

LTE MULTIPLE CHOICE QUESTIONS

1. Which organization is responsible for developing LTE standards?

- UMTS
- 3GPP
- 3GPP2
- ISO

Explanation: The 3rd Generation Partnership Project (3GPP) is collaboration between groups of telecommunications standards associations, known as the Organizational Partners. LTE (Long Term Evolution) introduced in 3GPP R8, is the access part of the Evolved Packet System (EPS).

2. Which UE category supports 64 QAM on the uplink?

- Only category 5
- Only category 4
- Only category 3
- Category 3,4 and 5

Explanation: Category information is used to allow the eNB to communicate effectively with all the UEs connected to it. The UE-category defines a combined uplink and downlink capability. Only UE category 5 supports 64 QAM on the uplink.

3. What type of handovers is supported by LTE?

- Hard handover only
- Soft handover only
- Hard and soft handover
- Hard, soft and softest handover

Explanation: LTE supports only hard handover. It does not receives data from two frequencies at the same time because switching between different carrier frequencies is very fast so soft handover is not required.

4. What is the minimum amount of RF spectrum needed for an FDD LTE radio channel?

- 1.4 MHz
- 2.8 MHz
- 5 MHz
- 20 MHz

Explanation: In telecommunication, Long-Term Evolution (LTE) is a standard for high-speed wireless communication for mobile devices and data terminals using

principles set by GSM/EDGE and UMTS/HSPA technologies. The minimum amount of RF spectrum needed for an FDD LTE radio channel is 2.8 MHz.

5. Which channel indicates the number of symbols used by the PDCCH?

- ☒ PHICH
- ☒ PDCCH
- ☒ PBCH
- ☒ PCFICH

Explanation: PCFICH channel indicates the number of symbols used by the PDCCH. The actual number of OFDM symbols occupied in any given subframe is indicated in the PCFICH (Physical Control Format Indicator Channel), which is located in the first OFDM symbol of each subframe.

6. How often can resources be allocated to the UE?

- ☒ Every symbol
- ☒ Every slot
- ☒ Every subframe
- ☒ Every frame

Explanation: Resources can be allocated to the UE every subframe. CCE Index is the CCE number at which the control channel data (PDCCH) is allocated. Normally this index changes for each subframe, i.e. even the same PDCCH data (e.g. a PDCCH for the same UE) allocated in each subframe changes subframe by subframe.

7. What is the largest channel bandwidth a UE is required to support in LTE?

- ☒ 10 MHz
- ☒ 20 MHz
- ☒ 32 MHz
- ☒ 5 MHz

Explanation: The LTE format was first proposed by NTT DoCoMo of Japan and has been adopted as the international standard. LTE-Advanced accommodates the geographically available spectrum for channels of 20 MHz.

8. In LTE, what is the benefit of PAPR reduction in the uplink?

- ☒ Improved uplink coverage
- ☒ Lower UE power consumption
- ☒ Reduced equalizer complexity
- ☒ Improved uplink coverage, lower UE power consumption and reduced equalizer

Explanation: PAPR is the relation between the maximum power of a sample in a given OFDM transmit symbol divided by the average power of that OFDM symbol.

PAPR reduction in the uplink leads to improved uplink coverage, lower UE power consumption and reduced equalizer complexity.

9. Which RLC mode adds the least amount of delay to user traffic?

- ☼ Unacknowledged mode (UM)
- ☼ Acknowledged mode (AM)
- ☼ Low latency mode (LM)
- ☼ **Transparent mode (TM)**

Explanation: The transparent mode entity in RLC does not add any overhead to the upper layer SDUs. The entity just transmits the SDUs coming from upper layer to MAC.

10. How much bandwidth is required to transmit the primary and secondary synchronization signals?

- ☼ **1.08 MHz**
- ☼ 1.4 MHz
- ☼ 930 kHz
- ☼ 20 MHz

Explanation: Cell synchronization is the very first step when UE wants to camp on any cell. 1.08 MHz is required to transmit the primary and secondary synchronization signals