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Third Semester MCA Degree Examination, December 2012

Computer Networks

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1
 - a. Explain the functions of different layers of OSI model with a suitable diagram. (10 Marks)
 - b. Calculate the latency (from first bit sent to last bit received) for the following:
 - i) A 10 Mbps Ethernet with a single store and forward switch in the path and a packet size of 5000 bits. Assume that each link introduces a propagation delay of $10 \mu\text{s}$ and that the switch begins retransmitting immediately after it has finished receiving the packet. (10 Marks)
 - ii) Same as (i) but with three switches. (10 Marks)
- 2
 - a. What is framing? Why it is necessary? Explain clock-based framing (SONET) with frame format. (10 Marks)
 - b. Suppose we want to transmit the message 1011001001001011 and protect it from errors using CRC8 polynomial $x^8 + x^2 + x1 + 1$.
 - i) Use polynomial long division to determine the message that should be transmitted. (10 Marks)
 - ii) Suppose the left most bit is inverted due to the noise on transmission link for the above message. What is the result of the receiver's CRC calculation? How does the receiver know that an error has occurred? (10 Marks)
- 3
 - a. Explain the concept of stop and wait protocol with necessary diagrams for different scenario. (08 Marks)
 - b. In what situation stop and wait protocol works efficiently? (03 Marks)
 - c. What is multiplexing? Describe in detail FDM and statistical multiplexing. (09 Marks)
- 4
 - a. Describe bridge forwarding and bridge learning with respect to transparent bridges with flowcharts. (10 Marks)
 - b. Briefly explain spanning tree algorithm. (10 Marks)
- 5
 - a. Describe Bellman-Ford algorithm. What are the disadvantages of Bellman-Ford algorithm? (10 Marks)
 - b. Explain IPV4 header with a suitable diagram. (10 Marks)
- 6
 - a. Explain briefly CIDR. (05 Marks)
 - b. A block of address is granted to a small organization. We know that one of the addresses is 205.16.37.39/28. Find first address, last address and number of addresses in that block. (05 Marks)
 - c. Explain three-way and four-way hand shakes for connection establishment and termination respectively for TCP with diagrams. (10 Marks)
- 7
 - a. What are key characteristics of UDP? (05 Marks)
 - b. Explain UDP datagram format. (05 Marks)
 - c. Write a brief note on Domain Name System (DNS). (10 Marks)
- 8

Write short notes on:

a. Blue tooth	b. File transfer and FTP
c. Session Initiation Protocol (SIP)	d. Network Address Translation

(20 Marks)