

**COMP4336/9336 Mobile data networking**  
**W8 Quiz: IoT and LoRa**

1. Which of the following layer in LoRa protocol stack is based on proprietary technology?
  - a) **PHY**
  - b) MAC
  - c) Network
  - d) Application
2. Duty cycle limit is imposed for LoRa end devices to
  - a) Save the energy cost of network servers
  - b) Save the energy cost of application servers
  - c) Save the energy cost of gateways
  - d) **Increase the capacity of LoRa networks**
3. LoRa gateways can decode the signals even if the received power is below the noise floor because
  - a) LoRa gateways are produced from novel materials with exceptional electromagnetic properties
  - b) LoRa uses ultra-wide bandwidth channels
  - c) **LoRa spreads the signal over a much wider bandwidth as well as transmits at a lower power**
  - d) LoRa uses half-duplex communication
4. For a 500kHz channel, the frequency sweeping rate of a LoRa transmitter configured with SF=7 can exceed
  - a) **1 GHz/s**
  - b) 2 GHz/s
  - c) 3 GHz/s
  - d) 4 GHz/s
5. For a 125kHz channel, a LoRa transmitter configured with SF=8 can send
  - a) ~1024 sym/s
  - b) ~512 sym/s
  - c) **~488 sym/s**
  - d) ~390 sym/s
6. Which of the following statements is incorrect?
  - a) Header is optional in LoRa packets
  - b) CRC is optional in LoRa packets
  - c) **LoRa gateways are responsible for medium access control**
  - d) LoRa network server is responsible for medium access control
  - e) None of these

7. Which of the following statements is correct?

- a) Each LoRa chirp represents one or more symbols
- b) Upchirps and downchirps are often mixed in a given LoRa payload
- c) **LoRa preamble contains both upchirps and downchirps**
- d) In LoRa chirps, frequency increases exponentially
- e) LoRa chirps always start from the lowest frequency of the channel

8. If SF is downgraded from 12 to 10,

- a) Symbol duration is increased by a factor of 2
- b) **Symbol duration is decreased by a factor of 4**
- c) Data rate is increased by a factor of 2
- d) Data rate is increased by a factor of 4
- e) Frequency sweeping speed is increased by a factor of 2

9. If SF is upgraded from 7 to 10,

- a) **Symbol duration is increased by a factor of 8**
- b) Power consumption of the client device is reduced significantly
- c) Message air time is reduced significantly
- d) Data rate is increased by a factor of 8
- e) Data rate is decre

10. If there are thr

- a) Only the gateway closest to the device would process the packet
- b) **All three gateways would process the packet**
- c) All three gateways would transmit the ACK packet
- d) Only the gateway farthest from the device would transmit an ACK packet for this device
- e) The gateways would coordinate to decide which gateway should act as the real gateway at any given time

**End of W8 Quiz**