ANNA UNIVERSITY QUESTION BANK

UNIT 1

FUNDAMENTALS & LINK LAYER

PART A

1. State the major functions performed by the presentation layer of the ISO OSI model.(Nov Dec 2006)

Ans: Presentation layer is concerned with the format of data exchanged between peers, for example, whether an integer is 16, 32, or 64 bits long and whether the most significant bit is transmitted first or last, or how a video stream is formatted.

2. A sine wave has a frequency of 6 Hz. What is its period?(Nov Dec 2006)

Ans: Frequency is indirectly proportional to time. Consider the time 'T' and frequency 'freq'. Then, the formula is, T=1/freq = 1/6Hz=0.17 seconds.

3. Define the term Protocol and give its key elements. (Nov Dec 2007)

Ans: Protocol is used for communications between entities in a system and must speak the same language. Protocol is the set of rules governing the exchange of data between 2 entities. It defines what is communicated, how it is communicated, when it is communicated

Key elements of Protocol:

Syntax – It refers to the structure or format of data meaning the order in which they are presented.

Semantics – It refers to the meaning of each section of bit. How to do interpretation.

Timing – When data should be sent and how fast they can be sent.

4. State the purpose of layering in networks?(May Jun 2007)

Ans: A layer is a collection of related functions that provides services to the layer above it and receives services from the layer below it.

- *To execute the functions by each layer is independent.*

5. At which level of OSI model does repeaters, bridges, routers and gateways operate?(May Jun 2007)

Devices Layers

Repeater - Physical

Bridge - Physical, Data Link

Router - Physical, Data Link and Network

Gateway - All 7 layers

6. For n devices in a network, what is the number of cable links required for a mesh, ring, bus and star topology?(Nov Dec 2008)

Ans: Cable links required to make communication between 'n' network devices.

- *Links required for mesh topology = n(n-1)/2*
- *Links required for ring topology = n-1*
- *Links required for star topology = n*
- *Links required for bus topology = one backbone and n drop lines*

7. What are the two types of line configuration? (Nov Dec 2010)

Ans: Point to point line configuration and multipoint line configuration.

Point to point:

- *It provides a dedicated link between 2 devices.*
- *Entire capacity of the link is reserved for transmission between 3 devices only*
- *Eg: connection between remote control and TV's control system*

Multipoint:

- *Also called as multi drop connection*
- *Here the channel capacity is shared*
- *If many devices share the link simultaneously it is called spatially shared connection.*

8. What do you mean by error control? (Nov Dec 2010)

Ans: Error control refers to mechanism to detect and correct errors that occur in the transmission of frames.

9. What is flow control? (Nov Dec 2011)

Ans: Flow control is a technique for assuring that a transmitting entity does not overwhelm a receiving entity with data. Flow control—a feedback mechanism by which the receiver is able to throttle the sender. Such a mechanism is used to keep the sender from overrunning the receiver, i.e., from transmitting more data than the receiver is able to process.

10. Define Error detection and correction. (Nov Dec 2011)

Ans: Error detection: Sender transmits every data unit twice. Receiver performs bit-by-bit comparison between that two versions of data. Any mismatch would indicate an error, which needs error correction.

11. What are the issues in data link layer? (Nov Dec 2012)

Ans: The Data Link Layer is the protocol layer which transfers data between adjacent network nodes in a wide area network or between nodes on the same local area network segment. The Data Link Layer provides the functional and procedural means to transfer data between network entities and might provide the means to detect and possibly correct errors that may occur in the Physical Layer. Examples of data link protocols are Ethernet for local area networks (multi-node), the Point-to-Point Protocol (PPP), HDLC and ADCCP for point-to-point (dual-node) connections.

12. What is ARQ? (Dec 10)

Ans: Automatic repeat request(ARQ).In error control mechanism when an error is detected in an exchange, specified frames are retransmitted. This process is called ARQ.

13. What are the functions of application layer? (May 11)

Ans: User to access information on the network through an application. This layer is the main interface for the user to interact with the application.

14. Define bit stuffing. (May 11)

Ans: Each frame begins and ends with a special bit pattern called flag byte. Whenever sender data link layer encounters five consecutive ones in the data stream, it automatically stuffs a 0 bit into the outgoing stream.

15. Difference between circuit switching and packet switching. (May 11)

circuit switching packet switching

Physical connection b/w sender and receiver No Physical connection b/w sender and receiver All packets use same path All packets use different path Waste of bandwidth is possible Waste of bandwidth is not possible Congestion occurs for per minute Congestion occurs for per packet

16. What is HDLC? (May 12)

Ans: It is a protocol that implements ARQ mechanisms. It supports communication over point – to – point or point – to – multipoint links.

17. Define a layer. (Dec 13)

Ans: A layer is a collection of related functions that provides services to the layer above it and receives services from the layer below it.To executed the functions by each layer is independent.

18. What do you mean by framing? (Dec-13)

Ans: The DLL translates the physical layers raw bit stream into discrete units called frames. Framing in DLL separates messages from one source to a destination, or from other messages to other destination, by adding sender and receiver address.

19. Which of the OSI layers handles each of the following (a) Dividing the transmitted bit streams into frames (b) Determining which route through the subnet to use (Nov/Dec 2009)
20. What is the level of reliability provided by the simple parity scheme in error detection? (Nov/Dec 2009)
21. What is Modulo-2 arithmetic (Nov/Dec 2007)
22. Define SONET (Nov/Dec 2007)
23. List out the five components of data communication Systems (April/May 2010,Nov/Dec'12)
    Sender, Receiver, Message, Protocol, Transmission Media
24. Differentiate : Internet and Intranet (April/May 2010)
25. What are the reponsiblities of data link layer in internet model? (April/May 2010)
26. Which ARQ mechanism utilizes pipelining? (April/May 2010)
27. What is the mechanism of stop and wait protocol (Nov/Dec'12)

PART B

1. (i) What is a Protocol? List the three key elements of a protocol.(4)

(ii) With relevant examples differentiate between simplex, half duplex and full duplex communication. (4)

(iii) A Sine wave completes one cycle in 25 go, what is its frequency? Express the frequency in KHz. (4).

Consider the given time 'T' is 25 μs.

To calculate the frequency we have a formula,

Frequency = 1/T

=1/0.000025 =40000 (or) 40 KHz.

(iv) A digital signal has a bit interval of 40 microseconds. What is the bit rate? Express the bit rate in Steps. (4) (Nov Dec 2006).

Consider the given bit interval is 40 μs. The bit rate and bit intervals are inversely proportional to each other. So, we can get the formula to calculate the bit rate is,

Bit rate=1/bit

interval =1/0.000040 =25kbps.

2. Explain Layers in OSI/ model. (16) ((Dec 08, Nov/Dec 2010, Dec 2011,May 12, N/D 2009,April/May2010,Nov/Dec 2012)

3. (i)Explain about the transmission modes available for data flow.
(ii) Explain the categories of networks. (Nov/Dec 2007,Nov/Dec 2012).

4. Explain in detail the error detection and error corrections. (Nov Dec 2010, 2012, May 12)