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

III B.Tech II Semester Regular Examinations, Apr/May 2007
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) 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) Mentioning the advantages and disadvantages, explain sliding window protocol using Go back n and using selective repeat.
   (b) Draw, and explain about HDLC protocol. [8+8]

3. (a) Explain in detail the operation of slotted ALOHA.
   (b) Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one is less? Explain your answer. [8+8]

4. (a) An ATM network uses a token bucket scheme for traffic shaping. A new token is put into the bucket every 5 μsec. What is the maximum sustainable net data rate (i.e., excluding header bits)?
   (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?
   (c) A data gram subnet allows routers to drop packets whenever they need to. The probability of a router discarding a packet is p. Consider the case of a source host connected to the source router, which is connected to the destination router, and then to the destination host. If either of the routers discards a packet, the source host eventually times out and tries again. If the host-router and router-router lines are counted as hops, what is the mean number of
      i. hops a packet makes per transmission?
      ii. transmissions a packet makes?
      iii. hops required per received packet? [4+6+6]

5. (a) Imagine that a two-way handshake rather than a three-way handshake were used to set up connections. In other words, the third message was not required. Are deadlocks now possible? Give an example or show that none exist.
   (b) Explain in detail Four protocol scenarios for releasing a connection. [8+8]

6. (a) Briefly discuss about the ways network can differ.
   (b) Briefly discuss about IP address classes and special IP addresses. [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 Cryptanalysis? Briefly discuss about substitution cipher, transposition ciphers and one-time pads.
   (b) Explain any one secrete key algorithm. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320503 **Set No. 2**

III B.Tech II Semester Regular Examinations, Apr/May 2007
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) Compare and contrast OSI and TCP/IP models.
   (b) Draw and explain in detail about ISO-OSI reference model. [8+8]

2. (a) What is pipelining? With an example, explain Go back-n sliding window protocol.
   (b) Frames of 1000 bits are sent over a 1-Mbps-satellite channel. Acknowledgements are always piggybacked onto data frames. The headers are very short. Three-bit sequence numbers are used. What is the maximum achievable channel utilization for.
      i. Stop-and-wait
      ii. Go-back n.
      iii. Selective repeat. [8+8]

3. (a) Two CSMA/CD stations are each trying to transmit long (multiframe) files. After each frame is sent, they contend for the channel using the binary exponential backoff algorithm. What is the probability that the contention ends on round k, and what is the mean number of rounds per contention period?
   (b) Consider building a CSMA/CD network running at 1 Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size? [8+8]

4. In the link state Routing Algorithm explain how to
   (a) Learn about neighbours
   (b) Measure the line cost.
   (c) Build Link state Packets
   (d) Distributing Link state packets, and
   (e) Compute the New routes. [16]

5. (a) Briefly explain the concepts of Flow Control and Buffering.
   (b) 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? [8+8]

6. (a) Briefly discuss about Concatenated Virtual Circuits.
   (b) Briefly discuss about connection less Internetworking. [8+8]

7. (a) Can AAL 1 handle messages shorter than 40 bytes using the scheme with the Pointer field? Explain your answer.
   (b) Suppose that 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 7,30,000 times. How long does it take to receive a TPDU?
   (c) What is the payload size of the maximum length message that fits in a single AAL 3/4 cell? [6+6+4]

8. (a) Explain the built-in HTTP request methods.
   (b) How do you make an image clickble in HTML? Give an example. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

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

III B.Tech II Semester Regular Examinations, Apr/May 2007
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) Explain in detail ISO-OSI reference model.
   (b) Write short notes on interface, service and protocol. [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 the Binary exponential back off algorithm.
   (b) Write about 802.3 performance. [8+8]

4. What is Routing Algorithm? What are the classification of it? What is optimality principle? With an example, explain shortest path Routing Algorithm. [16]

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) What is tunneling? When it is used? Is it used in wireless LAN's?
   (b) Briefly discuss about connection less Internetworking. [8+8]

7. (a) Draw and explain in detail the TCP Header.

(b) Give the format of UDP segment and TCP segment? Explain when UDP is preferred to TCP? [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]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: RR320503 **Set No. 4**

III B.Tech II Semester Regular Examinations, Apr/May 2007
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) Explain in detail ISO-OSI reference model.
   (b) Write short notes on interface, service and protocol. [8+8]

2. (a) 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.
   (b) Frames of 1000 bits are sent over a 1-Mbps satellite channel. Acknowledgements are always piggybacked onto data frames. The headers are very short. Three-bit sequence numbers are used. What is the maximum achievable channel utilization for
      i. Stop-and-wait
      ii. Go-back n.
      iii. Selective repeat. [8+8]

3. (a) Two CSMA/CD stations are each trying to transmit long (multiframe) files. After each frame is sent, they contend for the channel using the binary exponential backoff algorithm. What is the probability that the contention ends on round k, and what is the mean number of rounds per contention period?
   (b) Consider building a CSMA/CD network running at 1 Gbps over a 1-km cable with no repeaters. The signal speed in the cable is 200,000 km/sec. What is the minimum frame size? [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 Internet work Routing.

(b) Briefly discuss about connection less Internetworking. [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) 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]

8. (a) What is Cryptanalysis? Briefly discuss about substitution cipher, transposition ciphers and one-time pads.

(b) Explain any one secrete key algorithm. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆