

Chapter 2: Exercises for cellular networks (Solutions)

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1. What is the full term for ITU-R?

Solution: International Telecommunication Union - Radiocommunication Sector

2. What are the data rate requirements for 4G cellular network specified by ITU-R?

Solution: Up to $100Mbps$ for high mobility. Up to $1Gbps$ for low mobility.

3. What are the data rate requirements for 5G cellular network specified by ITU-R?

Solution: $20Gbps$ peak data rate. $1Gbps$ user experienced data rate.

4. Multiplexing

- (a) What is the multiplexing scheme used in AMPS?

Solution: FDM

- (b) What is the multiplexing scheme used in GSM?

Solution: FDM plus TDM

- (c) What is the multiplexing scheme used in CDMA?

Solution: CDM

5. What is the organization that specifies LTE standard?

Solution: 3GPP (3rd Generation Partnership Project)

6. Survey the following key technologies for 5G. Explain what it the main idea of the technology, and why it is important to 5G.

- (a) Network densification

- (b) millimeter wave

- (c) Massive MIMO