

# 5.4.15 Lesson Review

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Time Spent: 30:15

Score: 90%

Passing Score: 80%



## Question 1

✓ Correct

What does a high Signal-to-Noise Ratio (SNR) indicate in a wireless network?

- ☐ Low data transmission speed across the network
- ☐ Higher noise levels that interfere with the signal
- ☐ Increased power output from the Wi-Fi device
- ☒ Stronger signal compared to background noise ✓ Correct

### Explanation

A high Signal-to-Noise Ratio (SNR) means the signal is significantly stronger than the background noise, leading to better network performance. Higher noise levels would result in a lower SNR, not a higher one. SNR does not reflect power output or directly relate to data speed but impacts the quality and reliability of the connection.

### Related Content



5.4.10 Wi-Fi Analyzers

resources\questions\q\_wire\_net\_wifi\_snr.question.xml

## Question 2

✓ Correct

What is Bluetooth Low Energy (BLE) primarily designed for?

- ☐ Large file transfers between computers and mobile devices
- ☐ Enabling backward compatibility with all previous Bluetooth versions
- ☒ Small battery-powered devices that transmit small amounts of data infrequently ✓ Correct
- ☐ Continuous streaming of high-definition video content

**Explanation**

Bluetooth Low Energy (BLE) is designed specifically for small battery-powered devices, transmitting small amounts of data occasionally to conserve power. BLE is not intended for continuous high-bandwidth applications like video streaming or large file transfers. BLE is not backward compatible with classic Bluetooth, although some devices can support both BLE and classic Bluetooth simultaneously.

**Related Content**

5.4.12 Bluetooth, RFID, and NFC

resources\questions\q\_wire\_net\_ble\_purpose.question.xml

## Question 3

✓ Correct

A network technician is upgrading a grocery store's checkout lines with contactless payment devices. What type of wireless technology are the payment devices based on?

☒ NFC ✓ Correct

☐ 802.11a

☐ Bluetooth

☐ RFID

**Explanation**

NFC (Near Field Communication) is a wireless technology used in contactless payment systems. It enables secure, short-range communication between devices, such as payment terminals and contactless cards or smartphones, typically within a range of a few centimeters. 802.11a is a Wi-Fi standard used for wireless networking, not typically for secure, short-range communication required in contactless payments. Bluetooth is a wireless technology for short-range communication, but it is generally used for pairing devices over a slightly longer range than NFC and is not specifically optimized for secure contactless payments. While RFID (Radio Frequency Identification) is used for short-range identification and can sometimes be used in payment systems, NFC is specifically designed for secure, close proximity communication and is the primary technology in contactless payment systems.

**Related Content**

5.4.12 Bluetooth, RFID, and NFC

resources\questions\q\_wire\_net\_contactless\_payment.question.xml

## Question 4

✓ Correct

A network technician is upgrading the wireless network so that it can take advantage of "multiple input multiple output" (MIMO) to increase reliability and bandwidth. What standard is the technician upgrading the wireless network to?

☒ 802.11n ✓ Correct

☐ 802.11g

☐ 802.11a

☐ 802.11b

**Explanation**

802.11n was the first Wi-Fi standard to introduce MIMO (Multiple Input Multiple Output) technology, which allows multiple antennas to transmit and receive data simultaneously. This increases the network's reliability, range, and bandwidth, making it suitable for environments that require enhanced performance.

802.11g is an older standard that does not support MIMO.


It operates at 2.4 GHz and offers lower speeds and ranges compared to 802.11n. 802.11b is one of the earliest Wi-Fi standards and does not support MIMO. It has a limited range and operates at slower speeds.


802.11a operates at 5 GHz and offers higher speeds than 802.11b and 802.11g, but it does not support MIMO. It is primarily used for specific business applications requiring the 5 GHz band without MIMO capability.


**Related Content**

 5.4.3 IEEE 802.11a

 5.4.4 IEEE 802.11b/g

 5.4.5 802.11n

 5.4.7 Wi-Fi 5 and Wi-Fi 6

 5.4.8 Wi-Fi 7 (802.11be)

resources\questions\q\_wire\_net\_mimo\_upgrade.question.xml

## Question 5

✓ Correct

What is the primary purpose of a Wi-Fi analyzer?

- ☐ To create new wireless access points automatically
- ☒ To measure signal strength and troubleshoot performance issues ✓ Correct
- ☐ To reduce noise levels in wireless networks
- ☐ To boost the signal strength of wireless networks

**Explanation**

A Wi-Fi analyzer is used to measure the signal strength of various networks and troubleshoot performance issues, helping to identify optimal channel configurations. It does not boost signals, create new access points, or directly reduce noise; rather, it analyzes existing conditions to assist in optimizing network performance.

**Related Content**

5.4.10 Wi-Fi Analyzers

resources\questions\q\_wire\_net\_wifi\_analyzer\_purpose.question.xml

## Question 6

✔ Correct

Which of the following wireless networking standards uses a frequency of 5 GHz and supports data transmission speeds up to 2.6 Gbps?

- ☐ 802.11a
- ☐ 802.11b
- ☐ 802.11g
- ☒ 802.11ac ✓ Correct
- ☐ 802.11n

**Explanation**






The 802.11ac standard uses the 5 GHz frequency and supports data transmission speeds up to 2.6 Gbps.

802.11g and 802.11a both support data transmission speeds up to 54 Mbps.

802.11b supports data transmission speeds up to 11 Mbps.

802.11n supports data transmission speeds up to 600 Mbps.

**Related Content**

-  5.4.3 IEEE 802.11a
-  5.4.4 IEEE 802.11b/g
-  5.4.5 802.11n
-  5.4.7 Wi-Fi 5 and Wi-Fi 6
-  5.4.8 Wi-Fi 7 (802.11be)

resources\questions\q\_wire\_net\_80211ac\_freq\_trans\_speed\_pp7.question.xml

## Question 7

✔ Correct

Which of the following are characteristics of the 802.11g wireless standard? (Select three.)

- ☐ Operates in the 5.75 GHz range
- ☒ Maximum bandwidth of 54 Mbps ✔ Correct
- ☒ Operates in the 2.4 GHz range ✔ Correct
- ☐ Maximum bandwidth of 11 Mbps
- ☒ Backward compatible with 802.11b devices ✔ Correct
- ☐ Backward compatible with 802.11a devices






**Explanation**

802.11g wireless networks:

- Operate in the 2.4 GHz range.
- Have a maximum bandwidth of 54 Mbps.
- Are backward compatible with 802.11b networks.

802.11b provides 11 Mbps of bandwidth. 802.11a operates in the 5.75 GHz range. For this reason, 802.11a is not compatible with 802.11b or 802.11g.

**Related Content**

-  5.4.3 IEEE 802.11a
-  5.4.4 IEEE 802.11b/g
-  5.4.5 802.11n
-  5.4.7 Wi-Fi 5 and Wi-Fi 6
-  5.4.8 Wi-Fi 7 (802.11be)

resources\questions\q\_wire\_net\_80211g\_char\_pp7.question.xml

## Question 8

✕ Incorrect

Which dBm value is the most realistic and indicates a strong wireless signal in a typical environment?

☐ -90 dBm

☒ -30 dBm ✕ Incorrect

☐ -80 dBm

☐ -65 dBm ✓ Correct

**Explanation**

-65 dBm is generally considered a strong wireless signal, suitable for reliable connectivity. A value of -90 dBm or -80 dBm is weaker and likely to result in packet loss or disconnections. A value of -30 dBm is extremely strong, but -65 dBm is typically the threshold for good performance in common wireless.

**Related Content**

5.4.10 Wi-Fi Analyzers

resources\questions\q\_wire\_net\_wifi\_dbm\_values.question.xml



## Question 9

✓ Correct

How do adapters supporting Bluetooth versions 3 and 4 achieve faster data transfer rates?

- ☒ By negotiating an 802.11 radio link for large file transfers ✓ Correct
- ☐ By using infrared technology for improved connectivity
- ☐ By increasing the Bluetooth signal range
- ☐ By doubling the Bluetooth frequency to enhance speed

**Explanation**

Adapters supporting Bluetooth versions 3 and 4 can achieve faster data transfer rates by negotiating an 802.11 radio link, which allows for higher speeds when transferring large files. Increasing signal range does not directly impact speed, and Bluetooth does not use infrared technology. Doubling the frequency is not a method used to increase speed in Bluetooth connections.

**Related Content**

5.4.12 Bluetooth, RFID, and NFC

resources\questions\q\_wire\_net\_bluetooth\_3-4\_data\_transfer.question.xml

## Question 10

✓ Correct

What feature of Bluetooth allows two devices to securely exchange data?

- ☒ Pairing procedure that authenticates devices before communication ✓ Correct
- ☐ Encrypted data stored in the device's internal memory
- ☐ Only allowing communication between identical device types
- ☐ Use of physical cables between devices

**Explanation**

Bluetooth devices use a pairing procedure to authenticate each other, ensuring a secure connection before data exchange. Bluetooth connections are wireless, not requiring physical cables, and the pairing process rather than memory encryption is what ensures secure data exchange. Bluetooth can connect different types of devices, not just identical ones.

**Related Content**

5.4.12 Bluetooth, RFID, and NFC

resources\questions\q\_wire\_net\_bluetooth\_secure\_exchange.question.xml

## Question 11

✓ Correct

What distinguishes NFC from RFID technology?

- ☐ NFC and RFID are both designed for long-range communication.
- ☐ NFC is used for tracking parcels over long distances.
- ☒ NFC operates at very short ranges and can function as both tag and reader. ✓ Correct
- ☐ RFID is primarily used for contactless payments, while NFC is used for high-speed data transfer.

**Explanation**

NFC operates at short ranges (typically up to two inches) and can act as both a tag and a reader, enabling peer-to-peer communication, which is suitable for contactless payments and quick data exchanges. RFID is primarily used for tracking and inventory over longer distances. RFID is less common for contactless payments, and neither technology is intended for high-speed or long-range data transfer.

**Related Content**

5.4.12 Bluetooth, RFID, and NFC

resources\questions\q\_wire\_net\_nfc\_rfid.question.xml

## Question 12

— Partial

Which of the following technologies does the 802.11ac wireless networking standard use to provide increased bandwidth and communication speeds? (Select two.)

☒ Channel bonding to combine more channels in the 5 GHz band to allow more than double the bandwidth ✓ Correct

☐ MU-MIMO to allow multiple users to access the same channel ✓ Correct

☐ Dual-band transmission to allow data to be transmitted at two frequencies at the same time

☐ Peer-to-peer mode to allow each host to communicate directly with other hosts

☒ OFDM modulation to allow several parallel data channels to stream data ✗ Incorrect

**Explanation**

The 802.11ac wireless network standard increases bandwidth and communication speeds using the following technologies:


- MU-MIMO is an enhancement to MIMO that allows multiple users to use the same channel. In addition to adding MU-MIMO, 802.11ac doubled the number of MIMO radio streams from four to eight.
- Channel bonding combines two non-overlapping 20 MHz channels into a single 40 MHz channel, resulting in slightly more than double the bandwidth.


All the other technologies are not used to increase the bandwidth and communication speeds for 801.11ac.


**Related Content**

 5.4.3 IEEE 802.11a

 5.4.4 IEEE 802.11b/g

 5.4.5 802.11n

 5.4.7 Wi-Fi 5 and Wi-Fi 6

 5.4.8 Wi-Fi 7 (802.11be)

## Question 13


✓ Correct

An organization located on a large piece of rural property needs to connect its office building on the north side of the property with its warehouse and shipping operation on the south side of the property. The organization decides to connect the locations using long-range fixed wireless. What frequency spectrum must the organization use to ensure that nobody else can use the same frequency band?

- ☐ 802.11ax
- ☒ Licensed ✓ Correct
- ☐ Unlicensed
- ☐ DFS

**Explanation**

A licensed frequency spectrum provides exclusive access to a specific frequency band, ensuring that no other entities can use the same frequency in the area. This is especially useful for long-range, fixed wireless connections in rural areas where dedicated, interference-free communication is essential for reliable operation between distant locations. Unlicensed frequencies, such as the 2.4 GHz and 5 GHz bands, are open for public use, meaning that other organizations or individuals could potentially operate on the same frequencies, leading to interference and unreliable communication. 802.11ax (Wi-Fi 6) is a Wi-Fi standard, not a frequency spectrum type. It typically operates in unlicensed bands and is designed for high-density, short- to medium-range wireless networks, not long-range fixed wireless connections. DFS is a mechanism that allows Wi-Fi devices to avoid interference with radar systems by automatically selecting channels within the 5 GHz band. However, it does not provide exclusive access to frequencies, so other users could still be present on the same frequencies.

**Related Content** 5.4.2 Frequency Bands 5.4.11 Long-Range Fixed Wireless

resources\questions\q\_wire\_net\_frequency\_spectrum.question.xml

## Question 14

✔ Correct

What is the advantage of using the same SSID for both frequency bands on a dual-band access point?

- ☐ It restricts users to manual selection of the frequency band.
- ☐ It prevents interference from nearby networks.
- ☒ It allows devices to automatically connect to the band with the strongest signal. ✓ Correct
- ☐ It forces devices to use only the 2.4 GHz band.

**Explanation**

Using the same SSID for both bands allows devices to automatically connect to the band with the strongest signal, improving connectivity and simplifying network selection for the user. Forcing devices to a specific band or requiring manual selection would limit flexibility. Using the same SSID does not inherently reduce interference from nearby networks, which is managed through channel configuration.

**Related Content**

5.4.9 Wireless LAN Installation Considerations

resources\questions\q\_wire\_net\_wifi\_dual\_band\_ssid.question.xml

## Question 15

✔ Correct

Which IEEE wireless standards specify transmission speeds up to 54 Mbps? (Select two.)

☒ 802.11a ✔ Correct

☒ 802.11g ✔ Correct

☐ 802.11b

☐ Bluetooth

☐ 802.11ac

**Explanation**

Both the 802.11a and the 802.11g wireless standards specify maximum transmission speeds up to 54 Mbps.

Bluetooth is a wireless standard that is commonly used to connect peripheral devices and operates at 720 Kbps.


The 802.11b wireless standard provides transmission speeds of 11 Mbps.


The 802.11ac wireless standard provides transmission speeds of up to 2.6 Gbps.


**Related Content**

 5.4.3 IEEE 802.11a

 5.4.4 IEEE 802.11b/g

 5.4.5 802.11n

 5.4.7 Wi-Fi 5 and Wi-Fi 6

 5.4.8 Wi-Fi 7 (802.11be)

resources\questions\q\_wire\_net\_80211a\_80211g\_54\_mbps\_pp7.question.xml