Study Questions Covering Week No. 3 Lectures

1. List the various types of multiplexing?
   Give an example for each of type.
2. Define the terms
   (a) Time division multiplexing
   (b) Frequency division multiplexing
3. List 3 different topologies used the most with LAN.
4. State the specifications, advantages, and disadvantages of
   (a) Mesh topology
   (b) Star topology
   (c) Ring topology
   (d) Bus topology.
5. Give an example to a real
   (a) Star network
   (b) Ring network
   (c) Bus network.
6. Is it possible to have a collision between frames in token ring network? Why?
7. Write down, in algorithmic form, the CSMA/CD algorithm.
8. What will happened if a part of a cable is cut in the following network
   (a) Star network
   (b) Ring network
   (c) Bus network.
9. Give the formula that finds the number of cable links necessary for a mesh network topology.
10. For n devices in a network, what is the number of cable links required for a:
    (a) Mesh topology
    (b) Star topology
    (c) Ring topology
    (d) Bus topology.
11. Match the following to a topology type (each can apply to more than one topology):
    (a) New devices can be added easily.
    (b) Control is through a central device.

(c) Transmission time is spent relaying data through non-destination nodes.

12. In communication systems, distinguish between a *peer-to-peer* relationship and a *primary-secondary* relationship.

13. What do the following terms stand for?

    (a) LAN
    (b) MAN
    (c) WAN.

14. What are some of the factors that determine whether a communication system is a LAN, MAN, or WAN?

15. You may found that the speed of the network is faster than the speed of a computer CPU. How can both of them work together?

16. What is the basic function of an NIC card?

17. In which cases does an NIC card communicate with a computer CPU?

18. List the specifications of the various Ethernet generations?

19. What is the name of the network in each Ethernet generation?

20. Describe the three possible connections between an Ethernet and an NIC card.

21. What does each of the following term mean?

    (a) NIC
    (b) 10Base5
    (c) 10Base2
    (d) 10BaseT
    (e) AUI
    (f) AUI cable

22. What is the basic function of a transceiver?

23. Sketch a network consisting of three computers connected to each other through

    (a) Thicknet
    (b) Thinnet
    (c) TP Ethernet

24. In which Ethernet each of the following component is used?

    (a) BNC connector
    (b) RJ45 connector
    (c) AUI connector

(d) transceiver

(e) AUI cable

(f) 10Base5

(g) 10Base2

(h) 10BaseT

25. In TP Ethernet, computers are connected using a hub. This connection looks physically like a star topology, but logically, it is a bus network.
Discuss this issue.

26. What is the advantages of having various connectors in the same Ethernet card?
Is it possible to use more than one connection at the same time?

27. List the various Ethernet wiring schemes.
Discuss the advantages/disadvantages of each scheme.

28. List some factors that a cost of a LAN depends on.

29. When an NIC found a CRC error in a frame, it disregards this frame.
Should a recipient reports this transmission error to the sender? Why?

30. How does an NIC save a computer CPU time?

31. Discuss the placement of the transceiver in 10Base5, 10Base2, and 10BaseT standards.

32. In computer networks, what is a collision?

33. Compare the data transmission rates for traditional Ethernet, Fast Ethernet, and Gigabit Ethernet.

34. List the various physical addressing schemes.
Who is responsible for assigning addresses in each of these addressing schemes?

35. List the various physical addressing schemes.
State the advantages/disadvantages of each of these addressing schemes.

36. List the various physical addressing schemes.
What is the uniqueness scope of each addressing scheme?

37. List the various destination addressing types for a frame.

38. What are the differences between

(a) Broadcast

(b) Multicast

39. What does promiscuous mode mean?

40. Why does a frame content need to be identified inside the frame?

41. Who is using the frame content field?

42. If the frame type is not specified explicitly in the frame header, what are the other possibilities to include this information?

43. Sketch the Ethernet frame format.
Mention the width of each field.

44. What are the differences between

    (a) The original Ethernet frame format
    (b) The IEEE 802.3 Ethernet standard frame format

45. Why does LAN have distance limitation?

46. How can a LAN be extended so that it can run across longer distance?

47. What are the differences between a regular modem and a fiber modem?

48. State the basic function of a fiber modem.
Sketch a network using a fiber modem.

49. State the basic function of a repeater.
Sketch a network which using a repeater.

50. State the basic function of a bridge.
Sketch a network which using a bridge.

51. Make a comparison between repeaters and bridges.

52. Why do bridges not propagate noise signals, while repeaters do?
What does a bridge consist of?

53. How do bridges allow parallelism, while repeaters do not?

54. Bridges can be combined with leased serial line or even leased satellite. Why can not repeaters?

55. Having a cycle of bridges is not desirable. Why?

56. Consider that you have a cycle of bridges.
Mention two cases that lead to problems.
What kind of waste will you have in each case?

57. Why are extra bridges placed in a network?

58. What do bridges do to prevent having a cycle of bridges?

59. Consider a site has 3 Ethernet segments connected by two bridges, i.e., segment I with segment II, and segment II with segment III. One day the network administrator quits and is hastily replaced by someone who has a token ring background. The new administrator noticed that the ends of the network are not connected. Quickly, he orders a new bridge and connects both loose ends to it, making a close ring. What happens next?

60. Discuss the differences between hubs and LAN switches.

61. Sketch a LAN switch which has 5 ports.
Demonstrate the concept underlying this LAN switch.