Chapter 17: Quiz – Wireless Signals and Modulation (Answers) CCNPv8 ENCOR

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1. When are two wireless signals said to be in phase?

- when two identical signals are produced and one signal is slightly delayed from the other
- when two identical signals are produced exactly at the same time and their cycles vary slightly
- **when two identical signals are produced exactly at the same time and their cycles match up**
- when two different signals are produced and one signal is slightly delayed from the other

Explanation: Signals that are in phase, described as two identical signals that are produced exactly at the same time with matching cycles, tend to add together whereas signals out of phase cancel each other out.

2. What two IEEE 802.11 wireless standards operate only in the 5 GHz range? (Choose two.)

- **802.11a**
- 802.11b
- 802.11g
- 802.11n
- **802.11ac**
- 802.11ad

Explanation: The 802.11a and 802.11ac standards operate only in the 5 GHZ range. The 802.11b and 802.11g standards operate only in the 2.4 GHz range. The 802.11n standard operates in both the 2.4 and 5 GHz ranges. The 802.11ad standard operates in the 2.4, 5, and 60 GHz ranges.

3. A wireless engineer is comparing wireless survey scans from the previous network engineer and finds a report of RSSI values. Which RSSI value indicates the strongest signal power level?

- 0
- 1
- **255**

- 256

Explanation: The received signal strength indicator (RSSI) scale uses relative values ranging from 0 to 255, where 0 is the weakest and 255 is the strongest.

4. Which MIMO device supports three spatial streams with two receivers and three transmitters?

- 3×3:3 device
- **3×2:3 device**
- 2×3:3 device
- 2×3:2 device

Explanation: The number of spatial streams supported by a device is designated by a colon and a number being added to the MIMO radio specification of TxR. Three transmitters and two receivers would be displayed as 3×2, followed by the addition of three spatial streams to display as 3×2:3.

5. How is a wavelength commonly described as the signal moves through free space?

- A wavelength is the measure of the number of times the signal makes one complete up and down cycle in a single second.
- A wavelength is the measure of shift in time relative to the start of a cycle.
- **A wavelength is the measure of the physical distance that a wave travels over one complete cycle.**
- A wavelength is the measure of the complete RF signal as it spills above and below a center frequency.

Explanation: The wavelength of an RF signal is designated by the Greek symbol lambda and is a measure of the physical distance that a wave travels over one complete cycle.

6. How is the frequency of a wave measured?

- the number of seconds the signal takes to complete one up and down cycle
- **the number of times the signal makes one complete up and down cycle in 1 second**
- the number of times the signal makes one complete up and down cycle in 2 seconds
- the number of seconds the signal takes to complete two up and down cycles

Explanation: The frequency of a wave is measured by counting the number of times the signal makes one complete up and down cycle in a single second.

7. How will a wireless device use dynamic rate shifting to maintain data integrity as a mobile user moves farther and farther away from the wireless transmitter?

- **The wireless device will use a lower data rate.**
- The wireless device will use an increased data rate.
- The wireless device will use maximal-ratio combining.
- The wireless device will use transmit beamforming.

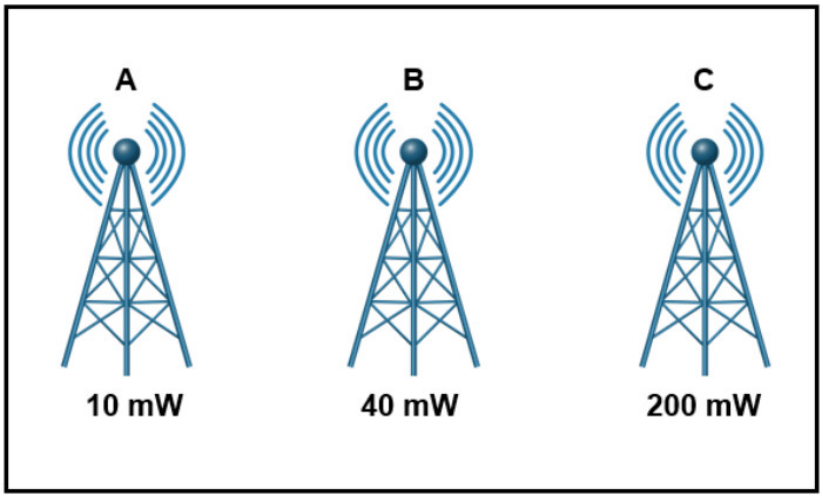
Explanation: Dynamic rate shifting will maintain the integrity of data by triggering a shift to a less complex modulation and coding scheme, which will also result in a lower data rate between the wireless device and distancing mobile user.

8. Which three attributes can be altered to indicate that information is being carried over an RF signal? (Choose three.)

- channel width
- **frequency**
- **amplitude**
- **phase**
- channel spacing
- wave propagation

Explanation: Frequency, phase, and amplitude are the three attributes that can be altered when indicating that information is being carried on an RF signal.

9. Refer to the exhibit. It displays the sources of A, B, and C and the corresponding absolute power of each. In comparing source A and B, how much greater is the signal strength of source B than the strength of A?



- 3 dB
- 4 dB

- **6 dB**
- 30 dB

Explanation: Source B is four times the value of source A. Each time you double a value, simply add 3 dB. If you double source A from 10 mW to 20 mW you add 3 dB. If you double 20 mW to 40 mW you now add an additional 3 dB. Add the first 3 dB to the second 3 dB and you can conclude that the signal strength of source B is 6 dB greater than source A.

10. How is the strength or amplitude of an RF signal measured?

- **It is measured by the height from the top peak to the bottom peak of the waveform of a signal.**
- It is measured by the number of times the signal makes one complete up and down cycle in a single second.
- It is measured from the center of one peak to the center of the next peak.
- It is measured by the physical distance that a wave travels over one complete cycle.

Explanation: The amplitude or strength of an RF signal is measured in the height from the top peak to the bottom peak of the waveform of a signal.

11. How can an 802.11ac wireless device use transmit beamforming to more efficiently reach a client location?

- The same signal can be provided to each transmitting antenna with a slight alteration to the phase of the signal so that the resulting signals will all arrive out of phase at the receiver.
- **The same signal can be provided to each transmitting antenna with a slight alteration to the phase of the signal so that the resulting signals will all arrive in phase at the receiver.**
- A different signal can be provided to each transmitting antenna with a slight alteration to the phase of the signal so that the resulting signals will all arrive in phase at the receiver.
- A diferent signal can be provided to each transmitting antenna with a slight alteration to the phase of the signal so that the resulting signals will all arrive out of phase at the receiver.

Explanation: When the same signal is provided to each transmitting antenna with a slight alteration to the phase of the signal, this will result in the signals arriving in phase at the receiver. These in phase signals will have a constructive effect and improve the signal quality and signal-to-noise ratio.

12. A wireless engineer is deploying wireless network devices and client devices that support both 2.4 GHz and 5 GHz transmitters. Which concern should the wireless engineer consider in the deployment of this technology?

- **The 5 GHz band will suffer from a greater free space path loss than the 2.4 GHz band.**
- The 2.4 GHz band will require additional EIRP to match the range of the 5 GHz band.
- The 2.4 GHz band will suffer from a greater free space path loss than the 5 GHz band.
- The 5 GHz band will suffer from free space path loss only while transmitting a signal roughly 3 meters or further from an antenna.

Explanation: Free space path loss can be measured even at 1 meter away from an antenna and is greater in the 5 GHz band than in the 2.4 GHz band.