Subject: Fundamentals of Computer Networks - 030010404

Unit-1 An Introduction

Short Question

1. What is network?
2. List the categories of network.
3. List out types of network.
4. List out types of topologies.
5. What is data communication?
6. Full form of ANSI.
7. Full form of IEC.
8. Full form of ITU.
9. Full form of IEEE.
10. Full form of ISO.
11. Full form of EIA.
12. Full form of IETF and ISOC.
14. List layers of OSI model.
15. What is the purpose of application layer.
16. What is open system.
17. Define the following terms:
   a. Computer Network
   b. Protocol
   c. Broadcast
   d. Topology
18. Give the full form of following:
   e. ANSI
   f. ICE
   g. ITU
   h. IEEE
   i. ISO
19. List different category of Network.
20. For n devices in a network, what is the number of cable links required for a mesh, ring, bus and star topology?
21. What is the difference between half-duplex and full-duplex transmission modes?
22. What are some of the factors that determine whether a communication system is LAN or WAN?
23. Identify five components of data communication system.
24. What are the advantages of a multipoint connection over point-to-point connection?
25. Why are standard needed?
26. Name the four network topologies, and cite an advantage of each type.
27. What are the three criteria necessary for an effective and efficient network?
28. Why are protocols needed?
29. What is OSI Model?
30. List Layers of OSI Model?
31. What is used of Physical Layer?
32. What is used of Data link Layer?
33. What is used of Network Layer?
34. What is used of Transport Layer?
35. What is used of Session Layer?
36. What is used of Presentation Layer?
37. What is used of Application Layer?
38. List five components of data communication system.
39. List application of Computer Network.
40. What is Bus topology?
41. What is Star topology?
42. What is Ring topology?
43. What is Tree topology?
44. What is Mesh topology?
45. When LAN is used?
46. When MAN is used?
47. When WAN is used?
48. What is multimedia network?
49. Which are the factors that affect on physical topology?
50. Differentiate bus topology and ring topology.
51. Enlist responsibility of physical layer. [2]
52. Enlist the responsibility Application layer.[1]
53. Explain the layer in detail, which is responsible for routing of packet. [2]
54. Explain the layer, which is responsible for packet-to-packet delivery of source to destination. [2]
55. Explain physical address and logical address. [2]

Long Question

1. Explain teleconferencing.
2. List advantages and disadvantages of bus topology.
3. List advantages and disadvantages of star topology.
4. List advantages and disadvantages of ring topology.
5. List advantages and disadvantages of tree topology.
6. List advantages and disadvantages of mesh topology.
7. Explain about broadcast network.
8. Explain about point-to-point network.
9. Explain about LAN.
10. Explain about MAN.
11. Explain about WAN.
12. Explain about multimedia network.
14. Explain the functionalities done by OSI layers.
15. Draw the figure of OSI model.
16. Discuss simple mail transfer protocol and file transfer protocol.
17. Write note on component of data communication
18. Write advantages and uses of computer network.
19. Write application area of Computer Network.
Fill in the blanks

1. ________ saw the emergence of the world wide web.
2. The MARK1 was designed in ________.
3. ________ Topology is fully connected topology.
4. In OSI model ________ layer is to provide user services such as electronic mail, file transfers, remote job entry, and resource allocation.
5. In OSI model ________ layer enables sharing of remote drives and printers.
6. ________ layer in OSI model deals with the transfer of bits over a communication channel.
7. The links connecting the devices are called ________.
8. ________ networks consist of many connections between individual pairs of machines.
9. ________ networks have a single communication channel that is shared by all the machines on the network.
10. The number of layers available in OSI model is ________.
11. Network designers have developed general blueprints usually called ________.
12. If a computer on the network shares resources for others to use, it is called ________.
13. ________________ Networks are organized into workgroups.
14. A ________ _____ in a network is dedicated to performing specific task in network.
15. In ________ topology, if a computer’s network cable is broken, whole network goes down.
16. Terminators are used in ________________ topology.
17. Broad casting is absent in ________________ layer.
18. ________ Layer is used to determine signal type: analog or digital.
19. ________ layer is used to determine network path on which to route packets.
20. ________ layer used for data encryption.
21. ________ topology used combination of various topologies.
22. In ________ topology all computers are connected to each other with individual cable.
23. All computers are connected to a single device is called ________________ topology.
24. Number of links to connect n nodes in a mesh topology is = _______
25. Mesh Topology is _______ flexible and has a _______ expandability
26. In BUS topology, at each end of the bus is a ____________, which absorbs any signal, removing it from the bus.
27. In BUS topology, One can easily add any new node or delete any node with-out affecting other nodes; this makes this topology easily _____________.
28. ______ and __________ will force a maximum length of shared medium which can be used in BUS topology.
29. The two alternatives for the operation of the central node in STAR topology are:__________ and _____________.
30. In Ring Topology, the links are ____________; that is, data are transmitted in ____________ direction only and all are oriented in the same way.
31. In Ring Topology, Repeater works in 3 modes: ____________, _____________ and _____________.
32. A computer network interconnects a number of ___________ computers.
33. Computer network emerges due to the development between two fields, namely ___________ and _____________.
34. Three main categories of networks are ____________, ___________ and _____________.
35. ___________ are privately owned while ___________ are usually owned by government.
36. LAN operates at a ___________ speed with ____________ error rate than WANs.
37. Internet is ____________ of networks.
38. Initially, computer network was developed for _____________.

**State True / false**

40. The 1990 saw the emergence of the world wide war.
41. Transferring data between computer is just one area of e-mail.
42. Teleconferencing allows conferences to occur without the participants being in the same place.
43. Star topology is easy to install and wire.
44. Maximum ring length and number of nodes are limited.
45. The mesh topology has indirect connection between every pair of devices in the network.
46. LANs are normally installed and maintained by the organization.
47. LANs have data rates in the range 7 to 16.
48. The physical layer deals with the transfer of bits over a communication channel.
49. Network architecture is optional for network designers.
50. The 1990 saw the emergence of the world wide war.
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59. Network architecture is optional for network designers.
60. In star topology all computers are connected to each other with individual cable.
61. Database server stores the data of network.
62. A server in network will use and provide network resources.
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<thead>
<tr>
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<tbody>
<tr>
<td>63.</td>
<td>Server, peer and client are the role of network in computer.</td>
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<tr>
<td>64.</td>
<td>In star topology all computers are connected with single backbone cable.</td>
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<td>65.</td>
<td>There is no centralized security in peer based network.</td>
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<td>66.</td>
<td>Internet is a network of network.</td>
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<td>67.</td>
<td>MAN is cover inside a town or city.</td>
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<td>68.</td>
<td>In broadcasting only one can send and more than one can receive.</td>
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<td>69.</td>
<td>Print server allow user to share fax services over a network.</td>
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<td>70.</td>
<td>Wide area network are connected across a distance of less than 30 miles.</td>
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<td>71.</td>
<td>Networks cannot extend beyond the boundaries of a building.</td>
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<td>72.</td>
<td>LANs typically connect separate offices in the same organization, whether they are across town or around the world from each other.</td>
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<td>73.</td>
<td>Each network device must have a unique address so that data can be transmitted reliably to and from that device.</td>
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<td>74.</td>
<td>A MAN is a network with a size between a LAN and a WAN.</td>
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<td>75.</td>
<td>The standard used for wireless LANS is IEEE 802.10.</td>
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<td>76.</td>
<td>Latest LANs operate at very high speeds up to 1000 Gbps.</td>
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<td>77.</td>
<td>The combination of LANs and MANs is known as WAN.</td>
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<td>78.</td>
<td>The main purpose of each layer is to give services to lower layer.</td>
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<tr>
<td>79.</td>
<td>In connection oriented service, the source and destination have a fixed path.</td>
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**Multiple choice question**

80. For large networks, _______ topology is used.
   a. Bus  
   b. Star  
   c. Ring  
   d. Mesh

81. In a ring topology computer is:
   e. Connected with a single cable  
   f. Connected with a central hub  
   g. Connected with two computers  
   h. Connected with two or more computers

82. The following layer is used to determine signal type: analog or digital.
   i. Physical layer  
   j. Data link layer  
   k. Network layer  
   l. Presentation layer

83. In following topology, if a computer’s network cable is broken, whole network goes down.
   m. Ring  
   n. Mesh  
   o. Tree  
   p. Star

84. Following topology has direct connection between every pair of devices in the network .
   q. Ring  
   r. Mesh
s. Tree
t. Star

85. The following networks consist of many connections between individual pairs of machine.
   u. Broadcast network
   v. Point to Point network
   w. All of the above
   x. None of the above.

86. The following is used to interconnect workstation distributed around office within a single building or group of building.
   y. LAN
   z. MAN
   aa. WAN
   bb. None

87. ISO stands for
   a. International Standard Organization
   b. International Student Organization
   c. Integrated Services Organization

88. ISO OSI model is used in
   a. Stand alone PC
   b. Network environment

89. Network cable lies on _____ layer
   a. Application
   b. Network
   c. Physical

90. _____ layer decides which physical pathway the data should take.
   a. Application
   b. Network
   c. Physical

91. Layer is responsible for routing of packet
   a. Application
   b. Network
   c. Transport

92. Which OSI layer defines the functions of logical network-wide addressing and routing?
   a. Layer 1
   b. Layer 2
   c. Layer 3
   d. Layer 4
   e. Layer 5
   f. Layer 6
   g. Layer 7

93. Which OSI layer defines the standards for cabling and connectors?
94. Which of the following terms are not valid terms for the names of the seven OSI layers?
   a. Application
   b. Data link
   c. Transmission
   d. Presentation
   e. Internet
   f. Session

Unit-2 Communication media & data transmission

Short Question

1. What is Analog Signals.
2. What is Digital Signals.
3. What is bit interval.
4. What is bit rate.
5. Define digital bandwidth.
6. What is the different between digital data and analog data.
7. Give example of analog information and digital information.
8. List the methods use to convert digital to analog conversion.
9. Name the two major categories of transmission media.
10. What do you mean by wireless communication.
11. List the three wireless communications.
12. List the categories of transmission .
13. Full form of EBCDIC.
14. What is parallel transmission.
15. What is serial transmission.
16. List the two ways to provide serial transmission.
17. Full form of DTE.
18. Full form of DCE.
19. List the four categories of DTE-DCE interfacing.
20. What is multiplexing.
21. List two techniques of multiplexing.
22. Full form of FDM.
23. Full form of TDM.
24. Full form of WDM.
25. What is micro waves.
26. List two kinds of infrared emitters.
Long Question

1. Explain advantages of digital communication.
2. Explain digital to analog conversion.
3. How to convert analog conversion to digital conversion.
4. Explain the difference between modulation and demodulation.
5. Explain three methods of converting digital to analog.
6. Explain twisted pair in transmission media.
7. Explain baseband coaxial cable in transmission media.
8. Explain broadband coaxial cable in transmission media.
9. Explain why parallel transmission is more expensive.
10. Explain about INTERFACING.
11. Explain multiplexing in detail.
12. Explain about wavelength division multiplexing.
13. List the advantages of radio waves.
15. Explain serial transmission.

Multiple Choice Questions

1. Computer Network is ________________.
   A. Collection of hardware components and computers
   B. Interconnected by communication channels
   C. Sharing of resources and information
   D. All of the Above

2. What is a Firewall in Computer Network?
   A. The physical boundary of Network
   B. An operating System of Computer Network
   C. A system designed to prevent unauthorized access
   D. A web browsing Software

3. How many layers does OSI Reference Model has?
   A. 4
   B. 5
   C. 6
   D. 7

4. DHCP is the abbreviation of
   A. Dynamic Host Control Protocol
   B. Dynamic Host Configuration Protocol
   C. Dynamic Hyper Control Protocol
   D. Dynamic Hyper Configuration Protocol

5. IPV4 Address is
   A. 8 bit
   B. 16 bit
   C. 32 bit
   D. 64 bit
6 DNS is the abbreviation of  
A. Dynamic Name System  
B. Dynamic Network System 
C. Domain Name System 
D. Domain Network Service 

7 What is the meaning of Bandwidth in Network?  
A. Transmission capacity of a communication channels  
B. Connected Computers in the Network  
C. Class of IP used in Network 
D. None of Above 

8 ADSL is the abbreviation of  
A. Asymmetric Dual Subscriber Line  
B. Asymmetric Digital System Line  
C. Asymmetric Dual System Line 
D. Asymmetric Digital Subscriber Line 

9 What is the use of Bridge in Network?  
A. to connect LANs  
B. to separate LANs  
C. to control Network Speed 
D. All of the above 

10 Router operates in which layer of OSI Reference Model?  
A. Layer 1 (Physical Layer)  
B. Layer 3 (Network Layer) 
C. Layer 4 (Transport Layer)  
D. Layer 7 (Application Layer) 

11 Each IP packet must contain  
A. Only Source address  
B. Only Destination address 
C. Source and Destination address  
D. Source or Destination address 

12 Bridge works in which layer of the OSI model?  
A. Appliation layer  
B. Transport layer  
C. Network layer 
D. Datalink layer 

13 _______ provides a connection-oriented reliable service for sending messages  
A. TCP  
B. IP  
C. UDP 
D. All of the above 

14 Which layers of the OSI model are host-to-host layers?  
A. Transport, Session, Presentation, Application  
B. Network, Transport, Session, Presentation 
C. Datalink, Network, Transport, Session  
D. Physical, Datalink, Network, Transport
15. Which of the following IP address class is Multicast
   A. Class A
   B. Class B
   C. Class C
   D. Class D

16. Which of the following is correct regarding Class B Address of IP address
   A. Network bit – 14, Host bit – 16
   B. Network bit – 16, Host bit – 14
   C. Network bit – 18, Host bit – 16
   D. Network bit – 12, Host bit – 14

17. The last address of IP address represents
   A. Unicast address
   B. Network address
   C. Broadcast address
   D. None of above

18. How many bits are there in the Ethernet address?
   A. 64 bits
   B. 48 bits
   C. 32 bits
   D. 16 bits

19. How many layers are in the TCP/IP model?
   A. 4 layers
   B. 5 layers
   C. 6 layers
   D. 7 layers

20. Which of the following layer of OSI model also called end-to-end layer?
   A. Presentation layer
   B. Network layer
   C. Session layer
   D. Transport layer

**Fill in the blanks**
21. In digital signals _______ interval is the time required to send one signal bit.
22. The most common application of twisted pair is the ___________ system.
23. In _______ transmission a signal is transmitted in one or multiple directions depending on the type of antenna.
24. Electromagnetic waves having frequencies between 1 and 300 GHz called __________.
25. _______ mode is used to define the direction of signal flow between two linked devices.
26. _______ multiplexing is used with analog signals.
27. _______ multiplexing is used with digital signals.
28. The application of WDM is __________.

**State True/False**
29. Analog signals add complexity to data communications.
30. A human voice is the example of analog data.
31. In transmission media, the signals are transmitted from one device to another in the form of
32. A twisted pair consist of two insulated copper wires typically about 3mm thick.
33. Electromagnetic waves having frequencies between 3KHz and 1GHz are called radio waves.
34. Infrared light can be used as a medium for telecommunication.
35. Parallel transmission are commonly used when the distance between the two devices are short.
36. Serial transmission is expensive and reliable than parallel transmission.
37. Multiplexing technology is used on computer networks and especially over LAN.
38. One application of WDM is the SONET in which multiple optical fibre lines are multiplexed and demultiplexed.
39. Allows the upper layers to access the media using techniques such as framing. Controls how data is placed onto the media and is received from the media using techniques such as media access control (MAC) and error detection.
40. List and define the 5 typical field types. → Start and stop indicator fields - The beginning and end limits of the frame
   Naming or addressing fields
   Type field - The type of PDU contained in the frame
   Quality - control fields
   A data field - The frame payload (Network layer packet)
41. What services are supported by 802.11? → Authentication, association (connectivity to a wireless device), and privacy (encryption)
42. Define logical multi-access topology. → Enables a number of nodes to communicate by using the same shared media
43. What happens the frame as moves from source to destination? → It changes based on the medium used

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**Unit-3 Error detection and Correction**

**Short question:**

1. List the types of errors.
2. What is single bit error.
3. What is burst error.
4. List the types of redundancy checks used in data communication.
5. Full form of CRC.
6. Full form of LRC.
7. What is error detection.
8. What is error correction.
9. What is length of the burst error.
10. What is redundancy.
11. What is vertical redundancy check.
12. What is Cyclic redundancy check.
13. Explain function of data link layer.
14. List of different framing methods.
15. What is flow control in data link layer.
16. Which error detection method uses one's complement arithmetic?
17. Which error detection method consists of just one redundant bit per data unit?
18. In cyclic redundancy checking, what is the CRC?
**Long questions:**
1. Explain parity check and checksum.
2. What is error? Explain two error types.
3. Difference between bit error and burst error.
4. Explain in brief error detection.
5. Explain in brief error correction.
6. What is the purpose of hamming code.
7. List the steps involved in creating checksum.
8. How does the cyclic redundancy checker know the received data unit is undamaged.
9. Explain in brief the data link layer functions.
10. Explain in brief different framing methods.
11. Explain in brief CRC.
12. Explain different between correction and detection.
14. Explain redundancy and types of redundancy checks.
15. Explain CSMA, CSMA/CD and CSMA/CA.

**Multiple Choice Questions**
1. The ________ layer is responsible for the delivery of a message from one process to another.
   - A) physical
   - B) transport
   - C) network
   - D) none of the above
2. A port address in TCP/IP is ______ bits long.
   - A) 32
   - B) 48
   - C) 16
   - D) none of the above
3. Communication in TCP is ___________.
   - A) simplex
   - B) half-duplex
   - C) full-duplex
   - D) none of the above
4. In the original ARPANET, _______ were directly connected together.
   - A) IMPs
   - B) host computers
   - C) networks
   - D) routers
5. _______ is the protocol suite for the current Internet.
   - A) TCP/IP
   - B) NCP
   - C) UNIX
   - D) ACM
6. _______ defines how a particular pattern to be interpreted, and what action is to be taken based on that interpretation.
   - A) Semantics
   - B) Syntax
C) Timing  
D) None of the above  

7. The last address of IP address represents  
   A. Unicast address  
   B. Network address  
   C. Broadcast address  
   D. None of above  

8. How many bits are there in the Ethernet address?  
   A. 64 bits  
   B. 48 bits  
   C. 32 bits  
   D. 16 bits  

9. How many layers are in the TCP/IP model?  
   A. 4 layers  
   B. 5 layers  
   C. 6 layers  
   D. 7 layers  

10. ISO OSI model is used in  
    a. Stand alone PC  
    b. Network environment  

11. Network cable lies on _____ layer  
    a. Application  
    b. Network  
    c. Physical  

12. _____ layer decides which physical pathway the data should take.  
    a. Application  
    b. Network  
    c. Physical  

13. Layer is responsible for routing of packet  
    a. Application  
    b. Network  
    c. Transport  
    d. None of above.  

14. Frequency of failure and network recovery time after a failure are measures of the _______ of a network.  
    a. Performance  
    b. Reliability  
    c. Security  
    d. Feasibility  

15. An unauthorized user is a network _______ issue.  
    a. Performance  
    b. Reliability  
    c. Security  
    d. All the above
Fill in the blanks:
1. The difference between the first corrupted bit and the last corrupted bit is called ________.
   [State True / false]
2. It is not easy to detect the error without comparison of the receiving data and the original data.
3. The checksum of 0000 and 0000 is ________.
4. The checksum of 1111 and 1111 is ________.
5. In one's complement arithmetic, if positive 7 is 0111, then negative 7 is ________.
6. Checksums use ________ arithmetic.
7. A generator that contains a factor of _____ can detect all odd-numbered errors.
8. The divisor in a cyclic code is normally called the ________.
9. If the Hamming distance between a dataword and the corresponding codeword is three, there are _____ bits in error.
10. In block coding, if n = 5, the maximum Hamming distance between two codewords is ________.
11. The Hamming distance between 100 and 001 is ________.
12. The Hamming distance between equal codewords is ________.
13. In block coding, if k =2 and n =3, we have ______ invalid codewords.
14. We can divide coding schemes into two broad categories: _______ and _______ coding.
15. __________ protocol was based on the specification called the Ethernet.
16. MAC(Medium Access Control) sub layer is between the __________
17. Depending on the transmission media used, the Ethernet can be classified into following categories are ____________________
18. All stations in a Thick Ethernet is connected to a
19. A burst error means that two or more bits in the data unit have changed.
20. In ________ error correction, the receiver corrects errors without requesting retransmission.
21. In modulo-2 arithmetic, ________ give the same results.
22. To guarantee the detection of up to 5 errors in all cases, the minimum Hamming distance in a block code must be.
23. A simple parity-check code can detect ________ errors.
24. The _____of errors is more difficult than the______.
25. The Hamming distance between equal codewords is .
26. The Hamming distance between 100 and 001 is.

State True/False
1. Checksum error detection method uses one's complement arithmetic?
2. CRC error detection method consists of just one redundant bit per data unit?
3. In cyclic redundancy checking, crc is the divisor.
4. In cyclic redundancy checking, the divisor is one bit less then the CRC.
5. A burst error means that two or more bits in the data unit have changed.
6. In onward error correction, the receiver corrects errors without requesting retransmission.
7. In forward error correction, the receiver asks the sender to send the data again.
8. We can divide coding schemes into two broad categories block and linear coding.
9. The Hamming rule between two words is the number of differences between corresponding bits.
10. To guarantee the detection of up to 5 errors in all cases, the minimum Hamming distance in a
11. To guarantee correction of up to 5 errors in all cases, the minimum Hamming distance in a block code must be 5.
12. A simple parity-check code can detect 2 errors.
13. The Hamming distance between equal codewords is n.
14. The Hamming distance between 100 and 001 is 1.
15. The divisor in a cyclic code is normally called the degree.

Unit-4 Data link control and Protocol concepts

Short questions:
1. What is flow control?
2. What is error control?
3. List two techniques developed to control the flow of data across communication links.
4. Full form of ARQ.
5. Which protocol was based on the specification called the Ethernet?
6. Where MAC (Medium Access Control) sub layer is available?
7. Full form of CRC.
8. List the nodes used by LAN in transmission of equipment.
9. List the sublayers divided by data link layer.
10. Full form of FDDI.
11. Full form of DQDB.
12. Which protocol was based on the specification called the Ethernet?
13. Which device is used to link two network segments, which are separated by a long distance?
14. What is the third variation of IEEE 802.3 standard?
15. What is the advantage of Token ring mechanism?
16. What is the frame format of a token ring in a ring topology?

Long questions:
1. Explain stop and wait flow control.
2. Explain sliding window flow control.
3. Why is flow control needed?
4. What is the use of a buffer at the receiver in flow control?
5. What does the term ‘error control’ mean in the data link layer?
6. Difference between flow control and error control.
7. Explain stop and wait ARQ.
8. Explain go back-N ARQ.
9. Explain selective reject ARQ.
10. What is damaged frame and lost frame in error control?
11. What is the purpose of ARQ?
12. What is the minimum ethernet cable length for a CAT6 gigabit connection?

Fill in the blanks:
1. A _________ is basically all of the components, hardware and software, involved in connecting computers across small and large distances.
2. Ethernet _________ has/have both a physical and logical bus topology.
3. _________ has both physical and logical ring topologies.
4. ________ has a physical star topology but a logical ring topology.
5. A ________ is used to connect networking devices that are in a very close geographic area, such as a floor of a building, a building itself, or a campus environment.
6. A ________ uses Gigabit Ethernet as a media type.
7. A ________ provides a high-speed infrastructure to move data between storage devices and file servers.
8. The ________ layer provides for hardware addressing.
9. CSMA/CD stands for ________.
10. Ethernet ________ uses a type field.
11. The network layer solves all of the following problems except ___________.
12. Connection multiplexing is done through the use of a ________ number.
13. ________ component of the data link layer for IEEE specifies network protocols?
14. MAC addresses are ________ bits in length and are represented in a ________ format.
15. ________ standards or protocols are used by the session layer?

State True /False
1. A NIC card can be used for wifi?
2. UTP is unbound transmission media?
3. Rom memories needs refresh?
4. A form of wireless transmission infrared transmission in which signals are sent via pulses of infrared lights?
5. A communications device that combines transmissions from several I/O devices into one line is multiplexer.
6. Modem might not be present in a computer network?
7. To connect two networks of similar systems using bridge.
8. LAN network covers the largest geographical area.
10. The interactive transmission of data within a time sharing system may be best suited to full duplex lines.
11. CSMA/CD protocol was based on the specification called the Ethernet.
12. The IEEE802.3 Ethernet frame format are preamble 7 byte.
13. The characteristics of optical fibre CSMA/CD LAN are low loss of power.
14. A stream of data is called a token.
15. The frame format of a token ring in a ring topology is preamble.

Unit – 5 Local Area Network

Short question:
1. List factors that affect the design of LAN when a new LAN is installed.
2. Full form of NIC.
3. Full form of FDDI.
4. Full form of ATM.
5. Full form of CRC.
6. List the nodes used by LAN in transmission of equipment.
7. List the sublayers divided by data link layer.
8. Full form of FDDI.
9. Full form of DQDB.
10. What is gigabit Ethernet?
11. List Ethernet technologies.
12. List operating systems included by primary LAN.
13. What is the firewall in computer network?
14. How many layers does OSI reference model has?
15. What is abbreviation of DHCP?
16. What is the abbreviation of DNS?
17. What is meaning of bandwidth in network?
18. What is the abbreviation of ADSL?
19. What is the use of bridge in network?
20. Which component of the data link layer for IEEE specifies network protocols?
21. When a host on network A sends a message to a host on network B, which address does the router look at?

Long question:
22. Discuss the types of networks and topology for LAN.
23. Describe the function of network interface card.
24. Is a router different from a bridge? Explain.
25. Difference between hub and bridge.
26. Explain LAN transmission equipment.
27. What is the function of gateway.
29. Why are two buses needed in DQDB.
30. Discuss logical link control and medium access control.
31. Difference between token bus and token ring.
32. Explain LAN operating systems and protocols
33. Explain about Ethernet technology.
34. Difference between 10 base-T and 100 base-T.
35. Difference between 10 base-2 ethernet and gigabit Ethernet.

Multiple choice question
1. The _______ is the physical path over which a message travels.
   A) Protocol
   B) Medium
   C) Signal
   D) All the above
2. The information to be communicated in a data communications system is the _______.
   A) Medium
   B) Protocol
   C) Message
   D) Transmission
3. Frequency of failure and network recovery time after a failure are measures of the _______ of a network.
   A) Performance
   B) Reliability
C) Security
D) Feasibility

4 An unauthorized user is a network ______ issue.
   A) Performance
   B) Reliability
   C) Security
   D) All the above

5 Which topology requires a central controller or hub?
   A) Mesh
   B) Star
   C) Bus
   D) Ring

6 Which topology requires a multipoint connection?
   A) Mesh
   B) Star
   C) Bus
   D) Ring

7 Communication between a computer and a keyboard involves __________ transmission.
   A) simplex
   B) half-duplex
   C) full-duplex
   D) automatic

8 A television broadcast is an example of ______ transmission.
   A) simplex
   B) half-duplex
   C) full-duplex
   D) automatic

9 A ______ connection provides a dedicated link between two devices.
   A) point-to-point
   B) multipoint
   C) primary
   D) secondary

10 In a ______ connection, more than two devices can share a single link.
    A) point-to-point
    B) multipoint
    C) primary
    D) secondary

11 In ______ transmission, the channel capacity is shared by both communicating devices at all times.
   A) simplex
   B) half-duplex
   C) full-duplex
   D) half-simplex

12 In the original ARPANET, ______ were directly connected together.
   A) IMPs
   B) host computers
   C) networks
D) routers

13 ________ is the protocol suite for the current Internet.
A) TCP/IP
B) NCP
C) UNIX
D) ACM

14 ________ defines how a particular pattern to be interpreted, and what action is to be taken based on that interpretation.
A) Semantics
B) Syntax
C) Timing
D) None of the above

15 Data flow between two devices can occur in a ________ way.
A) simplex
B) half-duplex
C) full-duplex
D) all of the above

**True /False:**
1. The TCP/IP Network layer is equivalent to the combined session, presentation, and application layers of the OSI model.
2. As the data packet moves from the upper to the lower layers, headers are removed.
3. The physical layer is concerned with the movement of bits over the physical medium.
4. To deliver a message to the correct application program running on a host, the port address must be consulted.
5. Ethernet uses a 32 bit physical address that is imprinted on the network interface card (NIC).
6. The network layer is the layer closest to the transmission medium.
7. The OSI model consists of 9 layers.
8. The IP address, also known as the link address, is the address of a node as defined by its LAN or WAN.
9. Layer 2 lies between the physical layer and the Data link layer.
10. In the OSI model, as a data packet moves from the lower to the upper layers, headers are added.
11. In the OSI model, when data is transmitted from device A to device B, the header from A's layer 5 is read by B's session layer.
12. UDP is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
13. The Session layer establishes, maintains, and synchronizes the interactions between communicating devices.
14. A port address in TCP/IP is 16 bits long.
15. The Port address, also known as the link address, is the address of a node as defined by its LAN or WAN.

**Unit : 6 Wide Area Network & Wireless LAN's**
Short question:
1. List the switching techniques used in WAN.
2. Full form of TDMA.
3. Full form of FDMA.
4. Full form of SMA.
5. List WAN carrier types.
6. Full form of SONET.
7. Full form of ISDN.
8. What is WLAN.
9. List WAN carrier types.
10. What is T-carrier line.
11. List two phases of circuit switching.

Long question:
12. Explain message switching and packet switching.
13. Explain WLAN applications.
14. Difference between SONET and ISDN.
15. Explain SONET.
16. List the benefits of ISDN.
17. Discuss about any two WAN carrier types.
18. Explain packet switching.

Fill in the blanks:
1. The process-to-process delivery of the entire message is the responsibility of the _______ layer.
2. The _______ layer is the layer closest to the transmission medium.
3. Mail services are available to network users through the _______ layer.
4. As the data packet moves from the upper to the lower layers, headers are _______.
5. When data are transmitted from device A to device B, the header from A's layer 4 is read by B's _______ layer.
6. The _______ layer changes bits into electromagnetic signals.
7. In the OSI model, as a data packet moves from the lower to the upper layers, headers are _______.
8. In the OSI model, when data is transmitted from device A to device B, the header from A's layer 5 is read by B's _______ layer.
9. In the OSI model, encryption and decryption are functions of the _______ layer.
10. To deliver a message to the correct application program running on a host, the _______ address must be consulted.
11. IPv6 has _______ -bit addresses.
12. The _______ layer is responsible for moving frames from one hop (node) to the next.
13. The Internetworking Protocol (IP) is a _______ protocol.
14. _______ is a process-to-process protocol that adds only port addresses, checksum error control, and length information to the data from the upper layer.
15. _______ provides full transport layer services to applications.
16. The______ address identifies a process on a host.
True/False:
1. UDP and TCP are both Data link layer protocols.
2. In the sending computer, UDP sends a data unit to the IP layer.
3. UDP performs process to process communication.
4. In the sending computer, UDP receives a data unit from the transport layer.
5. The local host and the remote host are defined using IP addresses. To define the processes, we need second identifiers called UDP addresses.
6. UDP is an acronym for User Delivery Protocol.
7. UDP is called a connectionless transport protocol.
8. One of the responsibilities of the transport layer protocol is to create a host to host communication.
9. The source port address on the UDP user datagram header defines the sending computer.
10. TCP is a stream-oriented protocol.
11. TCP allows the sending process to deliver data as a block of bytes and allows the receiving process to obtain data as a block of bytes.
12. TCP groups a number of bytes together into a packet called a datagram.
13. TCP is a(n) unreliable transport protocol.
14. TCP uses out-of-band signalling to check the safe and sound arrival of data.
15. The bytes of data being transferred in each connection are numbered by TCP. The numbering starts with a 1.

Multiple choice question:
1. TCP has
   A) packets
   B) segments
   C) segments
   D) none of the above
2. The options field of the TCP header ranges from 0 to _______ bytes.
   A) 10
   B) 20
   C) 40
   D) none of the above
3. Multiply the header length field by _______ to find the total number of bytes in the TCP header.
   A) 2
   B) 4
   C) 6
   D) none of the above
4. IP is responsible for _______ communication while TCP is responsible for _______ communication.
   A) host-to-host; process-to-process
   B) process-to-process; host-to-host
   C) process-to-process; network-to-network
   D) none of the above
5. TCP delivers _______ out-of-order segments to the process.
   A) all
6. TCP sliding windows are __________ oriented.
   A) packet
   B) segment
   C) byte
   D) none of the above

7. To accomplish flow control, TCP uses a __________ window protocol.
   A) limited-size
   B) sliding
   C) fixed-size
   D) none of the above

8. __________ control regulates the amount of data a source can send before receiving an
   acknowledgment from the destination.
   A) Error
   B) Flow
   C) Congestion
   D) none of the above

9. In TCP, one end can stop sending data while still receiving data. This is called a ______.
   A) half-close
   B) half-open
   C) one-way termination
   D) none of the above

10. Connection establishment in TCP is called __________ handshaking.
    A) two-way
    B) four-way
    C) one-way
    D) none of the above

11. A TCP segment is encapsulated in __________.
    A) an IP datagram
    B) an Ethernet frame
    C) a UDP user datagram
    D) none of the above

12. The__________ layer is responsible for the delivery of a message from one process to another.
    A) physical
    B) transport
    C) network
    D) none of the above

13. A port address in TCP/IP is ______ bits long.
    A) 32
    B) 48
    C) 16
    D) none of the above

14. Communication in TCP is ____________.
    A) simplex
    B) half-duplex
16. TCP assigns a sequence number to each segment that is being sent. The sequence number for each segment is the number of the ______ byte carried in that segment.
   A) first
   B) last
   C) middle
   D) none of the above