Second Semester M.Tech Degree Examination, June – July 2009
Computer Networks

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

1. a. Consider a point – to –point link 50km in length. At what bandwidth would propagation delay (at a speed of 2×10^8 m/s) equal transmit delay for 100 byte packets? What about 512 byte packets? **(04 Marks)**
   b. With reference to network architecture briefly explain the following terms :
      i) Layering   ii) Encapsulation. **(06 Marks)**
   c. Discuss the requirements of a computer network. **(10 Marks)**

2. a. Briefly explain the following terms with reference to NRZ encoding:
      i) Baseline wander   ii) Clock recovery. **(04 Marks)**
   b. Suppose we want to transmit the message 10011010 and protect it from errors using the CRC – 3 polynomial $x^3 + x^2 + 1$. Using the polynomial long division determine the message that should be transmitted. **(06 Marks)**
   c. Discuss the Ethernet 802.3 LAN technology. **(10 Marks)**

3. a. Explain the ATM cell format with a diagram. **(04 Marks)**
   b. Briefly explain the features of a switch fabric. **(06 Marks)**
   c. Discuss how bridges use spanning algorithm to handle loops. Give an example. **(10 Marks)**

4. a. What is VPN tunnel? Explain its significance with an example. **(04 Marks)**
   b. A block of addresses is granted to a small corporation. If one of the address is known as 205.16.37.39/28. Find – i) First address in the block   ii) Last address in the block
      iii) Total number of addresses in the block. **(06 Marks)**
   c. Discuss the link state routing. With a suitable example explain the steps for building routing table at any one router. **(10 Marks)**

5. a. What is IPv6? What are its main features? **(04 Marks)**
   b. What is the range of addresses reserved for private networks? Explain the operation of NAT with an example. **(06 Marks)**
   c. What are the goals or challenges of interdomain routing? Explain how a network running BGP works and also explain the prevention of looping paths with a suitable example. **(10 Marks)**

6. a. Illustrate the phenomenon of silly window syndrome in TCP. **(04 Marks)**
   b. What is RPC? Explain in detail the steps involved in making a RPC. **(06 Marks)**
   c. Explain the 3 – way handshake mechanism of TCP connection establishment. With a timeline, illustrate how it can work properly even in the presence of delayed duplicates. **(10 Marks)**

7. a. Briefly explain the taxonomy of resource allocation. **(04 Marks)**
   b. Mention the different congestion avoidance mechanisms. Explain how source based congestion avoidance attempts to avoid congestion purely from the end nodes. **(06 Marks)**
   c. Explain in detail FIFO queuing algorithm. Distinguish between FIFO and priority queuing. List the drawbacks of FIFO. **(10 Marks)**

8. Write short notes on:
   a. e-mail   c. MPLS
   b. SNMP   d. Overlay networks. **(20 Marks)**

* * * * *