

Code No: 07A7EC13

R07**Set No. 2****IV B.Tech I Semester Examinations November 2010****COMPUTER NETWORKS**

**Common to Bio-Medical Engineering, Electronics And Telematics,
Electronics And Instrumentation Engineering, Electronics And
Communication Engineering**

Time: 3 hours**Max Marks: 80**

**Answer any FIVE Questions
All Questions carry equal marks**

1. What is a token? Discuss the protocol of token ring LAN in general. Discuss with example how priority is implemented in a token ring LAN? [16]
2. What is adaptive routing. Is Distance vector routing adaptive algorithm or not. Justify your answer. Explain in detail Distance vector routing. [16]
3. Explain in detail IDEA. [16]
4. (a) Discuss about transmission in ATM Networks?
(b) Discuss the importance of electromagnetic spectrum in communication? [8+8]
5. (a) Why IPv6 uses extended headers? Explain different IPv6 extension headers.
(b) What are the advantages of IPv6 over IPv4? [10+6]
6. (a) In TCP Why three-way handshake is required for connection establishment and release.
(b) Why TCP is not suitable for request-reply type of transfers?
(c) As application developer under what circumstances you use TCP and under what circumstances you use UDP? [6+5+5]
7. (a) Discuss the error control technique which is commonly used in data network. What value of N is used in go-back-N ARQ technique used in ARPANET and why?
(b) Imagine that you are writing the data link software for a line used to send data to you, but not from you. The other end uses HDLC, with a 3-bit sequence number and a window size of seven frames. You would like to buffer as many out of sequence frames as possible to enhance efficiency, but you are not allowed to modify the software on the sending side. Is it possible to have a receiver window greater than one, and still guarantee that the protocol will never fail? If so, what is the largest window that can be safely used? [8+8]
8. (a) Compare point-to-point channels with broadcast channels along with suitable examples.
(b) A collection of five routers is to be collected in a point-to-point subnet. Between each pair of routers, the designers may put a high speed line, a medium-speed line, a low-speed line, or no line. If it takes 100ms of computer time

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to generate and inspect each topology, how long will it take to inspect all of them to find the one that best matches the expected load? [8+8]

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1. (a) How Tunneling helps in connecting two different networks?
(b) How routing in inter-network is different from routing in subnet? [8+8]
2. (a) What is substitution cipher? How it works? Using statistical properties how do you break cipher text.
(b) How transposition ciphers are different from substitution ciphers? Explain the columnar transposition with example. [8+8]
3. Describe the following:
(a) ARPANET
(b) Novell Netware. [8+8]
4. (a) Which IEEE 802 specification is similar to the Ethernet standard? How CSMA/CD protocol is different than that of Ethernet protocol? How does CSMA/CD resolve the problem of line contention?
(b) A group of N stations share a 56-kbps pure ALOHA channel. Each station outputs a 1000-bit frame on an average of once every 100 sec, even if the previous one has not yet been sent.(e.g., the stations are buffered). What is the maximum value of N? [8+8]
5. (a) How the complexity at Network layer & Transport layer varies with connection oriented and connectionless service.
(b) Suppose Network layer provides connection less service, Transport layer connection oriented service, then how reliability is achieved?
(c) How Virtual circuit is different from Physical connection? [8+4+4]
6. (a) What is the checksummed frame transmitted if the message is 1101011011 and the generator polynomial is $x^4 + x + 1$ using CRC.
(b) Give the detailed description of HDLC frame format? [8+8]
7. (a) Why does UDP exist? Would it now have been enough to just let user processes send raw IP packets?

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- (b) A group of N users located in the same building are all using the same remote computer via an ATM network. The average user generates L lines of traffic (input + output) per hour, on the average, with the mean line length being P bytes, excluding the ATM headers. The packet carrier charges C cents per byte of user data transported, plus X cents per hour for each ATM virtual circuit open. Under what conditions is it cost effective to multiplex all N transport connections onto the same ATM virtual circuit, if such multiplexing adds 2 bytes of data to each packet? Assume that even one ATM virtual circuit has enough bandwidth for all the users. [8+8]
8. (a) Is it desired to send a sequence of computer screen images over an optical fiber. The screen is 480×640 pixels, each pixel being 25 bits. There are 60 screen images per second. How much bandwidth is needed, And how many microns of wavelength are needed for this band at 1.30 microns? [8+8]
- (b) Discuss about the functions of ATM layers and sub layers? [8+8]

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1. (a) Discuss about fast Ethernet cabling.
(b) Explain various token bus control frames. [8+8]
2. (a) Explain Dijkstra's shortest path algorithm.
(b) Consider graph given figure 2b. Compute the shortest path from A to D. [8+8]

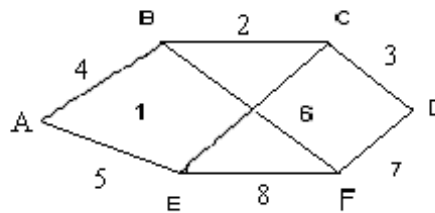


Figure 2b

3. How Authentication is implemented using Kerberos? [16]
4. (a) Illustrate how a telephone conversation is done with the service primitives.
(b) Explain the proprietary protocol stack used in Novell Netware. [8+8]
5. (a) A block of bits with n rows and k columns uses horizontal and vertical parity bits for error detection. Suppose that exactly 4 bits are invented due to transmission errors. Derive an expression for the probability that the error will be undetected.
(b) Explain about the three kinds of frames in HDLC protocol. [8+8]
6. (a) Differentiate between the following:
 - i. Category 3 twisted pairs & Category 5 twisted pairs
 - ii. Broad band networking using dual cable & single cable
 - iii. Single mode fiber and multi mode fiber
- (b) Which is more efficient, circuit switching or packet switching? Why? In a two byte address field, what is the maximum number of permanent virtual circuits possible? What about a three byte address? [9+7]

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7. (a) What is Pay load? What is the payload size of the maximum length message that fits in a single AAL 3/4 cell?
- (b) When a 1024 bytes message is sent with AAL 3/4, what is the efficiency obtained? In other words, what fraction of the bits transmitted are useful data bits? Repeat the problem for AAL 5. [6+10]
8. (a) What are the advantages of Token bucket over Leaky bucket algorithm?
- (b) A Computer on a 6-MBPs network is regulated by a token bucket. The token bucket is filled at a rate of 1KBps. It is initially filled to capacity with 8 megabits. How long the computer transmits at the full 6MBps.
- (c) An IP datagram using strict source routing option has been fragmented. Do you think the option is copied into each fragment, or is it sufficient to just put it in the first fragment. Explain you answer. [8+4+4]

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1. (a) Discuss in detail about space division switches?
(b) With a neat diagram explain ISDN system for home use? [8+8]
2. (a) Mention and discuss the functioning of data link layer protocols in detail.
(b) Data link protocols almost always put the CRC in a trailer, rather than in the header. Why? [12+4]
3. What is Digital Signature? Explain the following Digital signature approaches.
(a) Digital signatures with Big brother
(b) Digital signatures with Public key cryptography. [8+8]
4. (a) Distinguish among LAN, MAN, WAN and Internet.
(b) What are the two protocols that are defined at the transport layer of the TCP/IP reference model? Mention their applications? [12+4]
5. (a) What is flooding. How flooding can be used for routing packets. In what situations flooding is used or preferred. What is the major disadvantage of flooding. Suggest solutions for it.
(b) Among all routing algorithms, flooding results in shortest delay. Comment. [12+4]
6. (a) Explain the protocol designed for wireless LANs.
(b) Imagine two LAN bridges, both connecting pair of 802.4 networks. The first bridge is faced with 1000 512-byte frames per second that must be forwarded. The second is faced with 200 4096-byte frames per second. Which bridge do you think will need the faster CPU? Discuss. [8+8]
7. (a) What is the role played by threshold value in congestion control?
(b) Assume network with links having abundant bandwidth. What are the pros and cons of using exponential increase and linear increase of congestion window? What happens if bandwidth is limited?
(c) Explain how flow control is different from congestion control. [2+6+8]
8. (a) When RARP is required. Explain how it works. What is the limitation of RARP? How BOOTP provides solution for it?

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- (b) What is the difference between classful addressing and classless addressing?
How classless addressing results in decrease in the table size?
- (c) Give an argument why the leaky bucket algorithm should allow just one packet per tick, independent of how large the packet is. [6+5+5]

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