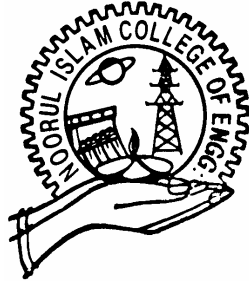


**NOORUL ISLAM COLLEGE OF ENGINEERING  
Kumaracoil**



Department of Computer Applications

Sub. Name : Computer Networks

Sub. Code : MC1701

Class : S3 MCA Semester : Third

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**Sub. Name: COMPUTER NETWORKS**

**Sub. Code: MC1701 Semester: Third**

**2 – Marks.**

1. Define a Protocol.

Protocol is a set of traffic rules and Procedures used for communication between entities in different systems.

2. What are the key elements in a protocol.?

i. Syntax - Includes data format and Signal levels

ii. Semantics — Includes control information for co-coordinating & Error handling

iii. Timing — Includes speed matching and sequencing

3. What is a Data Communication.?

Data communication is the process of sending data electrically from one location to another. Linking one computer to another permits the power and resources of that computer to be tapped.

4. Bit stuffing

The insertion of extra bits into a data stream to avoid the appearance of unintended control sequences

5. Bridge

A functional unit that interconnects two local area networks (LANs) that use the same logical link control protocol but may use different medium access control protocols.

6. Switched Communication network

A communication network consisting of a network of nodes connected by point- to-point links Data are transmitted from source to destination through intermediate nodes.

7. Define a Bandwidth.

Bandwidth or grade of a communication channel determines the rate or speed that data can be transmitted over a channel.

8. What are the applications of Optical fiber cable? Optical fiber cable is used in

- a) Long-haul trunks
- b) Metropolitan Trunks
- c) Rural-Exchange trunks
- d) Subscriber loops
- e) Local Area networks

9. What are the applications of Coaxial cables?

Coaxial cable is used in

- a) Television Distribution

- b) Long-distance telephone transmission
- c) Short-run computer system links
- d) Local Area Networks

10. What are the functions of network Layer. in OSI Model.?

- Routing

- Logical addressing (eg. IPaddressing)
- Address transformations
- Accounting & Billing
- Source to Destination error free delivery

11. What are the functions of Data Link Layer. in OSI Model.?

- a. Addressing
- b. Flow Control
- c. Media Access Control(MAC)
- d. Synchronization
- e. Error Control
- f. Node-to-Node Delivery

12. Medium access (MAC)

For broadcast networks, the method of determining which device has access to the transmission medium at any time CSMA/CD and token are common access methods

13. Microwave

Electromagnetic waves in the frequency range of about 2 to 40 GHz.

14. What are the functions of physical layer in OSI Model..?

- a. Signal Encoding
- b. Medium (what are the medium used & its Properties)
- c. Bit Synchronization
- d. Transmission type
- e. Transmission Mode(Is transmission is simplex or half duplex or full duplex)
- f. Topology identification(Star or ring or bus etc)
- g. Multiplexing (Which multiplexing Techniques used)
- h. Interface(How are the two closely linked devices connected)
- i. Bandwidth( Which band width used)
- j. Signal type (eg. Are Analog or Digital Signal Used)

15. What are the responsibilities of Transport Layer. in OSI Model.?

- a. Host-to-host message delivery

- b. Application-to-application communication
- c. Segmentation & Reassembly
- d. Create logical connection between the source & Destination

16. Open Systems Interconnection (OSI) Reference Model

A model for communications between cooperating devices. It defines a seven- layer architecture of Communication functions.

17. What are the functions of Presentation Layer in OSI Model.?

- a. Data format Translation
- b. Encryption
- c. Data compression

18. What are the responsibilities of Application Layer in OSI Model.?

- a. Network Abstraction
- b. File access & Transfer (File download and or upload)
- c. Mail Services
- d. Remote Login( Eg. TELNET)
- e. World wide web – WWW (Access web pages)

19. Define a LAN.?

A Local Area Network(LAN) is a privately owned network within a single office, buildings or campus, covering a distance of a few kilometers.

20. Write a Short note about Computer Networks.?

Interconnected autonomous computer are called computer networks. Computers are interconnected using communication medial like Twisted pair cables, Coaxial cables, Fiber optic cable, Microwaves or satellites etc. Main reason for designing network is to share the resources like printers, disk, programs and data.

21. What are the differences between connection oriented and connectionless Services.?.;

Sl.No	Connection Oriented Services	Connectionless Services
1	Connection has to established before actually starting communication  The sequence of data transmitted and received is same	No need for establishing a path, each message carries the full destination address and hence each one is routed through the system independently.
2	Reliability with acknowledgement	Sequence of Transmission and reception of data need not necessarily be the same.

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## 22. Propagation delay

The delay between the times a signal enters a channel and the time it is received.

## 23. Write a short note about Multiplexing

Multiplexing divides the physical line or a medium into logical segments called channels. In multiplexing different channels carry data simultaneously over the same physical medium. Hardware equipment called Multiplexer combine the (or multiplexes) the input from the different sources, and load them on different channels of a medium. The combined data traverse over the medium simultaneously. At the destination, a demultiplexer separates (or demultiplexes) the signals and sends them to their different destinations.

## 24. What are the fundamental functions of Protocols

- Establishing necessary conventions
- Establishing a standard Communication path
- Establishing a standard data Element

## 25. Packet

A group of bits that includes data plus control information. Generally refers to a network layer (OSI layer 3) protocol data unit.

## 26. Packet switching

A method of transmitting messages through a communication network, in which long messages are subdivided into short packets. The packets are then transmitted as in message switching.

## 27. Cross talk

The phenomenon in which a signal transmitted on one circuit or channel of a transmission system creates an undesired effect in another circuit or channel.

## 28. State the Functions of a Bridge

- a. Read the frames transmitted by the source station and addressed to destination station
- b. Using Medium Access Control Protocol for destination station, retransmit the frames on to destination
- c. Does the same for destination to source also

## 29. Piggybacking

The inclusion of an acknowledgment to a previously received packet in an outgoing data packet

## 30. Plaintext

The input to an encryption function or the output of a decryption function

31. What are the applications of Telnet?

TELNET Protocol allows remote login services, so that a user on a client computer can connect to a server on a remote system.

32. Mention any two functions of IP.

- a. Providing a link between networks
- b. Providing for the routing and delivery of data between processes of different networks.
- c. Providing an accounting services
- d. It supports for
  - Different Addressing Schemes
  - Different maximum packet size
  - Different network access mechanisms
  - Different timeouts
  - Error Recovery
  - Status reporting
  - Routing Techniques
  - User Access Control
  - Connection, Connectionless Services

33. Simplex transmission

Data transmission in one pre assigned direction only

34. Define a Frame relay

Frame relay is the form of packet switching based on the use of variable length, link0 layer frames. There is no network layer in this and many of the functions have been streamlined or eliminated to provide for greater throughput.

35. Authentication

A process used to verify the integrity of transmitted data, especially a message.

36. Write a short note about contention.?

Two or more stations want to use the same communication channel to send the data to their respective destinations. Both the stations check the status of the channel simultaneously, and find it ideal, send their respective frames at the same time, there will be collision. So it is possible to damage some bits of data or the whole data. This is called Collision or Contention. To avoid collision Ethernet Protocols are used.

37. Write a short note about congestion

If the users of the network send data at the rate that is faster than the network can handle. Every switch on the network has a finite processing speed and memory buffer to hold packets temporarily before they can be forwarded. If the resources are too small compared

to the incoming packets, then the network would become quite slow. Some flow control technique should be used to avoid the Congestion

### 38. Frequency-division multiplexing

The division of a transmission facility into two or more channels by splitting the frequency band transmitted by the facility into narrower bands, each of which is

### 39. Analog data

Data represented by a physical quantity that is considered to be continuously variable and whose magnitude is made directly proportional to the data or, to a suitable function of the data.

### 40. What are the functions of Session Layer in OSI Model.?

- a. Session & Sub-session generation
- b. Synchronization (Decide the order in which data needed to be passed to the transport layer)
- c. Dialog control (Decides which user! application sends data and what point of time and whether the communication is simplex/half duplex/full duplex)

Session closure

### 41. Analog transmission

The transmission of analog signals without regard to content. The signal may be amplified, but there is no intermediate attempt to recover the data from the signal.

### 42. Asymmetric encryption

A form of cryptosystem in which encryption and decryption are performed using two different keys, one of which is referred to as the public key and one of which is referred to as the private key. Also known as public-key encryption.

### 43. Noise

Unwanted signals that combine with and hence distort the signal intended for transmission and reception.

### 44. Asynchronous transmission

Transmission in which each information character is individually synchronized (usually by the use of start elements and stop elements)

### 45. Bandwidth.

The difference between the limiting frequencies of a continuous frequency spectrum

### 46. Mention any two characteristics features of fiber optic transmission media.

- a. Resistance to Noise — Optical fiber uses light rays for communication. Therefore noise is not an issue for this.
- b. Huge Band width — the band width offered by optical fiber is huge

c. Higher signal carrying capacity — the signal carried by the optical fiber travel long distances without needing regeneration.

#### 47. Application layer

Layer 7 of the OSI model. This layer determines the interface of the system with the user.

#### 48. Base band.

Transmission of signals without modulation. In a base band local network, digital signals (1s and 0s) are inserted directly onto the cable as voltage pulses. The entire spectrum of the cable is consumed by the signal. This scheme does not allow frequency-division multiplexing.

#### 49. Application layer

Layer 7 of the OSI model. This layer determines the interface of the system with the user.

#### 50. Bit error rate

The probability that a transmitted bit is received in error

#### 51. Periodic Waveform

A waveform  $f(t)$  that satisfies  $f(t) = f(t + nk)$  for all integers  $n$ , with  $k$  being a constant

#### 52. Carrier

A continuous frequency capable of being modulated or impressed with a second (information carrying) signal

#### 53. Checksum

An error-detecting code based on a summation operation performed on the bits to be checked.

#### 54. Baud

A unit of signaling speed equal to the number of discrete conditions or signal events per second, or the reciprocal of the time of the shortest signal element

#### 55. Cipher text

The output of an encryption algorithm; the encrypted form of a message data

#### 56. Broadband ISDN (B-ISDN)

A second generation of ISDN. The key characteristic of broadband ISDN is that it provides transmission channels capable of supporting rates greater than the primary ISDN rate.

#### 57. Circuit switching

A method of communicating in which a dedicated communications path is established between two devices through one or more intermediate switching nodes. Unlike packet switching, digital data are sent as a continuous stream of bits. Bandwidth is guaranteed, and delay is essentially limited to propagation time. The telephone system uses circuit switching.

#### 58. Broadband



The uses of coaxial cable for providing data transfer by means of analog (radio- frequency) signals. Digital signals are passed through a modem and transmitted over one of the frequency bands of the cable.

59. Communication data transfer

A protocol for exchanging data in an unplanned fashion and without prior coordination (e.g., datagram)

60. CSMA (Carrier Sense Multiple Access)

A medium access control technique for multiple access transmission media. A station wishing to transmit first senses the medium and transmits only if the medium is idle.

61. Amplitude modulation

A form of modulation in which the amplitude of a carrier wave is varied in accordance with some characteristic of the modulating signal

62. CSMA/CD (Carrier Sense Multiple Access with Collision Detection)

A refinement of CSMA in which a station ceases transmission if it detects a collision

63. Cyclic redundancy check

An error-detecting code in which the remainder resulting from dividing the bits to be checked by a predetermined binary number.

64. Data circuit-terminating equipment (DCE)

In a data station, the equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line. The DCE may be separate equipment or an integral part of the DTE or of intermediate equipment. The DCE may perform other functions that are normally performed at the network end of the line.

65. Datagram

In packet switching, a packet, independent of other packets, that carries information sufficient for routing from the originating data terminal equipment (DTE) to the destination DTE without the necessity of establishing a connection between the DTEs and the network.

66. Connection-oriented data transfer

A protocol for exchanging data in which a logical connection is established between the endpoints (e.g., virtual circuit)

67. Contention

The condition when two or more stations attempt to use the same channel at the same time.

68. Data terminal equipment (DTE)

Equipment consisting of digital end instruments that convert the user information into data signals for transmission, or reconvert the received data signals into user information.

69. What are the applications of satellite Microwave Communication System.? Satellite Microwave communication system is used in the

a) Television Distribution

b) Long-distance telephone transmission

c) Private business networks

70. What is a Infrared Communication.?

Infrared communication is a one type of communication in which the communication is achieved using transceivers (Transmitter/Receiver) that modulate no coherent infrared light. Transceivers must be in line of sight of each other, each directly or via reflection from light-colored surface such as the ceiling of a room

71. Digital signal

A discrete or discontinuous signal, such as voltage pulses

72. Digital switch

A star topology local network. Usually refers to a system that handles only data but not voice.

73. What are the three basic types of modems used in the microcomputers..?

a) Acoustic coupler modems b) External direct-connect modem

c) Internal direct-connect modem

74. Digital transmission

The transmission of digital data, using either an analog or digital signal, in which the digital data are recovered and repeated at intermediate points to reduce the effects of noise.

75. Encapsulation

The addition of control information by a protocol entity to data obtained from a protocol user.

76. Data link layer

In OSI, the layer that provides service to transfer data between network layer entities, usually in adjacent nodes. The data link layer detects and possibly corrects errors that may occur in the physical layer.

77. Error-detecting code.

A code in which each expression conforms to specific rules of construction, so that, if certain errors occur in an, expression, the resulting expression will not conform to the rules of construction and thus the presence of the errors is detected

78. Error rate.

The ratio of the number of data units in error to the total number of data units

79. Thermal noise

Statistically uniform noise due to the temperature of the transmission medium.

80. Flow control

The function performed by a receiving entity to limit the amount or rate of data that is sent by a transmitting entity.

81. Frame

A group of bits that includes data plus one or more addresses and other protocol control information. Generally refers to a link layer (OSI layer 2) protocol data unit.

#### 82. Frame check sequence

An error-detecting code inserted as a field in a block of data to be transmitted. The code serves to check for errors upon reception of the data.

#### 83. Frame relay

A form of packet switching based on the use of variable-length link layer frames. There is no network layer and many of the basic functions have been streamlined or eliminated to provide for greater throughput.

#### 84. What is a modem? Why is it needed?

Modem is a device used to bridge the gap between digital and analog transmission or to allow the digital data to be transmitted / received over from the telephone lines.

Data in Computer systems are formatted as digital pulse and telephone lines are designed to transmit the human voice. So the digital pulse must be converted to an analog signal before they are transmitted

The process of converting digital signal into an analog signal is called modulation and the process of re-converting an analog signal to digital pulse is called demodulation.

#### 85. Frequency modulation

Modulation in which the frequency of an alternating current is the characteristic varied.

#### 86. Full-duplex transmission

Data transmission in both directions at the same time

#### 87. Half-duplex transmission

Data transmission in either direction, one direction at a time

#### 88. Collision

A condition in which two packets are being transmitted over a medium at the same time. Their interference makes both unintelligible.

#### 89. HDLC (high-level data link control)

A very common bit-oriented data link protocol (OSI layer 2) issued by ISO, Similar protocols is LAPB, LAPD, and LLC.

#### 90. Internet work

A collection of packet switching and broadcast networks that are connected via routers

#### 91. Star

A topology in which all stations are connected to a central switch. Two stations communicate via circuit switching.

#### 92. Internet working

Communication among devices across multiple networks

93. Local area network

A communication network that provides interconnection of a variety of data communicating devices within a small area

94. Impulse noise

A high-amplitude, short-duration noise pulse

95. Manchester encoding

A digital signaling technique in which there is a transition in the middle of each bit time. A 1 is encoded with a high level during the first half of the bit time; a 0 is encoded with a low level during the tint half of the bit time.

96. Modem (modulator/demodulator)

Transforms a digital bit stream into an analog signal (modulator), and vice versa (demodulator).

97. Network layer

Layer 3 of the OSI model. Responsible for routing data through a communication network

98. Internet protocol

An internetworking protocol that provides connectionless service across multiple packet-switching networks

99. Network terminating equipment

Grouping of ISDN functions at the boundary between the ISDN and the subscriber

100. Protocol data unit (PDU)

A set of data specified in a protocol of a given layer and consisting of protocol control information of that layer, and possibly user data of that layer

101. Non-return to zero

A digital signaling technique in which the signal is at a constant level for the duration of a bit time

102. Optical fiber

A thin filament of glass or other transparent material through which a signal encoded light beam may be transmitted by means of total internal reflection

103. Parity bit.

A check bit appended to an array of binary digits to make the sum of all the binary digits, including the check bit, always odd or always even.

104. Routing

The determination of a path that a data unit (frame, packet, message) will traverse from source to destination.

105. Phase

For a periodic signal  $f(t)$ , the fractional part  $t/P$  of the period  $P$  through which  $t$  has advanced relative to an arbitrary origin. The origin is usually taken at the last previous passage through zero from the negative to the positive direction.

#### 106. Modulation.

The process, or result of the process, of varying certain characteristics of a signal, called a modulation, in accordance with a message signal.

#### 107. Multicast address

An address that designates a group of entities within a domain (e.g., network, Internet)

#### 108. Phase modulation

Modulation in which the phase angle of a carrier is the characteristic varied.

#### 109. Phase-shift keying

Modulation in which the phase of the carrier signal is shifted to represent digital data

#### 110. Multiplexing

In data transmission; a function that permits two or more data sources to share a common transmission medium such that each data source has its own channel.

#### 111. Token ring

A medium access control technique for rings. A token circulates around the ring. A station may transmit by seizing the token, inserting a packet onto the ring, and then retransmitting the token.

#### 112. Point-to-point

A configuration in which two stations share a transmission path

#### 113. Presentation layer

Layer 6 of the OSI model. Provides for the selection of a common syntax for representing data and for transformation of application data into and from the common syntax.

#### 114. Pulse code modulation

A process in which a signal is sampled, and the magnitude of each sample with respect to a fixed reference is quantized and converted by coding to a digital signal.

#### 115. Ring

A local network topology in which stations are attached to repeaters connected in a closed loop. Data are transmitted in one direction around the ring and can be read by all attached stations.

#### 116. Service access point

A means of identifying a user of the services of a protocol entity. A protocol entity provides one or more SAPs for use by higher-level entities.

#### 117. Time-division switching

A circuit switching technique in which time slots in a time-multiplexed stream of data are manipulated to pass data from an input to an output.

118. Sliding-window technique

A method of flow control in which a transmitting station may send numbered packets within a window of numbers. The window changes dynamically to allow additional packets to be sent.

119. Token bus

A medium access control technique for bus/tree, Stations form a logical ring, around which a token is passed. A station receiving the token may transmit data and then must pass the token on to the next station in the ring.

120. Space-division switching

A circuit-switching technique in which each connection through the switch takes a physically separate and dedicated path

121. Value-added network

A privately owned packet-switching network whose services are sold to the public

122. Protocol control information

Information exchanged between entities of a given layer, via the service provided by the next lower layer, to coordinate their joint operation

123. Public key

One of the two keys used in an asymmetric encryption system. The public key is made public, to be used in conjunction with a corresponding private key.

124. Stop and Wait Protocol

A flow control protocol in which the sender transmits a block of data and then awaits an acknowledgement before transmitting the next block

125. Network Topology

The structure, consisting of paths and switches that provide the communications interconnection among nodes of a network

126. Synchronous transmission

Data transmission in which the time of occurrence of each signal representing a bit is related to a fixed time frame

127. Synchronous time-division multiplexing

A method TDM in which time slots on a shared transmission line are assigned to I/O channels on a fixed, predetermined basis

128. Transmission medium

The physical path between transmitters and receivers in a communications system

129. Unbalanced transmission

A transmission mode in which signals are transmitted on a single conductor. Transmitter and receiver share a common ground.

#### 130. Virtual circuit

A packet-switching service in which a connection (virtual circuit) is established between two stations at the start of transmission. All packets follow the same route, need not carry a complete address and arrive in sequence.

#### 131. Transport layer

Layer 4 of the OSI model. Provides reliable transparent transfer of data between endpoints.

#### 132. Define a SNMP

SNMP is tool for Network Monitoring and Control. It resides in the application layer..  
SNMP works with two other components.,

a) Structure of Management Information (SMIT)- SMI provides guidelines for SNMP for handling objects(Variables, Router names ect)

b) Management Information Base (MIB) - is the collection of objects for an agent

#### 133. Amplitude-shift keying

Modulation in which the two binary values are represented by two different amplitudes of the carrier frequency

#### 134. Physical layer

Layer I of the OSI model. Concerned with the electrical, mechanical, and timing aspects of signal transmission over a medium.

#### 135. Digital signature

An authentication mechanism that enables the creator of a message to attach a code that acts as a signature. The signature guarantees the source and integrity of the message.

#### 136. Decryption

The translation of encrypted text or data (called ciphertext) into original text or data (called plaintext). Also called deciphering.

#### 137. Symmetric encryption

A form of cryptosystem in which encryption and decryption are performed using the same key. Also known as conventional encryption.

#### 138. Analog signal

A continuously varying electromagnetic wave that may be propagated over a variety of media

#### 139. Time-division multiplexing

The division of a transmission facility into two or more channels by allotting the facility to several different information channels, one at a time

#### 140. Router

An internetworking device that connects two computer networks. It makes use of an internet protocol and assumes that all of the attached devices on the networks use the same communications architecture and protocols. A router operates at OSI layer 3.

#### 141. Public data network

A government-controlled or national-monopoly packet switching network. This service is publicly available to data processing users.

#### 142. Session layer

Layer 5 of the OSI model. Manages a logical connection (session) between two communicating processes or applications.

#### 143. Asynchronous transfer mode (ATM)

A form of packet transmission using fixed size packets, called cells. ATM is the data transfer interface for B-ISDN, Unlike X.25, and ATM does not provide error control and flow control mechanisms.

#### 144. Private Key

One of the two keys used in an asymmetric encryption system. For secure communication, the private key should only be known to its creator

#### 145. Delay distortion

Distortion of a signal occurring when the propagation delay for the transmission medium is not constant over the frequency range of the signal

#### 146. Digital data

Data consisting of a sequence of discrete elements

#### 147. Twisted pair

A transmission medium consisting of two insulated wires arranged in regular spiral pattern

#### 148. Steps to be followed in Common Communication Patterns

Identify the communication needs.

Extracting their common communication request

Incorporate the functionality

#### 149. Latency?

Time taken to travel the data from one end to other end of the network is called Latency.

#### 150. Propagation delay in the Networks.

Time delay to transmit the data through communication medias. It is based upon the light transmission.

#### 151. Bandwidth

Bandwidth or grade of a communication channel determines the rate or speed that data can be transmitted over a channel.



152. State the difference between Direct and Indirect Link Networks In Direct Linking Direct Communication path will established

No direct path is established in indirect networks

153. What are the applications of satellite Microwave Communication System.? Satellite Microwave communication system is used in the

d) Television Distribution

e) Long-distance telephone transmission

f) Private business networks

154. What is a Infrared Communication.?

Infrared communication is a one type of communication in which the

Communication is achieved using transceivers (Transmitter/Receiver), that modulate no coherent infrared light. Transceivers must be in line of sight of each other, each directly or via reflection

155. Two dimensional parity bit checking.

Parity bits calculation in row wise and column wise is called two dimensional parity bit checking

156. Stop-and- wait flow control.

A flow control protocol in which the sender transmits a block of data and then awaits an acknowledgement before transmitting the next block

157. ARQ error control.

Automatic Repeat Request is called ARQ. When error happened it automatically detect the error and correct the error

158. Transceiver

Transceiver is a device used in the Ethernet cards, Its main functions are

Establish connection between computer & Ethernet Sensing voltage on the cable and interpreting signal

159. Reason for repeaters are necessary in some networks Repeaters are necessary in the networks to strengthen the signaling.

160. The purpose of a Beacon frame.

If any station suspects a failure on a ring, it sends a frame to the suspected destination. This frame is called Beacon frame.

161. Fiber Distributed Data Interface.

FDDI is dual ring network that consists of two independent networks in opposite directions.

162. Difference between a token-holding timer and a token rotation timer. Token holding time is the time taken to hold the token in a station Token rotation timer is the time taken to rotate the token in a ring

163 How does a station remove itself from a token bus network?

When the transmission is over the original frame should reach the source and then it will verify the CRC field for error detection & Correction process. If no error the station will Be removed from the token bus.

164 Properties of an Ethernet network

General Properties

Carrier Sense

CSMA & CSMA/CD

Packet Switch Network

Physical Properties

Ethernet Transceiver

Ethernet Adopter

Ethernet Cable

Addressing Mechanism

165. CSMA/CD

CSMA/CD is a medium access control technique for multiple access transmission media. A station wishing to transmit first senses the medium and transmits only if the medium is idle. Otherwise it will continuously sensing the channel. If collision occurred detect the collision and correct it

166. “Self handling” type of network.

When an error occurs/ failure happened in the hosts, FDDI automatically it and use another ring for data transmission process. It is called Self handling.

167. Purpose of a transceiver and the Network Interface Card in a network.?

Transceiver — Establish connection between computer & Ethernet

1. Sensing voltage on the cable and interpreting signal

Network Adaptor — performs all network function

CRC Checking

168. Necessity of Medium Access Control.

While using shared mediums for data transmission it is possible to use the L more than one stations at a time. So it is possible to arise collision. So some f control mechanism is necessary to control the stations. That is called MAC.

169. State the merits and demerits of Bus and ring topologies.

Bus topology is easy to install and use less cable. But it is difficult to add new nodes in the bus, because addition of a node changes the number of tapes and the average distance between them which is optimized for the bus length. Fault isolation is very difficult. Even is a portion of a bus breaks down, the whole bus can not function.

Ring topology is easy to configure and install. Fault isolation is very easy. If a node in a ring fails then the whole ring network can not work. The traffic is in one direction.

170. Give the frame format for 802.5 Token Ring.

8	8	8	48	48	variable	32	8	8
Star delimiter	Access control	Frame control	Dest. Address	Src Address	Body	Checksum	End delimiter	Frame status

171. Define the “Runt frame”.

When error happened for a station it will try to correct the errors. Meantime it is possible to capture the communication media by and other stations. To avoid this received station to be corrected the data will send a 32 bit sequence frame to the source. So no other stations will try to get the channel. This frame is called runt frame.

172. What is Token Holding Time.?

In ring network how long the token is holed in a station is called token holding time

173. What is a tag and what are the different types of tags?

A Tag is any additional information included in a message that helps the receiver to decode the message.

Type tag — indicates that the value that follows is an integer, floating-point number or whatever.

Length tag — indicates the number of elements in the array.

Architecture tag — indicates whether the architecture is receiver-makes right at canonical intermediate form.

174. What is a stub?

Stub is a piece of code that implements argument marshalling. The stub marshals the procedure arguments into a message that can be transmitted by means of the RPC protocol.

175. What is encoding and decoding.

Translating data for transmission over the network is called encoding. Translating the arriving message into a representation for processing by the remote system is called Decoding.

176. What is the difference between lossless compression and lossy compression.

Lossless compression ensures that the data recovered from the compression/decompression process is exactly the same as the original data.

Lossy compression does not promise that the data received is exactly same as the original data.

177. State some lossless compression algorithms.

Run length Encoding

Differential pulse code modulation

Dictionary based methods

178. Draw the block diagram of JPEG compression.

Draw the diagram

178. What are the three phases of Image compression?

DCT phase

Quantization phase

Encoding phase

179. What are the different frame types in video compression?

I frames — for Intrapicture

P frames — for Predicted picture

B frames — for Bidirectional predicted picture.

180. What is Cryptography?

Cryptography is the process of encrypting the original plain text into cipher text to transmit it over the network with additional security and then converting the cipher text into plain text.

181. What is the difference between the Secret key algorithms, Public key algorithms and the hashing algorithms in Cryptography?

Secret key algorithms are Symmetric, in which both the participants share the same key for encryption and decryption.

Public key algorithms involve each person having a private key that is shared with no one else. The message is encrypted with public key and is decrypted with the private key.

Hash function doesn't use any keys. But, they use a regular hash map function.

182. What are the three distinct phases of Data Encryption Standard?

The 64 bits in the block are permuted.

Sixteen rounds of an identical operation are applied to the resulting data and the key.

The inverse of the original permutation is applied to the result.

183. What are the differences between host name and host address?

Host names are variable length mnemonics that make the user to remember the address easily.

Host addresses are fixed length, and it is easy for the router to process.

Names have no information to help the network to locate the host.

Addresses have the routing information embedded in to it.

28. What is DNS?

DNS implements a hierarchical name space for internet objects. Domain Name

System is used for naming the hosts, which are actually processed form left to right.

184. Write any three application protocols.

SMTP — Simple mail transfer protocol, used to exchange electronic mail

HTTP — Hypertext Transport Protocol, used to communicate between Web browsers and Web servers.

SNMP — Simple Network Management Protocol, is used to query the state of remote network nodes.

30. Explain HTTP and SNMP.

-Http message transfer, request and format

-SNMP's interaction ways.

### 16 Marks Question

1. Explain The OSI Reference in Detail. Seven Layers

- 1) Physical layer
- 2) Data Link layer
- 3) Network Layer
- 4) Transport layer
- 5) Session layer
- 6) Presentation layer
- 7) application Layer

2. Explain the requirements to build a network in detail

Connectivity 2) Cost-effective Resource Sharing 3) Support for Common Services 4) Performance.

3. Explain the different approaches used in framing in detail.

- i)Byte oriented protocols
- ii) Bit oriented Protocols
- iii) Clock based framing

4. Explain Ethernet IEEE 802.3 Protocols in detail.

Definition

Use of Ethernets

Physical Properties Access Protocol

Frame format

Addresses

Transmitter Algorithm

5. Wireless LANs(IEEE 802.11)

Physical Properties

Collision Avoidance

Distributed System

Frame Format

## 6. Encoding Techniques

Different encoding techniques like NRZ, NRZI, Manchester, 4B/5B With necessary figures.

## 7. Techniques used for transmission error detection and Correction Introduction

about the errors during data transmission      Error Detection/Correction Methods – Algorithm, Explanation with example.

Two Dimensional Parity

Internet Checksum Algorithm

Cyclic Redundancy Check

## 8. Short note about the following

i) Stop-and Wait Protocols

Definition

Timeline for Four Different scenarios for the Stop & Wait algorithm

Timeline for stop-and wait with 1-bit sequence number(2 Marks)

ii) Sliding Window Protocols

Definition

Sliding Window algorithm

Sliding window on receiver - figure with explanation

Sliding window for Sender- figure with explanation

Implementation

iii) Concurrent Logical Channels

## 9. Explain the video compression mechanism.

-Explain about frames and pictures

- Explain frame types and their linear editing method.

## 10. Explain Cryptographic algorithms.

Explain Cryptography

Explain Data Encryption Standard

Explain RSA algorithm

Explain Message digest 5(MD5)

## 11. Explain Domain Naming Service in detail.

-Explain DNS

-Difference between host address and host name.

-Explain Domain hierarchy.

-Name servers and Name resolution.

12. Explain the traditional applications of DNS.

-Explain SMTP, HTTP, SNMP.

-Explain Electronic mail.

-Explain message transfer.

13. Explain Simple demultiplexer with necessary diagrams.

-Host to host delivery service

-Unreliable, connectionless and order of delivery not ensured.

-Explain how the ports are identified with address.

-Draw the neat diagram of header.

-Explain the header fields in detail.

14. Explain the reliable byte stream protocol with neat diagrams

-reliable, connection oriented, ensure order of delivery

-Explain about Flow control and congestion control

-give the end-to-end issues

-Draw TCP header format and explain each fields.

-Explain Connection establishment and termination.

-three way handshake.

15. What are the advantages of sliding window algorithm and explain it in detail.

Sliding window algorithm is used

- guaranteeing reliable delivery of data

- ensure the data is delivered in order

- enforces flow control between sender and receiver

Explain Reliable and ordered delivery

Explain Flow control

Explain protecting against Wraparound

Explain keeping the pipe full

16. What are the different algorithms for Adaptive retransmission?

Explain original algorithm for Adaptive retransmission

Explain Karn/Partridge algorithm

Explain Jacobson/Karels algorithm

17. Explain the different TCP congestion control mechanisms.

Explain Additive increase! Multiplicative Decrease mechanism

Explain slow start

Explain Fast Retransmit and Fast Recovery

18. Explain the different congestion avoidance mechanisms.

Explain DEC bit

Explain Random Early detection

Explain Source-based congestion Avoidance

19. Explain the lossless compression algorithms.

Explain Run length encoding

Explain Differential pulse code modulation

Explain Dictionary-based methods

19. Explain image compression in detail.

Explain Image compression

Explain DCT phase, Quantization phase, Encoding phase.

20. Explain the video compression mechanism.

-Explain about frames and pictures

- Explain frame types and their linear editing method.

21. Explain Cryptographic algorithms.

Explain Cryptography

Explain Data Encryption Standard

Explain RSA algorithm

Explain Message digest 5(MD5)

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-Difference between host address and host name.

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