

**III B.Tech. II Semester Supplementary Examinations,
November/December -2005
COMPUTER NETWORKS
(Common to Computer Science & Engineering, Information
Technology, Electronics & Control Engineering, Computer Science & Systems
Engineering and Electronics & Computer Engineering)
Time: 3 hours Max Marks: 80**

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

1. (a) With a neat diagram, explain the functionality of layers, protocols and interfaces.
(b) What is the difference between connection-oriented and connectionless switching [8+8]
2. (a) Explain the multiple access protocol using which the stations abort their transmissions as soon as they detect a collision?
(b) Explain Design issues of DLL Protocols. [8+8]
3. (a) Explain in detail the operation of slotted Aloha?
(b) A Ten thousand air line reservation station is competing for the line of single slotted Aloha channel. The average station makes 18 requests/hour. A slot is 125μ sec, What is approximate total channel load. [8+8]
4. (a) Explain the operation of SLIP.
(b) Write different types of LCP packets that are defined in RFC 1661. [8+8]
5. (a) What is congestion control of a network? How does it differ from flow control? Discuss a method of congestion control [2+3+3]
(b) Explain with the help of a state diagram how connection management is done in the transport layer? [8]
6. (a) Explain various ATM service categories in detail?
(b) Draw the structure of ATM AAL and explain? [8+8]
7. (a) In order to overcome the problem of sequence numbers wrapping around while old packets still exist, one could use 64-bit sequence numbers. However, theoretically, an optical fibre can run at 75 Tbps. What maximum packet lifetime is required to make sure that future 75 Tbps networks do not have wraparound problems even with 64-bit sequence numbers? Assume that each byte has its own sequence number, as TCP does.
(b) The maximum payload of a TCP segment is 65,515 bytes. Why such a strange number was chosen? [8+8]

8. (a) Explain Breaking DES in secret key algorithms.
- (b) What is IDEA (International Data Encryption Algorithms). Explain it with a neat diagram. [8+8]

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1. (a) Write short notes on interfaces and services of ISO layers.
(b) Two networks each provide a reliable connection oriented service. One of them offers a reliable byte stream and other offers a reliable message stream. Are they identical? If so, why is distinction made? If not give an example of how they differ?
[8+8]
2. (a) Why does ATM use small fixed-length cells. [4]
(b) List the advantages and disadvantages of having international standards for network protocols. [6]
(c) A system has an N-layer protocol hierarchy. Application generate messages of length M bytes. At each of the layers, an h-byte header is added. What fraction of the network bandwidth is filled with the header? [6]
3. (a) Explain source routing bridges in detail?
(b) Compare virtual circuits and datagram subnets? [8+8]
4. (a) Explain the role of Discovery Frames in source Routing bridges in detail.
(b) Explain the algorithm used in Transparent bridges. [8+8]
5. (a) What is tunneling? Can tunneling be used in datagram subnets? If so, how? [2+3+5]
(b) Give the format of UDP segment and TCP segment? Explain when UDP is preferred to TCP? [8]
6. (a) Discuss the functions of the communication subnet to provide datagram services. [5]
(b) Explain selective flooding and discuss some of its practical usage. [6]
(c) Give the format of IPv6 header. [5]
7. (a) Consider a situation when you are measuring the time to receive a TPDU. When an interrupt occurs, you read out the system clock in milliseconds. When the TPDU is fully processed, you read out the clock again. You measure

0 msec 270,000 times and 1 msec 730,000 times. How long does it take to receive a TPDU?

- (b) Hazard a guess at what the field sizes for AAL 2 were, before they were pulled from the standard. [8+8]

8. (a) Explain any two encryption techniques in detail?

- (b) Explain RFC 822 header fields if MIME? [8+8]

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1. (a) What is the difference between a service point address, a logical address and a physical address?.
- (b) What are the responsibilities of the network layer? Explain them. [8+8]
2. (a) Why does ATM use small fixed-length cells. [4]
- (b) List the advantages and disadvantages of having international standards for network protocols. [6]
- (c) A system has an N-layer protocol hierarchy. Application generate messages of length M bytes. At each of the layers, an h-byte header is added. What fraction of the network bandwidth is filled with the header? [6]
3. (a) Briefly discuss five key assumptions in Dynamic channel allocation in LANs and MANs.
- (b) Consider the delay of pure ALOHA Vs Slotted ALOHA at low load. Which one is less? Explain your answer. [8+8]
4. (a) Explain the role of Discovery Frames in source Routing bridges in detail.
- (b) Explain the algorithm used in Transparent bridges. [8+8]
5. (a) Why does the max packet life time, T have to be large enough to ensure that not only the packet, but also its acknowledgements have vanished. [5]
- (b) Give potential disadvantage when Nagle's algorithm is used on a badly congested network. [6]
- (c) Discuss the advantages and disadvantages of credits Vs Sliding window protocols. [5]
6. (a) What is the drawback in running TCP/IP over ATM. [5]
- (b) Give the structure of concatenated virtual circuits for Internetworking. [5]
- (c) Discuss the goals of IPv6. [6]
7. (a) 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 paise per byte of user data transported plus X paise per hour for each ATM virtual circuit open. Under what conditions it is 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 sufficient bandwidth for all the user

- (b) What are blocking calls, primitives and non-blocking primitives? [8+8]
8. (a) Briefly discuss Triple Encryption using DES.
- (b) What is SNMP? Briefly discuss its message types. [8+8]

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1. (a) What does negotiation mean, when discussing network protocols? Give an example of it. [5]
(b) What are two reasons for using layered protocols ? [5]
(c) Write short notes on interface, service and protocol. [6]
2. (a) What is the remainder obtained by dividing $X^7 + X^5 + 1$ by the generator polynomial $X^3 + 1$? [5]
(b) Data link protocol almost always put the CRC in a trailer, rather than in a header, why? [5]
(c) Channel has a bit rate of 4 kbps and a propagation delay of 20msec. For what range of frame sizes does stop and wait give an efficiency of at least 50 percent ? [6]
3. (a) Discuss the situations where bridges are used? Explain any one type of bridge in details?
(b) What are the problems which caused demise of distance vector routing? Explain the algorithm that replaced it? [8+8]
4. (a) Explain leaky bucket algorithm for traffic shaping?
(b) Explain any five transport layer service primitives in detail? Mention the socket primitive used in Berkeley Unix for TCP? [8+8]
5. (a) Discuss the two styles of internetworking?
(b) Explain TCP segment header in detail? [8+8]
6. (a) What is fragmentation? Why is it important in internet working? Explain transparent and Non-transparent fragmentations. [10]
(b) Draw & Explain the IPV6 header format. [6]
7. (a) Write Brief note on TCP timer management. [6]
(b) The maximum payload of a TCP segment is 65,495. Why was such a strange number chosen? [5]

- (c) What is the importance of SYN and ACK fields in TCP frame format? [5]
8. (a) Write short notes on public key algorithms.
- (b) Write short notes MMIME and SMTP [8+8]
