

IO4041 Introduction to Internet of Things – BCS Spring 2025 – Quiz 2

Roll # _____ Name _____ Section _____

1. What is the maximum data rate of Zigbee under IEEE 802.15.4?
 - a) 10 Mbps
 - b) 250 kbps
 - c) 100 bps
 - d) 1 Mbps

2. Which type of Zigbee device has the lowest power consumption?
 - a) Zigbee Coordinator (ZC)
 - b) Zigbee Router (ZR)
 - c) Zigbee End Device (ZED)
 - d) All devices consume the same power

3. How does IEEE 802.15.4 achieve low power consumption?
 - a) By continuously transmitting data
 - b) By using high-frequency transmissions
 - c) By employing low-duty cycle communication
 - d) By using a fixed transmission power at all times

4. What is the primary benefit of Z-Wave's mesh network topology?
 - a) It increases network bandwidth
 - b) It allows data transmission without a controller
 - c) It extends communication range through intermediate nodes
 - d) It eliminates the need for routing tables

5. What is the purpose of the 'Healing' process in Z-Wave?
 - a) To reset the entire network
 - b) To remove failed devices from the network
 - c) To update routing information when the network changes
 - d) To assign new Node IDs dynamically

6. Which type of Z-Wave device is responsible for setting up the network?

- a) Slave device
- b) Secondary controller
- c) Bridge
- d) None of the above

7. Which of the following is an advantage of passive RFID tags?

- a) Long transmission range
- b) No need for an external power source
- c) Higher data transfer rate than active tags
- d) Can operate at multiple frequencies simultaneously

8. What is the main difference between RFID and NFC?

- a) NFC requires direct contact, while RFID does not
- b) NFC operates at longer distances than RFID
- c) RFID is only used for payments, while NFC is for logistics
- d) NFC works at 13.56 MHz, while RFID operates at multiple frequencies

9. What is the standard frequency range for Bluetooth?

- a) 868 MHz – 915 MHz
- b) 2.4 GHz – 2.4835 GHz
- c) 5 GHz – 5.8 GHz
- d) 13.56 MHz

10. Which organization manages Bluetooth standardization?

- a) IEEE
- b) Zigbee Alliance
- c) Wi-Fi Alliance
- d) None of the above

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1. What is the typical transmission range of Zigbee indoors?
 - a) 1 km
 - b) 10-75 meters
 - c) 500 meters
 - d) 5 kilometers

2. Which Zigbee network topology provides the highest level of fault tolerance?
 - a) Star topology
 - b) Tree topology
 - c) Mesh topology
 - d) Bus topology

3. What is the role of the Zigbee Device Object (ZDO) in the protocol stack?
 - a) Handles encryption and authentication
 - b) Manages device roles, discovery, and binding
 - c) Controls the physical and data link layers
 - d) Determines the frequency-hopping sequence

4. What is the maximum number of hops a Z-Wave network allows in routing?
 - a) 1
 - b) 2
 - c) 4
 - d) 8

5. Which of the following can never be a use case of Z-Wave?
 - a) Smart home automation
 - b) Industrial machine-to-machine communication
 - c) High-speed internet access
 - d) Remote-controlled lighting

6. How does Z-Wave prevent interference from other wireless technologies?

- a) By operating in the 2.4 GHz band
- b) By using adaptive frequency hopping
- c) By operating in a sub-GHz frequency range
- d) By using a fixed, single transmission frequency

7. Which RFID frequency band is most suitable for long-range applications?

- a) Low-frequency (LF)
- b) High-frequency (HF)
- c) Ultra-high-frequency (UHF)
- d) Near-field frequency (NFF)

8. In which NFC mode can a smartphone act like a contactless credit card?

- a) Peer-to-peer mode
- b) Read/write mode
- c) Card emulation mode
- d) Passive mode

9. Which of the following is true about Bluetooth scatternets?

- a) A device can be a master in multiple piconets
- b) A device can be a master in one piconet and a slave in another
- c) Only one piconet can exist at a time
- d) Piconets cannot interconnect

10. Which Bluetooth mechanism reduces interference in the 2.4 GHz band?

- a) Carrier Sense Multiple Access (CSMA)
- b) Adaptive Frequency Hopping (AFH)
- c) Time Division Multiple Access (TDMA)
- d) Frequency Division Multiplexing (FDM)