**networking and Security**

**Final exam**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## INSTRUCTIONS

1. Use the word processor on the computer to fill in this assessment.
2. Start by inserting your name in the space above.
3. After reviewing these questions, save this file with your answers to your computer using the required file name format: ““<YourStudentID> Final\_Exam.doc” where <YourStudentID> is your Student ID and there is a blank between it and the Final\_Exam.
4. On the LMS, click the **Browse** button next to the **File to submit:** box.
5. Locate the file for attachment.
6. Once you have attached the file, click **Upload File**.
7. After the file has been uploaded, confirm the uploaded file, select the file, and click the **Ready for Grading** button.

## ASSESSMENT QUESTIONS

**For the questions below, choose the best answer from the choices presented.**

**Mark as True or False by deleting the wrong alternative for the following. Worth 3 points each.**

1. True or False Layers four and five of the Internet protocol stack are implemented in the end systems but not in the routers in the network core.
2. True or False With ADSL, each subscriber gets more downstream bandwidth than upstream bandwidth.
3. True or False Twisted-pair cooper wire is no longer present in computer networks.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. Two packets A and B are sent in that order through a connection-oriented communication network. They could arrive at the destination:
2. in any order, after having traversed the same route.
3. only in the order A-B, after possibly having traversed different routes.
4. in any order, after possibly having traversed different routes.
5. only in the order A-B, after having traversed the same route.
6. Two packets A and B are sent in that order through a connectionless communication network. They will arrive at the destination:
7. in any order, after possibly having traversed different routes.
8. in the order A-B, after having traversed the same route.
9. in any order, after having traversed the same route.
10. in the order A-B, after possibly having traversed different routes.
11. The Internet received its name in the 1980s because:
12. it was an interim (temporary) design of what it later became, but the name stuck.
13. it was meant to be a network internal to the United States Department of Defense.
14. it consisted of many interconnected networks.
15. it achieved international scope with the addition of the City University of London.

**Mark as True or False by deleting the wrong alternative for the following. Worth 3 points each.**

1. True or False DNS lookups often involve a combination of recursive and iterative queries.
2. True or False The Date: header in the HTTP response message indicates when the object in the response was last modified.
3. True or False Skype relay nodes are typically peers under the control of Skype users.
4. True or False The process that sends messages into, and receives messages from, the network through a software interface is called a socket.
5. True or False In a P2P File Distribution architecture, the server must sequentially send (upload) file copies.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. SMTP is used to:
2. to transfer messages from one mail server to another.
3. to transfer messages from mail server to a user agent.
4. to define the format of message headers.
5. all of the above.
6. Suppose a DNS resource record has Type=MX. Then:
7. Value is the hostname of the DNS server that is authoritative for Name.
8. Value is the IP address of the mail server that has the alias hostname Name.
9. Value is the hostname of the mail server that has the alias hostname Name.
10. none of the above.
11. Local DNS name servers:
12. cache resource records, but discard them after a period of time that is on the order of a few days.
13. cache resource records and never discard them.
14. obtain resource records from Web caches.
15. never cache resource records.

**Mark as True or False by deleting the wrong alternative for the following. Worth 3 points each.**

1. True or False Consider an HTTP Web server using persistent connections. Suppose the server spawns a   
   separate process for each client that connects to the server. Then each of these spawned processes will have different server port numbers.
2. True or False The size of the TCP RcvWindow never changes throughout the duration of the connection.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. When a TCP segment arrives to a host, the socket to which the segment is directed depends on
2. the source IP address of the datagram that encapsulated the segment.
3. the destination port number.
4. the source port number.
5. all of the above.
6. UDP has which of the following characteristics:
7. regulated send rate.
8. connection state at the server.
9. three-way hand shake for connection establishment.
10. none of the above.
11. When a UDP segment arrives to a host, in order to direct the segment to the appropriate socket, the OS uses:
12. the source port number.
13. the source IP address.
14. the destination port number.
15. all of the above.
16. Suppose a client sends an HTTP request message with the If-modified-since: header. Suppose the object in a server has not changed since the last time a client retrieved the object. Then the server will send a response message with the status code:
17. 404 Not Found.
18. 200 OK.
19. 304 Not Modified.
20. none of the above.
21. Streams are not needed in which of the following programs:
22. TCPserver.
23. UDPserver.
24. TCPclient.
25. UDPclient.
26. Consider the minimum time for P2P file distribution, as discussed in Section 2.6. Suppose the upload rate of the server is10 Mbps, the upload rates of all peers is 1 Mbps, and the download rates of all peers is 10 Mbps. Further suppose that there are 100 peers and the file is 100 million bits. The minimum distribution time is
27. approximately 100 seconds.
28. approximately 10 seconds.
29. approximately 1 second.
30. approximately 1000 seconds.
31. For BitTorrent, which of the following is true:
32. Although a peer may have 50 concurrent TCP connections with other peers, at any given instant of time it sends data to less than 10 other peers.
33. At a given instant of time, a peer A may upload to a peer B, even if peer B is not sending anything to A.
34. Among the chunks that a peer does not have, the peer will request chunks that appear to be relatively rare in the torrent.
35. All of the above.
36. Consider the latency model for dynamic congestion windows. Which of the following components contribute to latency?
37. the sum of all the stalled times.
38. round trip time, RTT.
39. the transmission time of the object, O/R.
40. all of the above.
41. TCP applies fast retransmit to a segment when:
42. it estimates unusually large RTTs.
43. it receives three ACKs for an earlier segment.
44. the segment's timer expires.
45. none of the above.
46. Nmap is often used to:
47. do port scans over a range of ports at a target host.
48. measure throughput between hosts.
49. measure round-trip times between hosts.
50. decipher encrypted traffic.
51. With SYN cookies, when a server receives a SYN segment, it returns a SYNACK with:
52. an initial sequence number that is a hash of the IP addresses and port numbers in the SYN segment (as well as of other things).
53. initial sequence number 1.
54. a randomly chosen initial sequence number.
55. none of the above.

**Mark as True or False by deleting the wrong alternative for the following. Worth 3 points each.**

1. True or False Before sending a packet into a datagram network, the source must determine all of the links that packet will traverse between source and destination.
2. True or False The primary role of a router is to forward datagrams from input links to output links.
3. True or False Forwarding involves transferring a packet from the router’s input link to the appropriate output link.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. A forwarding table is:
2. Used to find the proper interface to which the input interface should forward a packet.
3. Configured using a centralized routing algorithm.
4. Configured through routing protocol messages received by router.
5. A and C.
6. B and C.
7. How are routing paths calculated?
8. The full route is mapped out in the datagram’s header.
9. Paths are calculated by routing algorithms.
10. Datagrams always flow on the same path and don’t need to be calculated.
11. The path is calculated based on available network bandwidth.

**Match the following network service to the correct definition. Worth 3 points each.**

1. Guaranteed Delivery: \_B\_
2. Guaranteed Delivery with Bounded Delay: \_C\_
3. Guaranteed Maximum Jitter: \_A\_
4. Guarantees the amount of time between the transmission of two successive packets at the sender is equal to the amount of time between their receipt at the destination.
5. Guarantees a packet will arrive at its destination.
6. Guarantees delivery within a specified host-to-host delay bound.

**Mark as True or False by deleting the wrong alternative for the following. Worth 3 points each.**

1. True or False All link layer protocols that support IP have the same frame structure (i.e., length of frame,   
   number and length of header fields).
2. True or False CRC error detection, as used in Ethernet, is always able to detect whether there is an error in a frame.
3. True or False The even parity bit scheme can correct single bit errors.
4. True or False With CDMA, each sender uses the same code, cm, m=1,...,M.
5. True or False Each LAN adapter has a unique LAN address.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. A channel partitioning protocol has which of the following characteristics forwarding table is:
2. it does not generate collisions.
3. all transmitting nodes get the same amount of bandwidth.
4. there is no master node.
5. all of the above.
6. In slotted ALOHA with N active nodes, the probability that no node transmits in a given slot is
7. (1-p)N
8. (1-p)N
9. pN
10. 1-p
11. Macintosh HD:Users:John:Dropbox:SDP09 Networking and Security:Reference:Self-Assessment Quizzes:Ch 5:Ch 5 MC_files:index(2)_files:pixel.gifuestion 3.An ARP query packet is encapsulated in
12. an IP datagram.
13. a link-layer frame addressed to a specific adapter.
14. a link-layer broadcast frame.
15. none of the above.  
     Macintosh HD:Users:John:Dropbox:SDP09 Networking and Security:Reference:Self-Assessment Quizzes:Ch 5:Ch 5 MC_files:index(2)_files:pixel.gif Macintosh HD:Users:John:Dropbox:SDP09 Networking and Security:Reference:Self-Assessment Quizzes:Ch 5:Ch 5 MC_files:index(2)_files:ps_bkgd_upper_right.gif
16. Macintosh HD:Users:John:Dropbox:SDP09 Networking and Security:Reference:Self-Assessment Quizzes:Ch 5:Ch 5 MC_files:index(2)_files:pixel.gifEthernet provides which of the following services to the network layer
17. error detection.
18. flow control.
19. reliable data transfer.
20. all of the above.
21. Macintosh HD:Users:John:Dropbox:SDP09 Networking and Security:Reference:Self-Assessment Quizzes:Ch 5:Ch 5 MC_files:index(2)_files:pixel.gifFor Ethernet, if an adapter determines that a frame it has just received is addressed to a different adapter
22. it discards the frame without sending an error message to the network layer.
23. it discards the frame and sends an error message to the network layer.
24. it sends a NACK (not acknowledged frame) to the sending host.
25. it delivers the frame to the network layer, and lets the network layer decide what to do.

**Mark as True or False by deleting the wrong alternative for the following. Worth 3 points each.**

1. True or False A typical "infrastructure network" wireless network includes base stations.
2. True or False In CDMA, the chipping rate is typically the same as the original data rate.
3. True or False The 11 channels in the 802.11 are non-overlapping.
4. True or False If you enter an Internet café and more than one AP is present, then the packets your host sends are forwarded into the Internet by both APs.
5. True or False During the 802.11 association handshake protocol, the wireless host gets assigned an IP address.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. In CDMA, let Ym be the received value in the mth mini-slot for some slot i. Let cm, m=1,...,M, be the sender's M code values. To determine the bit value the sender sent, the receiver:
2. multiples Ym with the sum of the M code values.
3. multiplies each Ym with the corresponding cm, sums the resulting values and divides by M.
4. simply declares Ym as the sent value.
5. none of the above.
6. A beacon frame sent by an AP includes
7. the AP's SSID.
8. the AP's MAC address.
9. both the AP's MAC address and SSID.
10. none of the above.
11. The 802.11 protocol does not implement collision detection because (Click all that apply)
12. collision detection was found to be useless in wired Ethernet.
13. the adapter would still not be able to detect all collisions due to hidden terminals.
14. it is costly to build wireless hardware that detects collisions.
15. all of the above.
16. Packets sent by two stations in 802.11 can collide because
17. at a given time, the random backoff values of the two stations are the same.
18. the packets are sent to different APs but on the same channel.
19. the two stations could be hidden from each other.
20. all of the above.
21. An 802.11 frame includes:
22. an acknowledgement field.
23. a sequence number field.
24. four address fields.
25. all of the above.

**Mark as True or False by deleting the wrong alternative for the following. Worth 4 points each.**

1. True or False In IP spoofing, the attacker interchanges the source and destination addresses in the sender's IP datagram.
2. True or False Nonce's are often used to combat the playback attack.
3. True or False Two parties often use public-key encryption to agree on a shared one-time symmetric session key.
4. True or False For public-key certification, PGP uses certification authorities.
5. True or False The AH protocol provides secrecy at the network layer.

**For the questions below, choose the best answer from the choices presented. Worth 3 points each.**

1. Which of the following statements best describes the purpose of the SNMP protocol?
2. The SNMP protocol specifies the actions a network manager should take in response to a specific set of network fault conditions.
3. The SNMP protocol is a tool for gathering data about network conditions and executing remote actions at remote managed devices.
4. The SNMP protocol is used by the network manager to provision resources, such as bandwidth, server capacity and other computational/communication resources needed to meet the mission-specific needs of an enterprise.
5. Suppose a network manager wanted to query the value of the number of TCP segments received by a host running the Microsoft Windows 2000 operating system in a US-based company. What would be the prefix (leading digits) of the MIB variable that should be queried?
6. 1.2.840.11356
7. 1.2.840
8. 1.3.6.1.2.1.1
9. What is the maximum number of received UDP datagrams that can be counted (without overflow) in the MIB-2 UDP module?
10. 2\*\*32 - 1
11. 2\*\*64 -1
12. 2\*\*16 - 1
13. 2\*\*31 - 1
14. What is the purpose of a presentation service?
15. To allow a client to inform a server that it (the client) is present and ready to receive data.
16. To encode, transmit, and translate data from one machine-specific format to another.
17. To display data in a format specified by a user.
18. None of the above.
19. Filtering in a firewall can be based on:
20. source and destination IP addresses
21. TCP ACK bits
22. source and destination port numbers
23. all of the above