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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COMPUTER NETWORKS

2 MARKS QUESTIONS & ANSWERS

UNIT 1

PHYSICAL LAYER

Part A

1. The five important components of data communication are,

   A. message

   B. sender

   C. receiver

   D. medium

   E. protocol

2. What are Local Area Networks?

   Local Area network is a privately owned network that connects devices with in office, building or campus ranging few kilometers.

3. Explain half duplex communication.

   In half duplex mode of communication each station can transmit or receive the message (data).

4. Two functions of session layer are,

   A. dialog control

   B. synchronization

5. Four topologies of computer networks are,

   A. mesh topology

   B. star topology

   C. star topology

   D. bus topology

6. What is the use of hub?

All networks require a central location to bring media segment together, which facilitate adding, deleting or moving work stations

7. Define protocol?

A protocol is a set of rules that govern all aspects of information communication.

8. Define guided media?

Guided media

1. The signal energy propagates within the guided media

2. Guided media is mainly suited for point to point communication

9. Define guided media?

Unguided media

1. The signal energy Propagates through air

2. Unguided media is mainly used for broadcasting purpose

10. Define Topology.

Topology is defined as the manner in which the nodes are geometrically arranged   and connected

11. What is OSI?

A standard that specifies a conceptual model called open systems interconnection (OSI) network reference model, which breaks networked communicationsinthesevenlayers: Application, Presentation, Session, Transport, Network, and Datalink&Physical.

12. What is Packet Switching?

a) Packet Switching is a transmission method in which packets are transmitted
b) Over a networking medium that maintains several paths between sender and receiver.

13. Define Physical Layer?

Physical Layer is the bottom layer of the OSI model where data is transmitted across the actual network medium.

14. What are the advantages of LAN?

The advantages of LAN are,

1. Speed

2. Flexibility

3. Reliability

4. Resource sharing

5. Centralized management

6. Privately Owned Network

15. What is a datagram?

Datagram is an independent transmission unit in a packets switching network.

16. What is the prime function of Physical layer?

Physical layer transmits raw bits over a communication channel.

17. Why circuit switching is not suitable for non voice transmission?

Circuit switching requires physical connection between to devices that limits the bandwidth and data rate.

18. What are the disadvantages of Token ring Protocol?

1. Break in ring disables entire network

2. Installation is difficult

3. Timing jitter

4. Propagation delay.

19. What are the most common error control techniques?

1. Stop and Wait ARQ

2. Go-Back-N ARQ

3. Selection Repeat ARQ

20. What are the major advantages of shielded twisted pair over unshielded twister pair?

1. STP as protective sheathing

2. STP offers better performance at lower data rates

3. Less interference

Unit – 2

Data Link Layer

1. What is the function of bridge?

Filter traffic by reading packet address

Link dissimilar network

Link segment of a network together

2. What does 10/100 Mbps Ethernet interface mean?

The interface can communicate between 10 Mbps & 100 Mbps device

3. What is bit stuffing and why it is needed in **HDLC**?

Bit stuffing is the process of adding one extra zero whenever there are five connective 1's in the data so that the receiver does not mistake the data for a flag. It is needed to handle data transparency.

4. What is **VCI**?

A VCI is a small identifier number of each data packet in a circuit switched network.

5. What is **DLCI**?

In frame relay, each virtual circuit has a distinct number and is called Data Link Connection Identifier

6. Define preamble?

Preamble consists of seven bytes. The **PRE** is an alternating pattern of ones and zeros that tells receiving station that a frame is coming, and that provides a means to synchronize the frame – reception portions of receiving physical layers with the incoming bit stream.

7. State the functions of **FRAD**?

The FRAD dissembles and assembles the other protocol frames to make suitable to handle by frame relay.

8. Explain **LMI** features of frame relay?

LMI helps to provide management functions like,

   a) Keep – alive mechanism
   b) Multicast mechanism
   c) Mechanism to check the switch status

9. Name the protocols which are collision free?

A bit- map protocol

Binary countdown

10. State different techniques for channel allocation for digital cellular radio?

GSM

CDPD

CDMI

11. Distinguish between **FDDI** & **Token ring**?

FDDI is a backbone to connect LAN's, while in token ring workstations are connected directly

12. Distinguish between bridge and router?

Bridge is a hardware networking device used to connect two LAN's and router is used to connect two different LAN's of two different modes.

13. What is a main drawback of stop and wait algorithm?

If the sender's frame is lost, the receiver never sends an acknowledgement and the sender will wait forever.

14. What is the size of Ethernet address?

2-6 octets

15. What is the length of **802.3 MAC** address?

2 or 6 octets

16. What is **FDDI**?

Fiber Distributed Data Interface is a fiber optic based counter rotating token ring architecture.

17. What is **pure ALOHA**?

In pure ALOHA, each station transmits a packet whenever it ready to send and inefficient channel utilization (18.4%)

18. What is **slotted ALOHA**?———

In slotted ALOHA a station can transmit data in specified time slots only and channel utilization is 37%.

19. State different cable standards for fast Ethernet cabling?

   a. 100 BASET 4
   b. 100 BASET X
   c. 100 BASEFX

20. How many layers are defined in **ATM** standards?

   I. Physical layer
  II. ATM layer
 III. Application Adaptation layer

UNIT III
NETWORK LAYERS

1. What is the function of project 802 standards?

802.1àdeal with internet working it standard for LAN'S.802.2àprovide information about the logical link control which is the upper sub layer of data link layer.802.3à provides information about media access control (MMC), which is the lower sub layer of the data link layer

2. Write the function of IEEE802.1 standard?

This standard provides internet working information for LAN'S&MAN'S. It is the internet working standard.

3. What is the function of IEEE 802.2 standard?

(Or) Write notes on logic link control?

The project 802 model takes a structure of an HDLC frame and divides in to two set function s.

One set contains logical address, control information and data.

These functions are called upper sub layer and the function by the LLC control protocol. & the data unit is called as protocol data unit.

4. Draw the PDU format?

DSAP SSAP Control Information

DSAP;-destination service access point.

SSAP:-source service access point.

The DSAP&SSAP are used to identify the protocol stacks.

If the first bit of DSAP is 0 then it is an individual one, &'1'indicates group one .so DSAP indicates whether the frame is individual or group one.

SSAP indicates whether communication is command or response.

Control field is same as that of HDLC frame, for I, S, U frames.

Information carries user data.

5. Explain why there are no physical address, flag or CRC fields in

PDU

The PDU has no flag field, no CRC, and no station address .because these fields are upper sub layers which is going to added with the lower sub layer.

6. Compare and contrast the SSAP and DSAP on the PDU with the

Source and destination address of the MAC frame?

The SSAP and DSAP are the address used by the LLC to identify the protocol stacks in sender and receiver.

I.e. SSAP indicates whether the frame is individual or group one, SSAP indicates whether the frame is command or response.

The source and destination address of provides the source and destination device information.

7. Write notes MAC layer?

MAC layer is the media access layer which contains the specific project 802 standards as (802.3), token bus (802.4), and Token ring (802.5).

8. What is Ethernet? (OR what is IEEE802.3?

The IEEE802.3 supports a LAN standard originally developed by Xerox and later extended by joint venture between digital equipment corporations, inter corporation and Xerox is called Ethernet.

Ethernet defines two categories.

<div style="text-align: center;">

1. Base band

2. Broad band

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9. What is the difference between base band and broad band?

The base band &broad band are the classification of Ethernet.

Base specifies a digital signal with Manchester encoding.

E.g. 10base5, 10base2, 10-baset, 1base5, 100-baseT

I.e. in 10base5

10àspecifies data rate in Mpbs

5à specifies maximum cable length or type of cable.

In broad band, the broad species analog signal with PSK encoding.

<div style="text-align: center;">E.g.: 10broad 36</div>

10. What is CSMA/CD?[April-2004]

<div style="text-align: center;">(OR)</div>

Write notes on collision detection?

CSMA/CD is the carrier sense multiple access with collision detection .any station may listen to the line to determine if the line is clear. If clear transmission can commence. If a collision occurs transmission stops and the process is repeated.

11. What is a collision?

Whenever multiple uses have unregulated access to single line, there is a danger of signal overlapping and destroying each other. Such over laps, which turn the signals in to unusable noise, are called collisions.

12. Compare persistent and non persistent CSMA. [NOV-2004]

In persistent CSMA, the terminal listens to the channel and waits for transmissions until it finds the channel idle.

In non persistent CSMA, after receiving the negative acknowledgement, the terminal waits a random time before retransmission. It is used in wireless LAN applications.

13. Write the implementation of Ethernet?

Thick Ethernet, Thin Ethernet, Twisted pair Ethernet, star LAN.

14. Write notes on switched, Fast, Gigabit Ethernet?

In switched Ethernet, a switch can direct a transmission to just the destination replaces the hub.

In fast Ethernet, the data rate is increased to 100Mbps, but the collision domain is reduced to 250 meters.

In Gigabit Ethernet, 1-Gbps data rate serves as a back bone to connect the Ethernet.

15. Define IEEE 802.4?

(OR)

Define token bus?

Token bus combines features of Ethernet and token ring. It combines the physical configuration of Ethernet and the collision free feature of token ring.

Token bus is a physical bus that operates as a logical ring using tokens.

It is used as a LAN in factory automation and process control

16. Define the features of IEEE802.5 (OR) Define the features of

Token ring?   (OR) How does a Token Ring LAN Operate?

Token ring resolves uncertainty by requiring that stations take turns to send data.

Each station may send data only during its turn. & only one frame is transmitted during each turn. This mechanism of rotation is called Token passing

A station may send data only when it has possession of the Token.

17. Mention the advantage of Token ring?

Main advantage of token ring is the flexible control over access that it provides.

18. What is the disadvantage of Token ring protocol? [NOV-2004]

The main disadvantage of token ring is the requirement for token maintenance.

Loss of the token prevents further utilization of the ring.

Duplication of the token can also disrupt ring operation.

One station must be selected as a monitor to ensure that exactly one token is on the ring and to ensure that a free token is reinserted, if necessary.

19. Write the function of IEEE802.1 standard?

This standard provides internet working information for LAN'S&MAN'S.

It is the internet working standard.

20. What is the maximum throughput of pure ALOHA?

$S = 1/2e$

UNIT – 4

TRANSPORT LAYER

1. What is the purpose of choke packet?
It is a packet send by a router to the source to inform it of congestion

2. Give some examples of applications where UDP is preferred over TCP?
In multicasting

Routes update protocol in RIP

3. Define congestion?
When load on network is greater than its capacity, there is a congestion of data packets. Congestion occurs because routers and switches have queues or buffers.

4. What is demultiplexing?
The job of delivering the data in a transport layer segment to the correct socket is called as demultiplexing

5. What is RTT?
It is an acronym of Route Trip Time. It is a measure of the time it takes for a packet to travel from a computer , across a network to another computer and back.

6. What is known as well known ports?
Well known ports are reserved for use of well known application protocols like HTTP and FTP.

7. Do TCP, UDP, or both compute RTT?

TCP does; but UDP does not.

8. List the flag used in TCP header?

TCP header consists of six flags. They are URG, ACK, PSH, RST, SYN, and FIN.

9. Why is there a UDP?
    i.   No connection establishment
    ii.   Small segment header
    iii. No congestion control

10. What is the segment?

Transport layer protocols send data as a sequence of packets. In TCP/IP these packets are called as segments.

11. What is a socket?

A port identifies a single application on a single computer.

Socket = IP address + Port number

12. What is the purpose of transport layer?
    a. Breaks messages in to packets
    b. Connection control
    c. Addressing
    d. Provide reliability

13. State two socket primitives for TCP and state their function?
A. Listen
B. Close

14. What is the consequence of having a time- out value that is too long?

A too long time out value will result in a sending host sitting idle where it should be resending in the case of lost packet of acknowledgement

15.Which windows is byte- oriented?

 TCP Windows

16. Give the parameters used in the system design?

Speed

Software overhead

Bandwidth

Network congestion

Minimize copying

17. Where we use the slow start method?

   Just after a TCP connection set up

When a source is blocked, waiting for the time – out

18. Which are the algorithms behind the adaptive retransmission?

Karn/Partridge algorithm

Jacobson/Karels algorithm

19. What is AIMD?

 Adaptive Increase, Multiplicative Decrease Control, It performs a slow increase in the congestion window size when the congestion in the network decreases.

20. Give the bandwidth utilization in congestion control?

 Bandwidth utilization = r/B

B = Link bandwidth

r= TCP transfer through put

UNIT – 5

APPLICATION LAYER

1. What is called as Public key encryption?

- In conventional method encryption and decryption key are same.
- In public key method encryption key is same but decryption algorithm is kept secret.

2. What is monoalphabetic and polyalphabetic substitution?   (OR)

   Define the types of substitution encryption?

- The monoalphabetic encryption algorithm simply adds a number to the ASCII code of the character; the decryption algorithm simply subtracts the same number from the ASCII code.
- In poly alphabetic substitution each occurrence of a character can have a different substitute .it finds the position of the character in the text and uses the character in the text and use that value in the key.

3. What is transposition encryption?

- In Transposition encryption the characters retain their plain text form but change their position to create the cipher text. The text is organized in to a two dimensional table, and the columns are interchanged according to the key.

4. Contrast straight compressed and expanded permutation?

- In straight permutation the number of bits in the input and output are preserved. Only the positions are interchanged.
- In compressed permutation the number of bits is reduced.
- In expanded permutation the number of bits is increased.

5. What is DES?or For private key encryption, discuss the keys and their ownership?

- DES is the data encryption standard was designed by IBM and adopted by the U.S government as the standard encryption method.
- Here only one key I used and the same key is used for encryption and decryption and both parties must agree the key before any transmission begins.

6. What is RSA encryption? or   Write about public key encryption?

- The RSA algorithm is the best technique used for public key encryption. It is Rivest,Shamir,Adleman(RSA)encryption.
- Here one party uses a public key the other party uses a secret key.ie one key is used for the encryption and only the other key must be used for decryption.

7. What is reciprocity of RSA?

The RSA algorithm is reciprocal. This means the bank can use the same secret key, KS to send a reply to the customer and the customer can decrypt the message using his own private key.

8. List the security services provided by the network. [Nov-04]

- Protecting data from being read by unauthorized persons.
- Preventing unauthorized persons from inserting or deleting messages.
- Verifying the sender of each message.
- Making it possible for users to send signed documents electronically.

9. What is known as Authentication?

- Authentication means verifying the identity of the sender. it tries to verify that a message is coming from an authentic sender and not from an imposter.
- Digital signature is one of the authentication method used today.

10. What is Data compression? What are the types?

- The data compression is the method to reduce number of nits.
- It is of two types

1. Lossless method (All information is recoverable)

2. Lossy method (Some information is lost)

11. What is the domain name system responsible for?

The DNS converts domain names (of the form in to IP numbers

12. What role does the DNS Resolver play in the DNS system?

It is responsible for making request of the local DNS server on behalf of clients.

13. Which algorithm is supported by SSL?

It supports multiple cryptographic algorithms.

14. What is the web browser?

It is a software program that interprets and displays the contents of HTML WebPages.

15. What are the basic functions of e-mail?

Composition, Transfer, Reporting, Displaying and Disposition

16. What is the virtual terminal?

It is a data structure maintained by either the application software or the local terminal.

17. What is SMTP used for?

The connection between sending mails.

18. What is mailing list?

It contains the addresses of destination users.

19. What is a URL?

A string identifier that identifies a page on the World Wide Web.

20. What is a post office protocol?

An e-mail protocol that allows retrieval of e-mail messages from an e-mail server using remote connection.