QUESTION BANK

UNIT I   Introduction to Networks

DEC 2010

1 a. What is data communication? List and explain the five components of a data communication system, with examples. **07 M**

b. discuss the OSI-ISO layered model. Bringing out the functionalities of each layer. **10 M**

c. define the key element of a protocol. **03 M**

May/June 2010

2 a. What is data communication? What are its characteristics and components? Explain. 06M

b. give the comparison between LAN,MAN and WAN with an example.**06M**

c. describe with a neat diagram. The functionalities of each layer in the TCP/IP model. **08M**

DEC 09/Jan 10

3 a. What is data communication? What are its four important fundamental characteristics? **06M**

b. What is a protocol? What are its key elements? **02M**

c. Explain OSI reference model. With a neat figure explain**. 08M**

d. Differentiate between:**04M**

    i.   ARP and RARP
   ii.   ICMP and IGMP
  iii.   UDP and TCP

June/July 2010

4 a. with neat diagram explain mesh topology with applications of each.**06M**

b. what are standards ? Name any four standard organizations.**06M**

c. explain OSI reference model with functions of following layers. **08M**

i) Physical layer   ii) Data link layer   iii) Network layer

Dec 08/Jan.09

5 a. what is data communication? What are its characteristics? Explain. **06M**

b. define the following terms : i) protocol   ii) internet   **04M**

c. describe with neat diagram the functionalities of each layer in the OSI model. **10M**

UNIT – II   Physical layer-1

DEC 2010

1 a. an analog signal has a bandwidth of 40 kHz. If we use four levels in the signal. What is the minimum bandwidth of the digital signal? **04M**

b. what is the Nyquist sampling rate for each of the following signals?

i) A low pass signal with bandwidth of 200 kHz.

ii) A band pass signal with bandwidth of 300 kHz having lowest frequency of 200 kHz. **04M**

c. write a descriptive note on the three causes of transmission impairment. **12M**

May/June 2010

2 a. explain the transmission modes **06M**

b. we want to digitize the human voice. What is the bit rate, assuming 8 bits per sample? **04M**

c. discuss 8b/10b coding scheme **.04M**

d. explain the delta modulation.**06M**

DEC 09/Jan 10

3 a. Suppose an application layer wants to send L-bytes message to its peer process using the existing TCP connection. The TCP consists of message plus 20 bytes of header. The segment is encapsulated into IP packet that has an additional 20 bytes of header. The IP packet in turn goes inside the Ethernet frame that has 18 bytes of header and trailer. What percentages of the transmitted byte in the physical layer correspond to the message information? L=100 byte. **06M**

b. define bandwidth. A periodic signal has a bandwidth of 20 Hz. The highest frequency is 60Hz. What is the lowest frequency? Draw the spectrum, if the signal contains all frequencies of the same amplitude.**04M**

c. explain briefly, with neat figures, the two approaches for digital transmission.**08M**

d. A signal travels through an amplifier and the power is increased 10 times. Calculate the power gained. **02M**

June/July 2010

4 a. explain three causes of transmission impairments. **06M**

b. describe with neat waveform any two polar line coding schemes.**06M**

c. give data rate formula suggested by Nyquist and Shannon. Low pass communication has BW of 1 m Hz .what is the Shannon capacity of the channel if SNR is 40 db? What bit rate is attained using 8-level pulses? **08M**

Dec 08/Jan.09

5 a. calculate the Shannon channel capacity in the following cases: **06M**

> BW 20 kHz SNR dB 40
> BW =200 kHz SNR dB 6

b. A file contains 3 million bytes. How long does it take to download this file using a 100 kbps channel? **04M**

c. define line coding. Describe Unipolar NRZ, polar NRZ-L, Bipolar AMI and Manchester encoding by applying on the information sequence 101011100. **10M**

Unit-III   Physical layer 2 and switching

DEC 2010

1 a. what is time division multiplexing? Explain how statistical TDM overcomes the disadvantages of synchronous TDM. **08M**

b**.** an analog signal has a bit rate of 10000 bps and the bandwidth of 2000 baud. How many data elements are carried by each signal element? How many signal elements do we need? **04M**

c. Explain phase shift keying in detail. **08M**

May/June 2010

2 a. an analog signal has a bit rate of 8000bps and a baud rate of 1000 baud. How many data elements are carried by each signal element? How many signal elements do we need? **04M**

b. define synchronous TDM. **12M**

c. explain the amplitude modulation.**04M**

DEC 09/Jan 10

3 a. A voice grade channel of a telephone network has a bandwidth of 3.4 kHz.**06M**

i)   Calculate channel capacity for S/N=30Db
ii)   Calculate S/N required to support information transfer at 4800 bps.

b. What is FDM? Briefly explain its multiplexing and demultiplexing process.**06M**

c. explain briefly the two spread spectrum techniques.**08M**

June/July 2010

4 a. With a neat waveform. Explain three methods of digital to analog conversion. Draw waveform with input data110100.**06M**

b. what is multiplexing? With neat diagram explain FDM.**06M**

c. what is TDM ? Four sources create 250 characters per second. The frame contains one character from each source and one extra bit for synchronization. Find i) the data rate of each source. ii) duration of each character in each source.iii) the frame rate iv) duration of output frame. v) Frame size in bits. vi) Data rate of link. **08M**

Dec 08/Jan.09

5 a. we have four sources, each creating 250 characters /sec. if the interleaved unit is one character and 1 synchronization bit is added to each frame, find   **12M**

i)   The data rate of each source.
ii)   The duration of each character in each source.
iii)   The frame rate.
iv)   The duration of each frame.
v)   The no of bits in each frame.
vi)   The data rate of the link.

b. define synchronous TDM. **02M**

c. describe ASK, FSK and PSK mechanisms and apply them over the digital data 101101. **06M**

UNIT- IV   Data Link Layer-1

DEC 2010

1 a. what is reflection? Briefly explain the fiber optic cable media. With a neat sketch. **08M**

b. Draw a CRC encoder and decoder for CRC code with C(7,4).Also explain how this CRC design works, with an example. **10M**

c. Define line of sight propagation. **02M**

May/June 2010

2 a. briefly explain twisted pair cable and optical fiber cable. With their applications **.10M**

b. Explain the checksum with an example. **06M**

c. explain the types of errors. **04M**

DEC 09/Jan 10

3 a. explain briefly the fiber optic cable with a neat figure**. 08M**

b. find the codeword C(x) for the information $d(x)=x^3 + 1$ with the generator polynomial $t(x)= x^3 +x+1$. **06M**

c. what is internet checksum? With an example

June/July 2010

4 a. Describe the physical and transmission characteristics of the following:

   i.   Twisted pair cable
   ii.   Fiber optic cable

b. What is hamming distance? Explain simple parity check code C (5, 4) with d min =1. How many bits can be corrected? **06M**

c. What is CRC? If the generating polynomial for CRC code is x4+x3+1 and message word is 11110000 determine check bits and coded word. **08M**

Dec 08/Jan.09

5 a. briefly explain the coaxial cable and optical fiber with their application. **10M**

b. explain how CRC is used in detecting errors for the following polynomial, g(x)=x4+x+1. Consider the information sequence 1101011011. **10M**

i) Find the codeword corresponding to this sequence.

ii) If the codeword has error in third bit. What does receiver obtain when it does its error checking?

UNIT- V   Data Link Layer-2

DEC 2010

1 a. List the protocols for noisy channel s. explain stop and wait protocol for noiseless channels. **08M**

b. Define piggybacking and its usefulness. **04M**

c. Write explanatory note s on the different phases of PPP **08M**

May/June 2010

2 a. explain the selective repeat and stop and wait ARQ. **10M**

b. discuss HDLC protocol. **10M**

DEC 09/Jan 10

3a. explain briefly with neat figures stop and wait ARQ and Go back N ARQ. **12M**

b. explain the frame format and transitional phases of point to point protocol. **08M**

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Differentiate between character oriented protocol and bit oriented protocol frame format for framing. **06M**

Explain salient features of: **08M**

  i.   stop and wait protocol
  ii.   stop and wait ARQ protocol

Briefly explain about point to point protocol. **06M**

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5 a. explain selective repeat ARQ. Justify how selective repeat ARQ outperforms Go-Back-N and Stop-and-Wait ARQ. **10M**

b. explain point to point protocol frame format. Also briefly describe different transition phases of PPP in establishing. **10M**

UNIT- VI   Multiple Access & Ethernet

DEC 2010

1 a. Describe the different controlled access methods. **10M**

1b. Explain 802.3 MAC frame format and frame length. **10M**

May/June 2010

2 a. Explain   i) CSMA   ii) CSMA/CD. **10M**

2b. what do you mean by channelization? Explain the protocols used for channelization. **10M**

DEC 09/Jan 10

3 a. A network transmits 200 bit frame on a shared channel of 200 kbps. For aloha and slotted aloha, what is the

  a. Requirement to make the frame collision free?
  b. Throughput if the system produces 1000 frames/sec? **08M**

3b. define channelization and list its three protocols? **10M**

3c. how does p-persistent method improve efficiency? **02M**

June/July 2010

4 a. what is random access? Explain following random access protocols.

  i)   slotted ALOHA   ii) CSMA/CD   **06M**
  c. What is channelization? Explain CDMA**. 06M**
  d. Describe frame format for IEEE 802.3 MAC frame. What are the salient features of fast Ethernet? **08M**

Dec 08/Jan.09

5 a. Explain the following random access protocols: i) CSMA   ii) CSMA/CD. **10M**

5b. Discuss 802.3 MAC frame format. Mention the restriction imposed on minimum and maximum lengths of a 802.3 frame. **10M**

UNIT – VII   Wireless LANs

DEC 2010

1 a. Discuss the 802.11 MAC layer frame format **08M**

b. Differentiate bus back-bone from star back bone. Explain each in detail**. 10M**

c. Differentiate between amplifier and repeater.**02M**

May/June 2010

2 a. explain the IEEE 802.11 architecture.   **08M**

b. how does a virtual LAN helpful in providing security and reduce the network traffic? **08M**

c. Explain the bridges. **04M**

DEC 09/Jan 10

3 a. explain with a neat figure 802.3 MAC frame format. **08M**

b. explain the hidden and exposed station problem in IEEE 802.11. **12M**

June/July 2010

4   a. Describe the MAC layers in IEEE 802.11 standard. **06M**
    b.   In brief explain blue tooth layers. **06M**
    c.   Bring out difference between repeaters, bridges, routers and gateways. **08M**

Dec 08/Jan.09

5a. discuss Bluetooth technology**. 10M**

5b. explain the working mechanism of following devices used to connect LANs. **10M**

UNIT VIII   CELLULAR TELEPHONY

DEC 2010

1 a. Explain in detail the architecture of a SONET system. **10M**

b. Write a note on byte interleaving.**04M**

c. Give the architecture of ATM. Show how VPs and VCs are established.**06M**

May/June 2010

2 a. explain the SONET/SDH layer and frames. **12M**

b. Find the data rate and duration of an STS-1 signal. **04M**

c. Explain the AMPS. **04M**

DEC 09/Jan 10

3 a. explain briefly the three categories of satellites. **10M**

b**.** explain briefly STS-1 frame format **10M**

June/July 2010

4a. explain SONET multiplexing. **06M**
   b. With neat diagram describe ATM architecture.**06M**
   c. Discuss SONET STS-1 frame format. Find data rate of an STS-3 signals.**08M**

Dec 08/Jan.09

5   a. what are the design goals of ATM? Briefly describe ATM layers. **12M**
       b. what is bit stuffing and unstuffing ? Apply bit stuffing to the sequence:
       01101111111111100 apply unstuffing: 0111111000011101111101111101100111110. **08M**