Name _____ Date _____

Module 12 - WLAN Concepts

Switching, Routing, and Wireless Essentials – Semester 2

Student Version

Module 12 Sections:

12.0 Introduction
12.1 Introduction to Wireless
12.2 Components of WLANs
12.3 WLAN Operation
12.4 CAPWAP Operation
12.5 Channel Management .
12.6 WLAN Threats
12.7 Secure WLANs
12.8 Module Practice and Quiz

Required Materials:

Reading Organizer

Packet Tracer Activities: None

Labs: None

Module's 5 - 6 Exam

Page intentionally left blank.

Points_____ / ___195___

Name_____ Date _____

Module 12 - WLAN Concepts
Reading Organizer
Student Version

Note: The Reading Organizer has weighted scoring. Any question with the word **explain**, **define, or describe** in it is expected to have a longer answer and is worth two points each.

After completion of this module, you should be able to:

- Describe WLAN technology and standards.
- Describe the components of a WLAN infrastructure.
- Explain how wireless technology enables WLAN operation.
- Explain how a WLC uses CAPWAP to manage multiple APs.
- Describe channel management in a WLAN.
- Describe threats to WLANs.
- Describe WLAN security mechanisms.

12.1 Introduction to Wireless

1. List and describe the four main types of wireless networks based on the Electrical and Electronics Engineers (IEEE) standards.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

2. List and describe the four types of wireless technology that uses the unlicensed radio spectrum to send and receive data.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

3. Describe MIMO technology.

4. Fill in the description for the 802.11 standards below.

IEEE WLAN Standard	Radio Frequency	Description
802.11	2.4 GHz	
802.11a	5 GHz	
802.11b	2.4 GHz	
802.11g	2.4 GHz	
802.11n	2.4 GHz 5 GHz	
802.11ac	5 GHz	
802.11ax	2.4 GHz 5 GHz	

5. List the two frequency bands that are allocated to 802.11 wireless LANs.

a.

b.

6. List the three International organizations influencing WLAN standards.

a.

b.

c.

12.2 Components of WLANs 7.

7. List the two requirements that Wireless deployments require.

a.

b.

8. if a device does not have an integrated wireless NIC, what is an alternative solution?

9. List and describe what a wireless router serves as.

a. _____ -

b. _____ -

c. _____ -

10. Most wireless routers also provide advanced features, such as?

a.

b.

c.

c.

d.

e.

11. While range extenders are easy to set up and configure, but what is a better solution?

12. APs can be categorized as either autonomous APs or controller-based APs. Describe both.

a. _____ -

b. _____ -

13. List and escribe the three types of wireless antennas.

a. _____ -

b. _____ -

c. _____ -

12.3 WLAN Operation

14. List and describe the three types of Topology modes.

a. _____ -

b. _____ -

c._____ -

15. Infrastructure mode defines two topology building blocks, list and describe both.

a. _____ -

b. _____ -

16. Describe the following 802.11 wireless frame fields.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

e. _____ -

f. _____ -

g. _____ -

h. _____ -

i. _____ -

17. WLANs are _____, shared media configurations.

18. WLANs use _____ (CSMA/CA) as the method to determine how and when to send data on the network.

19. For wireless devices to communicate over a network they must discover a WLAN and subsequently connecting to it. What are the three steps in this process?

a.

b.

c.

20. List the parameters that are required for a wireless client and an AP to have a successful association.

a.

b.

c.

d.

e.

21. List and describe the two types of scanning (probing) processes that wireless devices must use to discover and connect to an AP or wireless router.

a. _____ -

b. _____ -

12.4 CAPWAP Operation

22. Explain what CAPWAP is and does.

23. The CAPWAP split MAC concept does all of the functions normally performed by individual APs and distributes them between two functional components. What are thses conmponents?

a.

b.

24. Explain what DTLS is and does.

25. DTLS is enabled by default to secure the CAPWAP _____channel but is disabled by default for the _____channel.

26. There are two modes of operation for the FlexConnect AP. List and describe both.

a. _____ -

b. _____ -

12.5 Channel Management

27. Wireless LAN devices have transmitters and receivers tuned to specific frequencies of radio waves to communicate. A common practice is for frequencies to be allocated as _____. Such ranges are then split into smaller ranges called _____.

28. If the demand for a specific channel is too high, that channel is likely to become _____. The saturation of the wireless medium _____the quality of the communication.

29. List and describe the three frequency channel saturation techniques.

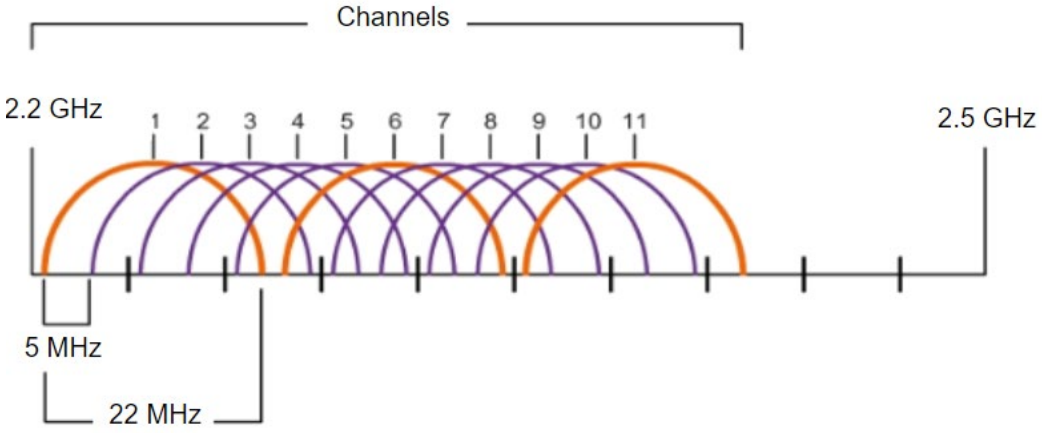
a. _____ -

b. _____ -

c. _____ -

30. A best practice for WLANs requiring multiple APs is to use non-overlapping channels.

31. Based on the graphic what are the three best 2.4 GHz wireless channels to use?



a.

b.

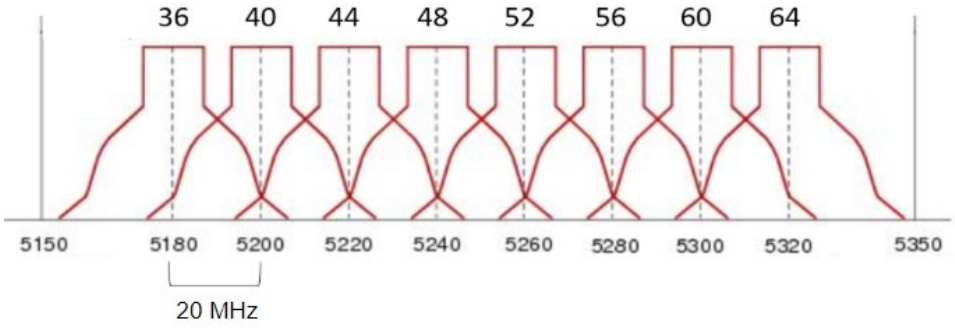
c.

32. _____ occurs when one signal overlaps a channel reserved for another signal.

33. For the 5GHz standards 802.11a/n/ac, there are _____ channels.

34. Explain why it is possible for 5GHz wireless to provide faster data transmission for wireless clients in heavily populated wireless networks.

35. As with 2.4GHz WLANs, choose non-interfering channels when configuring multiple 5GHz APs that are adjacent to each other. Based on the graphic what are your best channel options.



a.

b.

c.

36. What are the recommendations when planning the locations of APs?

a.

b.

c.

d.

e.

f.

12.6 WLAN Threats

37. List and describe what threats wireless networks are specifically susceptible to.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

38. List what wireless DoS attacks can be the result of.

a.

b.

c.

39. Explain what a rouge AP is.

40. Describe a man-in-the-middle attack.

12.7 Secure WLANs

41. To address the threats of keeping wireless intruders out and protecting data, two early security features were used and are still available on most routers and Aps. List and describe both.

a. _____ -

b. _____ -

42. List and describe the two types of authentication that were introduced with the original 802.11 standard.

a. _____ -

b. _____ -

43. List the four shared key authentication techniques available.

a.

b.

c.

d.

44. Home routers typically have two choices for authentication: _____and _____ .

45. List and describe the two WPA2 authentication methods.

a. _____ -

b. _____ -

46. List and describe the two encryption protocols used by WPA and WPA2.

a. _____ -

b. _____ -

47. The Enterprise security mode choice requires an Authentication, Authorization, and Accounting (AAA) RADIUS server.

a. _____ -

b. _____ -

c. _____ -

48. _____ is no longer considered secure.

49. List and describe the four features included with WPA3?

a. _____ -

b. _____ -

c. _____ -

d. _____ -