Name _____ Date _____

Module 7 – WAN Concepts
Study Guide

Tips for success: While answering the questions read Chapter 7, review the summary, and complete the practice Quiz.

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

- Describe how a hierarchical network model is used to design networks.
- Explain the structured engineering principles for network design: **Hierarchy, Modularity**, **Resiliency**, **Flexibility**.
- Describe the three layers of a hierarchical network and how they are used in network design.
- Identify the benefits of a hierarchical design.

7.1.1 LANs and WANs

1. What is the definition of a WAN?

2. What is the difference between a telecommuter and a remote user?

3. What are 5 highlighted differences of a WAN compared to a LAN?

    a.

    b.

    c.

    d.

    e.

7.1.2 Private and Public WANs

4. What are the three features of a dedicated WAN conection?

    a.

    b.

    c.

7.1.3 WAN Topologies

5. What are the 5 WAN topology designs and a definition of each:

    a. _____ -

    b. _____ -

    c. _____ -

    d. _____ -

    e. _____ -

7.1.4 Carrier Connections

6. What is the difference between a single-carrier WAN and a dual-carrier WAN connection?

7. What is the advantage of a dual-carrier connection?

7.1.5 Evolving Networks

8. As WANs pertain to physical size, what list the four types with definitions:

    a. _____ -

    b. _____ =

    c. _____ -

    d. _____ -

7.2 WAN Operations

7.2.1 WAN Standards

9. What are the three modern WAN standards authorities:

    a. _____ -

    b. _____ =

    c. _____ -

10. What two layers of the OSI model are occupied by all WAN standards:

    a.

    b.

11. What are three of the **Layer 1** WAN protocols?

    a. _____ -

    b. _____ =

    c. _____ -

12. What are the 8 **Layer 2** WAN encapsulation types?

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

13. List and define the 10 WAN terms:

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

7.2.4 WAN Devices

14. What is the difference between a DTE and DCE device?

15. List and define the 5 WAN devices and descriptions of each:

1.	
2.	
3.	
4.	
5.	
6.	

7.2.5 Serial Communication

16. Describe the difference between serial and parallel communication.

7.2.6 Circuit-Switched Communication

17. Describe to someone who doesn't know, what's circuit-switched communication?

7.2.7 Packet-Switched Communication

18. Describe to someone who doesn't know, what's packet-switched communication?

7.2.8 SDH, SONET, and DWDM

19. Describe the difference between SDH and SONET:

20. Describe DWDM –

7.3 Traditional WAN Connectivity

7.3.1 Traditional WAN Connectivity Options

21. Sketch out the diagram differentiating between dedicated and switched WAN connectivity options:

7.3.2 Common WAN Terminology

22. What is the difference between a T-carrier and an E-carrier?

7.3.3 Circuit-Switch Options

23. List and define the two traditional circuit-switched options:

7.3.4 Packet-Switch Options

24. List and describe the legacy packet-switched

7.5 Internet-Based Connectivity

7.5.1 Internet-Based Connectivity Options

25. Sketch out the Internet-based connectivity option diagram:

7.5.2 DSL Technology

26. What is the difference between ADSL and SDSL?

27. What determines available bandwidth for subscribers using DSL service?

28. How close to the DSL central office must a subscriber be for signal quality?

29. What is the definition of POTS?

7.5.3 DSL Connections

30. Define the acronym DSLAM and describe what this device does:

7.5.4 DSL and PPP

31. What are three reasons to use PPPoE over DSL?

    a.

    b.

    c.

7.5.5 Cable Technology

32. Define the acronym DOCSIS and what it does:

33. Define the acronym CMTS and what it does:

7.5.6 Optical Fiber

34. Define the acronym FTTH and what it does:

35. Define the acronym FTTB and what it does:

36. Define the acronym FTTN and what it does:

7.5.7 Wireless Internet-Based Broadband

37. List the four wireless Internet-based broadband technologies and define them.

1.	
2.	
3.	
4.	

7.5.8 VPN Technology

38. List four reasons why VPNs are very popular when creating WAN connections:

    a.

    b.

    c.

    d.

39. What are two types of VPNs?

    a.

    b.

7.5.9 ISP Connectivity Options

40. Define the terms and explain the four types of connections to an ISP:

1.	
2.	
3.	
4.	

7.5.10 Broadband Solution Comparison

41. What are some of the benefits of the various WAN technologies?

a. Cable –

b. DSL –

c. Fiber-to the-Home –

d. Cellular/Mobile –

e. Municipal Wi-Fi –

f. Satellite –

7.5.11 Lab - Research Broadband Internet Access Technologies

7.6 Module Practice and Quiz

7.6.1 PT – WAN Concepts

7.6.2 What did I learn in this module?

7.6.3 Module Quiz – WAN Concepts