ETTN15: Quiz Test 3
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1. If there is no data scheduled in a LTE FDD subframe (DL and UL) then:
   - ☐ The control region has no OFDM symbols assigned.
   - ☐ At least one OFDM symbol is assigned for the control part.
   - ☐ There is always data from eNodeB to UEs or vice versa.

2. LTE control signaling is transmitted at the beginning of a subframe. What would happen if it is transmitted at the end?
   - ☐ Nothing would change.
   - ☐ The latency to decode the data region would increase.
   - ☐ The data-rate may decrease.

3. How does the UE know the size of the LTE control region in the current subframe?
   - ☐ Because the UE detects when the data region starts.
   - ☐ It is indicated in the region control of the previous subframe.
   - ☐ By decoding part of the control information in the current subframe.

4. In order to decode PDCCH, the UE needs to know the modulation used, which is:
   - ☐ Indicated in the DCI.
   - ☐ QPSK.
   - ☐ Depend on the scenario.

5. The signal level received by the UE is really low and there is an error decoding the H-ARQ indication. Which of these scenarios is the worst?
   - ☐ eNodeB transmits an ACK and UE decodes NAK.
   - ☐ eNodeB transmits an NAK and UE decodes ACK.
   - ☐ None of the previous ones.

6. For a DCI, the UE has to:
   - ☐ Try to decode it only if the UE knows there is data for it in the data region of the subframe.
   - ☐ Attempt to decode different number of CCEs aggregations until it finds one for it.
   - ☐ Wait until a DCI is signaled to be present in current subframe, then it can decode it.

7. What is the main difference between SU-MIMO and MU-MIMO in the UL?
   - ☐ In SU-MIMO only one user can transmit in a cell at a certain time as opposite to MU-MIMO where several users can transmit at the same time.
   - ☐ MU-MIMO allows for multiple users to transmit in the same frequency-time resources, increasing the spectral efficiency.
   - ☐ In MU-MIMO the devices need to be more complex, requiring at least 2 antennas, as opposite to SU-MIMO where only one is needed.

8. The timing-advance:
   - ☐ Is determined by the UE according to DL measurements.
   - ☐ Is known by the UE the first time it access the network.
   - ☐ Is determined by the eNodeB based on UL measurements.

9. 15KHz and 60KHz are two available subcarrier spacing in a NR system. Which one is the best?:
   - ☐ 15KHz, because you can allocate more subcarriers in the same bandwidth.
   - ☐ 60KHz, because it produces shorter symbols, therefore the data-rate increases.
   - ☐ Depends on the scenario.

ETTN15: Quiz Test 3 (Answers)

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1. At least one OFDM symbol. Control region: 1-3 OFDM symbols. Control is needed in order to determine that there is no data scheduled.
2. The latency to decode the data region would increase.
3. By decoding part of the control information in the current subframe. It is encoded in the Physical Control Format Indicator Channel (PCFICH).
4. QPSK.
5. NAK-to-ACK. Needs RLC retransmission with associated delays.
6. Attempt to decode different number of CCEs.
7. MU-MIMO allows for multiple users to transmit in the same frequency-time resources.
8. Is determined by the eNodeB based on UL measurements.
9. Depends on the scenario.