1. Please briefly describe how ATM networks classify and achieve different classes of services.
2. What is a virtual circuit network and what is a datagram network? Please draw diagrams to explain them.
3. What is longest prefix matching? Please also use an example to explain it.
4. Please draw diagrams to show input port functions and output port functions for a router and explain their functions briefly.
5. What is a subnet? What is CIDR (Classless InterDomain Routing)? Explain the meaning of 140.1.1.0/23 in IPv4 addressing. And what is DHCP?
6. Please explain what is NAT traversal problem? Please draw two possible solutions to resolve the NAT traversal problem.
7. Please list four major changes from IPv4 to IPv6 and explain the considering points of making such changes.
8. Please write pseudo codes for link state algorithm and Bellman-Ford algorithm, respectively.
9. Please explain the advantages and disadvantages of center-based tree reverse path forwarding in multicasting and write pseudo codes for them, respectively. Based on your pseudo codes above, please write pseudo codes for Protocol Independence Multicast (PIM).
10. What is TDMA? What is FDMA? And what is random access?
11. Please explain the operation of DOCSIS (data over cable service interface spec).
12. In the class we describe how to Google a web page in a day in the life of a web request. Please explain it as detailed as you remember.
13. What is CSMA/CD? What is CSMA/CA? Please use graph to demonstrate the advantage of using CD and CA, respectively. Please also describe how the backoff algorithm in CSMA/CD works?
14. What is hidden terminal problem and what is exposed terminal problem? Please draw pictures to explain them briefly.
15. Please explain how to handle mobility on mobile IP and cellular networks, respectively. Please use graphs and list the sequence of messages.
16. 111-11-1-1-1 and 1 -1111-111 are two orthogonal codes or chipping sequences for CDMA. Please use those two codes and draw a graph to show we can transmit two data bits (streams) within the same frequency range and retrieve two data bits (streams) correctly at receivers.
17. Please explain the trade off in deciding the playout delays for playing streaming videos.
18. What is DASH (Dynamic, Adaptive Streaming over HTTP) and what are content distribution networks? Please describe them briefly.
19. Please describe two ways to recover from packet losses in VoIP. Please also describe how can we have adaptive playout delay adjustment for VoIP?
20. What are RTP, RTCP, and SIP, respectively?
21. What is traffic shaping? How to implement it?