Code No: RR320503 **Set No. 1**

III B.Tech II Semester Supplimentary Examinations, Apr/May 2008
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

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1. (a) List two advantages and two disadvantages of having international standards for network, Protocols?
   (b) Write short notes on interfaces and services of ISO layers. [8+8]
2. (a) The following data fragment occurs in the middle of a data stream for which the character-stuffing algorithm described in the text is used: DLE, STX, A, DLE, B, DLE, ETX. What is the output after stuffing?
   (b) When bit stuffing is used, is it possible for the loss, insertion, or modification of a single bit to cause an error not detected by the checksum? If not, why not? If so, how? Does the checksum length play a role here?
   (c) Data link protocols almost always put the CRC in a trailer, rather than in a header. Why? [6+6+4]
3. (a) Explain in detail the operation of slotted ALOHA.
   (b) Ten thousand airline reservation stations are competing for the sue of a single slotted ALOHA channel. The average station makes 18 requests/hour. A slot is 125 μsec. What is the approximate total channel load? [8+8]
4. (a) Briefly discuss about congestion control in VC subnets.
   (b) A computer on a 6-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps? [8+8]
5. (a) Imagine a generalized n-army problem, in which the agreement of any two of the armies is sufficient for victory. Does a protocol exist that allows blue to win?
   (b) Suppose that the clock-driven scheme for generating initial sequence numbers is used with a 15-bit wide clock counter. The clock ticks once every 100msec, and the maximum packet lifetime is 60sec. How often need resynchronization take place
      i. in the worst case?
      ii. when the data consumes 240 sequence numbers/min?
   (c) Why does the maximum packet lifetime, T, have to be large enough to ensure that not only the packet, but also its acknowledgements, have vanished? [6+6+4]

6. (a) Briefly discuss about Concatenated Virtual Circuits.
   (b) Briefly discuss about connection less Internetworking. [8+8]
7. (a) What is Nagle's algorithm? Explain the problem of silly window syndrome: suggest a solution to this problem.
   (b) What are blocking calls, primitives and non-blocking primitives? [8+8]
8. (a) What is MOSPF? Discuss briefly about Multicast Backbone.
   (b) Draw and Explain the hardware architecture of a Simple set-top box. [8+8]

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Answer any FIVE Questions
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1. (a) Briefly explain about the TCP/IP reference model.
   (b) Compare and contrast OSI and TCP/IP models. [8+8]
2. (a) Imagine a sliding window protocol using so many bits for sequence numbers that wrap around never occurs. What relations must hold among the four window edges and the window size?
   (b) PPP is based closely on HDLC, which uses bit stuffing to prevent accidental flag bytes within the payload from causing confusion. Give at least one reason why PPP uses character stuffing instead. [8+8]
3. (a) What is time domain reflectometry? Write about 802.3 cabling.
   (b) Draw and Explain 802.3 frame format. [8+8]
4. (a) A computer on a 6-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps?
   (b) Briefly discuss about congestion control in VC subnets. [8+8]
5. (a) Briefly discuss about Transport Layer quality of service parameters.
   (b) Briefly explain the concept of Addressing in TL. [8+8]
6. (a) Draw and explain in detail Internet Protocol Header (IPV4).
   (b) Briefly discuss about IP address classes and special IP addresses. [8+8]
7. (a) Draw and explain the structure of the ATM Adaptation layer.
   (b) Draw and explain the AAL1 cell format, headers and trailers. [8+8]
8. (a) Briefly explain Needham-Schroeder authentication protocol.
   (b) Explain the operation of Kerberos V_4. [8+8]

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Code No: RR320503 **Set No. 3**

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Answer any FIVE Questions
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1. (a) Explain in detail ISO-OSI reference model.
   (b) With a neat diagram, explain the functionality of layers, protocols and interfaces. [8+8]
2. (a) What is SLIP? What are the disadvantages of it?
   (b) With an example, explain the importance of sequence numbers for Acknowledgements. [8+8]
3. (a) A 4-Mbps token ring has a token-holding timer value of 10m sec. What is the longest frame that can be sent on this ring?
   (b) In a token ring the sender removes the frame. What modifications to the system would be needed to have the receiver remove the frame instead, and what would the consequences be? [8+8]
4. (a) A computer on a 6-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps?
   (b) Briefly discuss about congestion control in VC subnets. [8+8]
5. (a) What is forbidden region? Explain three-way handshake protocol used for establishing connection.
   (b) Explain in detail Four protocol scenarios for releasing a connection. [8+8]
6. (a) Draw and explain in detail Internet Protocol Header (IPV4).
   (b) Explain in detail Firewall operation. [8+8]
7. (a) Suppose that the TCP congestion window is set to 18K bytes and a timeout occurs. How bit will the window be if the next four transmission bursts are all successful? Assume that the maximum segment size is 1 KB.
   (b) If the TCP round-trip time, RTT, is currently 30 msec and the following acknowledgements come in after 26,32, and 24msec, respectively. What is the new RTT estimate? Use $\alpha = 0.9$.
   (c) Datagram fragmentation and reassembly are handled by IP and are invisible to TCP. Does this mean that TCP does not have to worry about data arriving in the wrong order? [6+6+4]

8. (a) What is "Quantization noise"? Briefly discuss about MIDI.
   (b) Explain any two compression techniques. [8+8]

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Answer any FIVE Questions
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1. (a) Write any four reasons for using layered protocols.
   (b) List two ways in which the OSI reference model and the TCP/IP reference model are the same and list in which they differ.
   (c) Which is the principle difference between CO communication and CL communication. [6+4+6]

2. (a) Imagine a sliding window protocol using so many bits for sequence numbers that wrap around never occurs. What relations must hold among the four window edges and the window size?
   (b) PPP is based closely on HDLC, which uses bit stuffing to prevent accidental flag bytes within the payload from causing confusion. Give at least one reason why PPP uses character stuffing instead. [8+8]

3. (a) Compare contrast pure ALOHA Vs slotted ALOHA.
   (b) Consider the delay of pure ALOHA Vs slotted ALOHA at low load. Which are is les? Explain your Answer. [8+8]

4. (a) Briefly discuss about congestion control in VC subnets.
   (b) Write short notes on:
      i. Choke packet
      ii. Load shedding
      iii. Jitter control. [8+8]

5. (a) Define the following terms:
      i. Option Negotiation
      ii. Transport quality
      iii. Transport service user
      iv. Transport service provider.
   (b) Explain in detail Four protocol scenarios for releasing a connection. [8+8]

6. (a) What is tunneling? Can tunneling be used in datagram subnets? If so, how?
   (b) What is three bears problem? Write short notes on CIDR. [8+8]

7. (a) What is Nagle's algorithm? Explain the problem of silly window syndrome: suggest a solution to this problem.
   (b) Briefly discuss about TCP timer management. [8+8]

8. (a) What is SMTP? Briefly discuss about Email gateways.
   (b) Write short notes on pretty good privacy. [8+8]

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