

Code No: 07A7EC13

**R07****Set No. 2**

IV B.Tech I Semester Examinations, MAY 2011

**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

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1. What is adaptive routing. Is Distance vector routing adaptive algorithm or not. Justify your answer. Explain in detail Distance vector routing. [16]
2. Describe the following:
  - (a) ARPANET
  - (b) Novell Netware. [8+8]
3. (a) What is public key cryptography? What are the necessary conditions for public key cryptography?  
 (b) Explain RSA algorithm with example? [8+8]
4. (a) Why IPv6 uses extended headers. Explain different IPv6 extension headers?  
 (b) What are the advantages of IPv6 over IPv4? [10+6]
5. (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]
6. (a) What is the purpose of sequence numbers in TCP Segment?  
 (b) Why padding is required for TCP Segment?  
 (c) Write short notes on TCP timers. [4+4+8]
7. (a) Explain any two protocols that resolve the contention for the channel with out any collisions at all?  
 (b) A very heavily loaded 1-km-long, 10-Mbps token ring has propagation speed of 200 m/ $\mu$ sec. Fifty stations are uniformly spaced around the ring. Data frames are 256-bits, including 32 bits of overhead. Acknowledgements are piggybacked onto the data frames and are included as spare bits within the data frames and are effectively free. The token is 8 bits. Is the effective data rate of this higher or lower than the effective data rate of a 10-Mbps CSMA/CD network? [8+8]

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8. (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]

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1. (a) Discuss in detail about Time division switches?  
 (b) With a neat diagram explain ISDN system with a PBX for use in large businesses? [8+8]
2. (a) Explain how IP can be used over ATM?  
 (b) What are ATM service categories? [8+8]
3. (a) What is WWW? What is web page? What is hyper text? What is hyper link? How browser is used to access web pages?  
 (b) What is hypermedia? If a page contains hyper media, how its contents are viewed?  
 (c) What is URL? What are its parts? Explain with an example? [6+5+5]
4. (a) Discuss the various kinds of supervisory frames in HDLC?  
 (b) Consider the operation of sliding window protocol using selective repeat over a 1-Mbps error-free line. The maximum frame size is 1000 bits. New packets are generated about 1 second apart. The timeout interval is 10msec. If the special acknowledgement timer were eliminated, unnecessary timeouts would occur. How many times would the average be transmitted? [8+8]
5. (a) Explain different ways in which networks differ.  
 (b) What are the two styles of inter-networking? Explain. [6+10]
6. (a) The major problem with Distance vector algorithm is count to infinity. How exchange of complete path from router to Destination instead of delay, helps in solving count to infinity problem.  
 (b) What are the advantages of adaptive routing approach over non adaptive routing. [10+6]
7. (a) Differentiate between the following:
  - i. Connection less and Connection oriented services
  - ii. Point-to-Point Vs Broadcast type of networks
 (b) What is the difference between a confirmed service and an unconfirmed service? For each of the following, tell whether it might be a confirmed service, an unconfirmed service, both or neither

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- i. Connection establishment
  - ii. Data transmission
  - iii. Connection release. [8+8]
8. (a) How is a token ring managed in case of:
- i. Loss of token and
  - ii. Failure of active monitor.
- (b) A 4-mbps token ring has a token holder timer value of 10 msec. What is the longest frame that can be sent on this ring? [10+6]

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1. (a) Compare and contrast RZ and bipolar AMI?  
 (b) Differentiate between optical fiber and coaxial cables? [8+8]
2. (a) Give a detailed description of the Novell Netware reference model.  
 (b) With suitable examples explain simplex, half-duplex & full-duplex communication. [10+6]
3. (a) What is the necessity of ATM adaptation layer?  
 (b) Compare real time services & non real time services of ATM?  
 (c) What are sub layers of ATM adaptation layer and explain? [4+4+8]
4. (a) Discuss the principle of operation of control token MAC method and with the aid of diagram. Explain how it may be used with both a bus and ring network topology?  
 (b) A LAN uses Mok and Ward's version of binary countdown. At a certain instant, the ten stations have the virtual station numbers 8, 2, 4, 1, 7, 3, 6, 9, and 0. The next three stations to send are 4, 3, and 9, in that order. What are the new virtual station numbers after all three have finished their transmissions? [8+8]
5. (a) Suppose that instead of using 16 bits for the network part of a class B address 20 bits have been used. How many class B networks would there have been.  
 (b) A Class B network on the internet has a subnet mask of 255.255.240.0 what is the maximum number of hosts per subnet?  
 (c) Explain routing in ATM networks. [4+4+8]
6. (a) Explain any two applications for which flooding is preferred over Distance vector routing.  
 (b) If network topology never changes, which of the routing protocols, Shortest path routing & Distance vector routing is preferred and why. [8+8]
7. (a) Why DNS uses distributed data bases?  
 (b) How do you make web pages dynamic?

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- (c) What is the functionality that is supported by user agent? [5+6+5]
8. (a) Consider an error-free 64 kbps satellite channel used to send 512 byte data frames in one direction, with very short acknowledgements coming back the other way. What is the maximum throughput for window sizes 1,7,15 and 127?
- (b) What is pipelining? What are its advantages? What are the issues that raises when pipelining frames over an unreliable communication channel? Mention the approaches to deal with these errors? [8+8]

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1. What are the steps involved in congestion control? Explain. [16]
2. (a) "Although wireless networking and mobile computing are often related, they are not identical". Justify the statement.  
 (b) With suitable examples compare point-to-point channels and broadcast channels? [8+8]
3. (a) How POP works? What are the advantages of IMAP over POP?  
 (b) What is the role played by message transfer agent? Explain. [6+10]
4. (a) What signal-to-noise ratio is needed to put a T1 Carrier on a 50-KHz line.  
 (b) Discuss about the underlying technology that makes B-ISDN possible? [6+10]
5. (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]
6. (a) What is flow control? Discuss some flow control mechanisms?  
 (b) Discuss the concept of sliding window protocols? What is piggybacking? [8+8]
7. (a) Why does UDP exist? Would it now have been enough to just let user processes send raw IP packets?  
 (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]

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8. Assume nodes in the network are mobile. Explain how Distance vector routing works in such an environment. [16]

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