

Name _____ Date _____

Module 4 - Physical Layer

Introduction to Networks – Semester 1

Student Version

Module 4 Sections:

- 4.0 Introduction
- 4.1 Purpose of the Physical Layer
- 4.2 Physical Layer Characteristics
- 4.3 Copper Cabling
- 4.4 UTP Cabling
- 4.5 Fiber-Optic Cabling
- 4.6 Wireless Media
- 4.7 Module Practice and Quiz

Required Materials:

Reading Organizer

Packet Tracer Activities: 4.6.5 - Connect a Wired and Wireless LAN
 4.7.1 - Connect the Physical Layer

Labs: 4.6.6 - View Wired and Wireless NIC Information

Module's 4 - 7 Exam

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Name _____ Date _____

Module 4 - Physical Layer

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 chapter, you should be able to:

- Describe the purpose and functions of the physical layer in the network.
- Describe characteristics of the physical layer.
- Identify the basic characteristics of copper cabling.
- Explain how UTP cable is used in Ethernet networks.
- Describe fiber optic cabling and its main advantages over other media.
- Connect devices using wired and wireless media.

4.1 Purpose of the Physical Layer

1. What are the components of an access point?

- a.
- b.
- c.

2. What does the OSI physical layer provide?

4.2 Physical Layer Characteristics

3. The physical layer consists of _____, _____, and _____ developed by engineers.

4. List the **name** of the organizations that control the physical layer hardware, media, encoding, and signaling standards.

- a.
- b.
- c.
- d.
- e.
- f.

5. List the three functional areas that physical layer standards address.

- a.
- b.
- c.

6. Explain what codes are.

7. Data transfer is usually discussed in terms of _____.

8. In both 10Mbps and 100Mbps Ethernet, the bits are sent at the speed of electricity. What is the difference between these two speeds?

9. What combination of factors determines the practical bandwidth of a network?

- a.
- b.

10. List and describe the terms used to measure the quality of bandwidth.

a. _____ -

b. _____ -

c. _____ -

4.3 Copper Cabling

11. _____ cabling is the most common type of cabling used in networks today

12. Why do networks use copper media?

a.

b.

c.

13. How is copper media limited?

a.

b.

14. Define signal attenuation.

15. The timing and voltage values of the electrical pulses are susceptible to interference from two sources. List and explain both.

a. _____ –

b. _____ –

16. What can be done to counter the negative effects of EMI and RFI?

17. What can be done to counter the negative effects of crosstalk?

18. Describe how the susceptibility of copper cables to electronic noise can be limited.

a.

b.

c.

19. List the three main types of copper media used in networking.

a.

b.

c.

20. Which cabling is the most common networking media?

21. What type of connectors are used with UTP Cable?

22. Explain the key characteristics of unshielded twisted pair cable.

1.

2.

3.

23. STP cables combine the techniques of shielding to counter _____ and _____, and wire twisting to counter_____.

24. What are the three different types of connectors used with coax cable.

a.

b.

c.

25. List and describe where coaxial cable design is used in the following situations:

a. _____ –

b. _____ –

4.4 UTP Cabling

26. UTP cable does not use shielding to counter the effects of EMI and RFI. List and explain how cable designers can limit the negative effect of crosstalk:

a. _____ –

b. _____ –

27. _____ stipulates the commercial cabling standards for LAN installations and is the standard most commonly used in LAN cabling environments.

28. List some of the elements that are defiance by the UTP cable standards.

a.

b.

c.

d.

e.

29. List and describe the different categories of UTP cable.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

e. _____ -

30. Describe the following UTP cable types.

a. _____ -

b. _____ -

c. _____ -

31. Fill in the following table.

Cable Type	Standard	Application
Ethernet Straight-through		
Ethernet Crossover		
Rollover		

4.5 Fiber-Optic Cabling

32. Optical fiber cable transmits data over longer _____ and at higher _____ than any other networking media

33. The fiber-optic cable acts as a _____, or “ _____,” to transmit light between the two ends with minimal loss of signal.

34. List and describe the two types of fiber-optic cables.

a. _____ –

b. _____ –

35. One of the highlighted differences between MMF and SMF is the amount of dispersion. Explain what dispersion refers to and how it effects the different fiber-optic cables.

36. List the different applications Fiber-optic cabling is now being used in and describe how they are used.

a. _____ –

b. _____ –

c. _____ –

d. _____ -

37. Label the four types of fiber-optic connectors shown below.

a. _____ -



b. _____ -



c. _____ -



d. _____ -



38. Can fiber optic cable be full duplex over a single fiber?

39. The use of color distinguishes between single-mode and multimode patch cords. A yellow jacket is for _____ fiber cables and _____ for multimode fiber cables.

40. Where is optical fiber is primarily used?

a.

b.

4.6 Wireless Media

41. List and describe the limitations of wireless.

a. _____ -

b. _____ -

c. _____ -

D. _____ -

42. List what the physical layer specifications covered by the IEEE and telecommunications industry for wireless data communications cover.

a.

b.

c.

d.

43. List and describe the IEEE 802 wireless standards.

a. _____ -

b. _____ -

c. _____ -

d. _____ -

44. List and describe what network devices are required by a WLAN.

a. _____ -

b. _____ -

45. When purchasing wireless devices, ensure _____ and _____.