

(4 Points)

- ◯ There was no bit errors.
- ◯ A single bit error was detected; and correction is possible.
- ◯ Multiple bit errors were detected; and correction is possible.
- ◯ Multiple bit errors were detected; but correction is not possible.

2. [Error Control: Cyclic Redundancy Checking] If the generator is G=101, what are the redundancy bits R for data bits D=110? HINT: In the division operation, remember to shift the bits by r and to perform XOR at every step of the division process! (4 Points)

- ◯ 00
- ◯ 01
- ◯ 10
- ◯ 11

3. [MAC: Principles of Multiple Access] What is the main purpose of the MAC service/sublayer? (4 Points)

- ◯ To establish a logical channel between two nodes network
- ◯ To ensure reliable data transmission in the link layer
- ◯ To prevent collisions and manage access to the shared (broadcast) communication medium
- ◯ To encrypt data for secure communication in the link layer

4. [MAC: "Taking Turns" Protocols] What are the Token Passing Protocol limitations? (4 Points)

- ◯ Communication overhead due to additional token packet.
- ◯ Long delay while waiting for next transmission opportunity.
- ◯ If the token packet gets lost (e.g., dropped due to full queues, damaged due to noisy channel, etc.), the network crashes.
- ◯ All of the above

5. [MAC: Pure vs Slotted ALOHA] Regarding Pure ALOHA, which of the following options lists a correct reason why its performance is **worse** than Slotted ALOHA? (4 Points)

- ◯ Pure ALOHA has a much simpler implementation, which makes it idle most of the time.
- ◯ Pure ALOHA does not require synchronization (no notion of time slot), so nodes cannot find the right timing to transmit.
- ◯ In Pure ALOHA, nodes transmit whenever new frames arrive, which makes collisions more likely to happen.
- ◯ In Pure ALOHA, nodes cannot "listen" to the medium to check if other transmissions are taking place and avoid collisions.