Question Bank

Unit I

1. Identify the five components of a data communications system.
2. What are the advantages of distributed processing?
3. What are the three criteria necessary for an effective and efficient network?
4. What are the advantages of a multipoint connection over a point – to point connection?
5. What are the two types of line configuration?
6. Categorize the four basic topologies in terms of line configuration.
7. What is the difference between half-duplex and full-duplex transmission modes?
8. Name the four basic network topologies, and give an advantage for each type.
9. For n devices in a network, what is the number of cable links required for a mesh, ring, bus, and star topology?
10. What are some of the factors that determine whether a communications system is a LAN, MAN, or WAN?
11. What is an internet? What is the Internet?
12. Why are protocols needed?
13. Why are standards needed?
14. List the layers of the Internet model.
15. Which layers in the Internet model are the network support layers?
16. Which layer in the Internet model is the user support layer?
17. What is a peer-to-peer process?
18. What are the concerns of the physical layer in the Internet model?
19. What are the responsibilities of the data link layer in the Internet model?
20. What are the responsibilities of the network layer in the Internet model?
21. What are the responsibilities of the transport layer in the Internet model?
22. What is the difference between a port address, a logical address, and a physical address?
23. Name some services provided by the application layer in the Internet model.
24. How do the layers of the Internet model correlate to the layers of the OSI model?
25. What does the term modem stand for?
26. What is the function of a modulator? What is the function of a demodulator?
27. Explain the asymmetry of 56K modems.
28. Why are modems needed for telephone communications?

Unit II

1. How does a single-bit error differ from a burst error?
2. Discuss the concept of redundancy in error detection.
3. What are three types of redundancy checks used in data communications?
4. What is the difference between even parity and odd parity?
5. Discuss the parity check and the types of errors it can and cannot detect.
6. Discuss the two-dimensional parity check and the types of errors it can and cannot detect.
7. What does the CRC generator append to the data unit?
8. What is the relationship between the size of the CRC remainder and the divisor?
9. How does the CRC checker know that the received data unit is undamaged?

10. What are the conditions for the polynomial used by the CRC generator?
11. How is CRC superior to the two-dimensional parity check?
12. What is the error detection method used by upper-layer protocols?
13. List the steps involved in creating a checksum.
14. How does the checksum checker know that the received data unit is undamaged?
15. What kind of error is undetectable by the checksum?
16. What is the formula to calculate the number of redundancy bits required to correct a bit error in a given number of data bits?
17. What is the purpose of the Hamming code?
18. How can we use the Hamming code to correct a burst error?
19. Why is flow control needed?
20. What are three popular ARQ mechanisms?
21. How does ARQ correct an error?
22. Stop-and-Wait ARQ has two control variables S and R. What are their functions?
23. How does Go-Back-N ARQ differ from Selective Repeat ARQ?
24. What is the purpose of the timer at the sender site in systems using ARQ?
25. Discuss the size of the Go-Back-N ARQ sliding window at both the sender site and the receiver site.
26. Discuss the size of the Selective Repeat ARQ sliding window at both the sender site and the receiver site.
27. How is the bandwidth-delay product related to the system efficiency?
28. In HDLC, what is bit stuffing and why is it needed?
29. Name the types of HDLC frames, and give a brief description of each.
30. Name and discuss briefly the bits in the HDLC control field.
31. What is piggybacking?
32. How is the preamble field different from the SFD field?
33. What is the purpose of an NIC?
34. What is the purpose of a transceiver?
35. What is the difference between a multicast address and a broadcast address?
36. What are the advantages of dividing an Ethernet LAN with a bridge?
37. What is the relationship between a switch and bridge?
38. Compare the data rates for traditional Ethernet, Fast Ethernet, and Gigabit Ethernet.
39. What are the common traditional Ethernet implementations?
40. What are the common Fast Ethernet implementations?
41. What are the common Gigabit Ethernet implementations?
42. What is the difference between a BSS and ESS?
43. Discuss the three types of mobility in a wireless LAN.
44. What is a transparent bridge?
45. How does a repeater extend the length of a LAN?
46. How is a hub related to a repeater?
47. What is the difference between a root bridge and a designated bridge?
48. What is the difference between a forwarding port and a blocking port?
49. What is the difference between a bus backbone and a star backbone?

Unit III

1. What is Internet protocol?
   The Internet protocol is the key tool used to build scalable, heterogeneous internetworks.
2. What is the fundamental difference between circuit switching and packet switching?
   In circuit switching, a physical link is dedicated between a source and a destination. The data is send as a stream of bits.
   In packet switching, no physical link exist and data is transmitted as a variable length called packets.
3. What are the different approaches to packet switching?
   a. Virtual circuit approach
   b. Datagram approach
   c. Source routing approach
4. A message is broken up into three pieces. Discuss the transmission of the packets using the datagram approach to packet switching.
   The three pieces of information contains source and destination address may take a different path to reach its destination. The switches or routers having a routing table decide on the route based on the source and destination address.
5. Why does the Internet use a connectionless network service?
6. What are the various notations for specifying IP address?
7. Why is the largest octet in an Internet address 255?
8. Name the five current IP address classes. Which are used for unicast communication?
9. Which class of IP address is used for multicast communication?
10. What is the network address?
11. What is the purpose of subnetting?
12. What is a default mask?
13. How does next-hop routing decrease the number of table entries in a router?
14. How does network-specific routing decrease the number of table entries in a router?
15. How does host-specific routing decrease the number of table entries in a router?
16. How does default routing decrease the number of table entries in a router?
17. What is the difference between unicast routing and multicast routing?
18. Why would an internet need an Autonomous System?
19. What is the difference between an interior routing protocol and an exterior routing protocol? Name an example of each.
20. What kind of information is in a routing table?
21. How the metrics are assigned in RIP and OSPF?
22. Name the four types of OSPF connections.
23. What is the difference between a transient link and a stub link?
24. What is the purpose of a Link State Advertisement?
25. What is the role of the Dijkstra algorithm in unicast routing?

Unit IV

1. What is the difference between a process-to-process delivery and a host-to-host delivery?
2. How is a well-known port different from an ephemeral port?
3. What do you meant by IANA ranges?
4. What is a socket address?
5. State some of the functions performed by the server in socket programming.
6. State some of the functions performed by the client in socket programming.
7. What do you meant by multiplexing and demultiplexing in transport layer?
8. When is a three-way handshake used?
9. Why would an application use UDP instead of TCP?
10. What is a UDP packet called? What is a TCP packet called?
11. State some of the port numbers that are commonly used in both UDP and TCP.
12. What is the purpose of the sequence number in a TCP packet?
13. What do you meant by state transition diagram and its use?
14. What is the purpose of flow control?
15. What is the silly window syndrome?
16. What is Nagle's algorithm?
17. What methods can prevent a silly window syndrome created at the receiver?
18. What is the purpose of error control?
19. How are congestion control and quality of service related?
20. What is a traffic descriptor?
21. What is the relationship between the average data rate and the peak data rate?
22. What is the definition of bursty data?
23. How will you measure the performance of a network? How delay is related to the performance?
24. What is the difference between open-loop congestion control and closed-loop congestion control?
25. Name the policies that can prevent congestion.
26. Name the mechanisms that can alleviate congestion.
27. What determines the sender window size in TCP?
28. How does Frame Relay control congestion?
29. What are the strategies we have to avoid congestion?
30. What attributes can be used to describe the characteristics of data flow?
31. What are four general techniques to improve quality of service?
32. What is traffic shaping? Name two methods to shape traffic.
33. What is the major difference between Integrated Services and Differentiated Services?
34. How is Resource Reservation Protocol related to Integrated Services?
35. Name two classes of service defined for Integrated Services.
36. What are the various messages of RSVP?
37. State some of the problems with Integrated Services.

Unit V

1. What is an advantage of a hierarchical name space over a flat name space for a system the size of the Internet?
2. What is the difference between a primary server and a secondary server?
3. What are the three domains of the domain name space?
4. What is the purpose of the inverse domain?
5. How does recursive resolution differ from iterative resolution?
6. What is a FQDN?
7. What is a PQDN?
8. What is a Zone?
9. How does caching increase the efficiency of name resolution?
10. What are the two main categories of DNS messages?
11. Why was there a need for DDNS?
12. What is the name of the protocol used for electronic mail over the Internet?
13. What are the two main parts of an email?
14. Describe the addressing system used by SMTP.
15. What is a user agent?
16. What are the two types of user agents?
17. What is MIME?
18. What are the three mail transfer phases?
19. Name two mail access protocols.
20. What is the purpose of FTP?
21. Describe the functions of the two FTP connections.
22. What kinds of file types can FTP transfer?
23. What are the three FTP transmission modes?
24. How does storing a file differ from retrieving a file?
25. What is anonymous FTP?
26. How is HTTP related to WWW?
27. How is HTTP similar to SMTP?
28. How is HTTP similar to FTP?
29. What is a URL and what are its components?
30. What is a homepage?
31. Name the common three components of a browser.
32. What are the three types of web documents?
33. What does HTML stand for and what is its function?
34. What is the difference between an active document and a dynamic document?
35. What does CGI stand for and what is its function?
36. Describe the relationship between Java and an active document.
37. What is the relationship between plaintext and ciphertext?
38. What are the two categories of cryptography methods? What is the main difference between the categories?
39. What is the concept behind substitutional cryptography?
40. Why is polyalphabetic substitution superior to monoalphabetic substitution?
41. What is the concept behind transpositional cryptography?
42. What is a block cipher?
43. How is triple DES different from the original DES?
44. What keys are needed for public-key cryptography?
45. What is a popular public-key encryption algorithm