Midterm 1: CST8182 Networking Fundamentals

Fall 2010

Time: 60 minutes; Total Marks available: 45 marks + 5 bonus marks
(Allocation of marks is shown beside each question)

Master Version

STOP!

Mark your test version in the field titled "Grade or Educ" on the scantron form.
(A = 1, B = 2, C = 3, D = 4, E = 5, F = 6)
Do it NOW!

Instructions:

1. BEFORE answering any questions, please check that your copy of the test has all pages (as indicated in the footer at the bottom of each page). Please read all questions carefully, then answer question 1 first!

2. Be sure to **mark your name and version of this midterm** on the scantron answer sheet.

3. All answers should be circled on this test paper **and** then marked on the scantron answer sheet.

4. If you do not find an answer which is clearly the correct choice, choose the *best* answer.

5. If you are uncertain what a question is asking, make reasonable assumptions, write those assumptions down on this test paper, and continue answering the question.

1. What is your:

NAME? _____ Student Id? _____

(Continued on next page)

1. [0 marks] What version of the test are you writing? The version letter is located on the cover sheet.
   (a) A
   (b) B
   (c) C
   (d) D
   (e) E

2. [1 mark] What three layers of the OSI model make up the Application layer for the TCP/IP model?
   (a) network, data link, physical
   (b) data link, network, transport
   (c) network, transport, application
   (d) transport, session, presentation
   (e) presentation, session, application **Correct**

3. [1 mark] What protocol is used to transfer web pages from server to client?
   (a) HTML
   (b) SMTP
   (c) HTTP **correct**
   (d) Telnet
   (e) TFTP

4. [1 mark] What application protocol is used to *send* email?
   (a) POP
   (b) UDP
   (c) TCP
   (d) SMTP **correct**
   (e) HTTP

5. [1 mark] From your lab work, you've seen that a simple "ping" command can trigger many network exchanges. Which one of the following protocols is **not** triggered (assume the computer has been freshly booted with no previous network exchanges) by a ping command?
   (a) DHCP **correct**
   (b) DNS
   (c) ARP
   (d) ICMP

6. [1 mark] Can a PC have a default route?
   (a) Yes **Correct**
   (b) Yes, but only if it **is** directly connected to a router
   (c) Yes, but only if it **is not** directly connected to a router
   (d) No
   (e) How should I know? I didn't pay attention to the Lab 4 Post-lab questions!

7. [1 mark] When does a host device use a default route?
   (a) Never
   (b) Always (for every network interaction)
   (c) Only to reach devices it knows are in the same subnet
   (d) Only to reach devices it knows are **not** on the same subnet **Correct**
   (e) It completely depends on the protocol being used.

8. [1 mark] Which protocols can be considered “secure”?
   (a) IPv4 and IPv6
   (b) TCP and UDP
   (c) HTTPS and SSH **Correct**
   (d) DHCP, DNS, and ARP
   (e) HTTP and TFTP

9. [1 mark] What do the following protocols have in common?
   ARP, DNS, HTTP, TFTP, IP
   (a) they are all application layer protocols
   (b) they all use TCP for their transport layer
   (c) the are all considered secure
   (d) they don't require any passwords or authentication **Correct**
   (e) none of the above

10. [1 mark] What do the following protocols have in common?
    HTTP, FTP, Telnet, SMTP
    (a) none of them is an application layer protocol
    (b) they all use TCP for their transport layer **Correct**
    (c) the are all considered secure
    (d) they don't require any passwords or authentication
    (e) none of the above

11. [1 mark] What port does HTTP use on the **client** side? (Can you remember you lab work?)
    (a) 0
    (b) 1
    (c) 80
    (d) any port from 1 – 1023
    (e) any port from 1024 – 65534 **Correct**

12. [1 mark] What port does HTTP use on the **server** side? (Can you remember you lab work?)
    (a) 0
    (b) 1
    (c) 80 **Correct**
    (d) any port from 1 – 1023
    (e) any port from 1024 – 65534

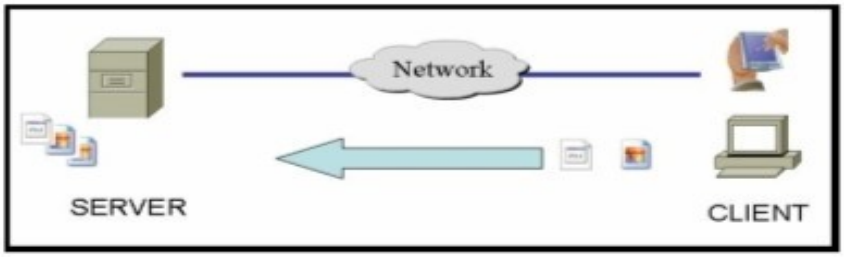
13. [1 mark] By the time a (modern, network-aware) application's data is being transferred over the wire, what layers of addressing have been added?
   (a) protocol, transport, physical
   (b) network access, transport, internet **Correct**
   (c) transport, physical, network access
   (d) application, presentation, session
   (e) none are needed.

14. [1 mark] Which of the following is **not** network aware?
   (a) Telnet
   (b) TFTP
   (c) HTTP
   (d) SSH
   (e) *All* of the above are network aware. **Correct**

15. [1 mark] Which of the following is **not** a valid UDP port number?
   (a) 1
   (b) 1023
   (c) 1024
   (d) 65534
   (e) 65535 **Correct**

16. [1 mark] When is the ACK flag present?
   (a) In all UDP datagrams
   (b) In all TCP segments
   (c) In every TCP segment except the first **Correct**
   (d) In every UDP datagram except the first
   (e) In every one of the 3-way handshake segments

17. [1 mark] Referring to the diagram, which term applies to a data transfer in the direction indicated by the large arrow?



   (a) download
   (b) data read
   (c) data write
   (d) upload **Correct**
   (e) none of the above

18. [1 mark] A network administrator is troubleshooting failed access to www.google.ca. Typing the IP address of the web server into the browser successfully brings up the web page. What application layer protocol is responsible for the failure?
   (a) DHCP
   (b) DNS **Correct**
   (c) ARP
   (d) HTTP
   (e) HTTPS

19. [1 mark] Which of the following is **not** a characteristic of TCP?
   (a) reliable
   (b) compact (8 byte) headers **Correct**
   (c) reassembles messages at destination host
   (d) resends anything **not** received
   (e) connection-oriented

20. [1 mark] Which of the following best describes multiplexing?
   (a) Breaking a data stream into smaller chunks
   (b) Interleaving data from several sources over a single media **Correct**
   (c) A computer processing multiple programs at the same time
   (d) Having redundant routes for data
   (e) Having more than one interface for use with the routing table

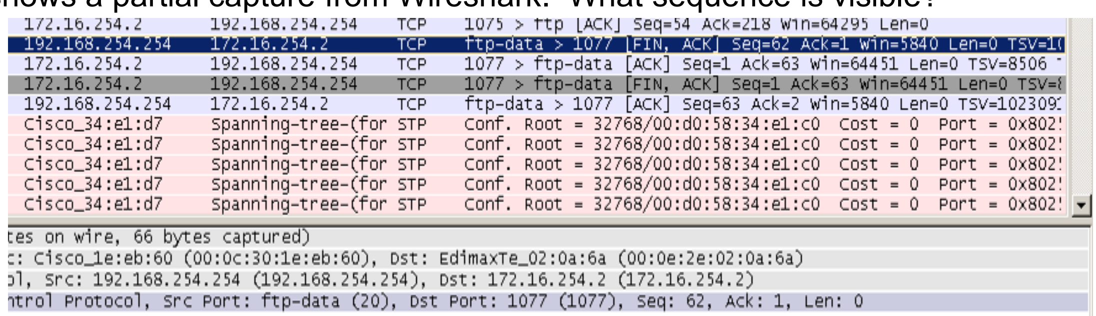
21. [1 mark] Which of the following is **not** a correct sentence?
   (a) Protocols … allow interoperability
   (b) Protocols … are a good thing
   (c) Protocols … make it more difficult to design components that fit into a larger system **Yup**
   (d) Protocols … are general guidelines rather than absolute requirements
   (e) Protocols … allow the possibility of changing one layer without affecting any other layer

22. [1 mark] What makes multiplexing possible?
   (a) MAC addresses
   (b) IP addresses
   (c) port numbers **Correct**
   (d) the binary number system (only two symbols)
   (e) chewing gum

23. [1 mark] From our lab work and given only the five choices below, which field listed in the header (right) would be altered by a router as it passed through?
   (a) Version
   (b) Identification
   (c) Time to Live **Correct**
   (d) Source address
   (e) Destination address

Version	IHL	Type of Service	Total Length	
Identification			Flags	Fragment Offset
Time to Live		Protocol	Header Checksum	
Source Address				
Destination Address				
Options (optional)				

24. [1 mark] The figure shows a partial capture from Wireshark. What sequence is visible?
   (a) 3-way handshake
   (b) 4-way handshake
   (c) 3-way teardown
   (d) 4-way teardown **Y**
   (e) 4-layer OSI model



25. [1 mark] What is a socket?
   (a) the combination of an IP address and a port number **Correct**
   (b) one the fields in a header
   (c) the name of the PDU for layer 5
   (d) a specially crafted PDU used by traceroute
   (e) none of the above.

26. [1 mark] What is the exact command you would use under WinXP to determine how "far" the computer "www.google.ca" is from yours?
   (a) tracert www.google.ca **Correct**
   (b) traceroute www.google.ca
   (c) traceroute -d www.google.ca
   (d) ping www.google.ca (and then pay close attention to the number of ms it takes)
   (e) ping -i 1 www.google.ca (and then pay close attention to the number of ms it takes)

27. [1 mark] What WinXP command gives your IP information (address, mask, gateway, etc)?
   (a) ifconfig
   (b) ipconfig **Correct**
   (c) msconfig
   (d) netstat -r
   (e) route print

28. [1 mark – **Bonus**] A student issues the command "route DELETE 0.0.0.0" in WinXP. This command:
   (a) has an excellent chance of fixing network routing problem on the PC (it's an invalid route)
   (b) will probably cause some serious problems for networking on the PC **Correct**
   (c) will completely stop the PC from reaching any other devices on the network
   (d) probably won't change anything (related to networking) on the PC
   (e) isn't a valid command

29. [1 mark] A rule or set of rules that describe how communication takes place is known as a:
   (a) function
   (b) protocol **Correct**
   (c) conversation
   (d) handshake
   (e) pain for students to memorize

30. [1 mark – **Bonus**] Which of the following is an invalid mask?
   (a) 0.0.0.0
   (b) 2.0.0.0 **Correct**
   (c) 224.0.0.0
   (d) 255.255.0.0
   (e) 255.255.255.255

31. [1 mark - **Bonus**] A student practicing in the lab gets the following output under WinXP:

```
===========================================================================
Interface List
0x1 ........................... MS TCP Loopback interface
0x3 ......00 23 26 b6 a0 61 .. Intel(R) 82567LM Gigabit Network Connection
0x20002 ..00 21 6a 8a 10 a8 .. Intel(R) WiFi Link 5300 AGN
===========================================================================
Active Routes:
Network Destination        Netmask          Gateway    Interface  Metric
        127.0.0.0        255.0.0.0        127.0.0.1    127.0.0.1       1
  255.255.255.255  255.255.255.255  255.255.255.255            3       1
  255.255.255.255  255.255.255.255  255.255.255.255        20002       1
===========================================================================
```

Where would a packet destined to 192.168.254.254 (eg. Eagle-server) go?

(a) out the interface with address 127.0.0.1
(b) out the interface numbered 3
(c) out the interface numbered 20002
(d) out the loopback interface
(e) nowhere; the destination is unreachable **Correct**

32. [1 mark] Given the IP address 10.10.10.218/27, what is the broadcast address for its subnet?

(a) 10.10.10.255
(b) 10.10.10.223 **Correct**
(c) 10.10.10.192
(d) 10.10.10.127
(e) 10.10.10.0

33. [1 mark] What subnet mask would be used with hosts in the 128.107.176.0/13 network?

(a) 255.0.0.0
(b) 255.248.0.0 **Correct**
(c) 255.255.252.0
(d) 255.255.255.0
(e) 255.255.255.252

34. [1 mark] How many usable host addresses exist in the subnet 10.11.12.55/26?

(a) 16
(b) 30
(c) 32
(d) 62 **Correct**
(e) 64

35. [2 marks] Which IP address is a subnet address?

(a) 12.12.12.12/30 **Correct**
(b) 20.20.20.20/29
(c) 24.24.24.24/28
(d) 24.24.24.24/27
(e) none of the above

36. [2 marks] What is the first and last usable address for 32.32.32.32/30?
   (a) 32.32.32.30 and 32.32.32.32
   (b) 32.32.32.32 and 32.32.32.34
   (c) 32.32.32.32 and 32.32.32.35
   (d) 32.32.32.33 and 32.32.32.34 **Correct**
   (e) 32.32.32.33 and 32.32.32.35

37. [3 marks] Given a starting network of 1.2.3.0/24 that is subnetted into 4 subnets, what is the broadcast address of subnet #1?
   (a) 1.2.3.63
   (b) 1.2.3.126
   (c) 1.2.3.127 **Correct**
   (d) 1.2.3.191
   (e) none of the above

38. [2 marks] Given a network address of 192.168.1.0/24, what is the maximum number of subnets you can create if each subnet must support at least thirty-two (32) hosts?
   (a) 4 **Correct**
   (b) 8
   (c) 16
   (d) 32
   (e) 64

39. [1 mark] Which of the following is the correct representation of mask 255.255.192.0?
   (a) /10
   (b) /12
   (c) /16
   (d) /18 **Correct**
   (e) /26

40. [2 marks] A starting network 64.32.16.0/24 is subnetted into smaller subnets. Given the subnet ID 64.32.16.48/28, which subnet is this?
   (a) #1
   (b) #2
   (c) #3 **Correct**
   (d) #4
   (e) none of the above

41. [2 marks] Given a starting network of 99.99.99.0/23, what is the number of usable hosts when subnetting to provide 8 subnets with as few extra subnets as possible?
   (a) 30
   (b) 32
   (c) 62 **Correct**
   (d) 64
   (e) 126

42. [1 mark] Which of the following is **not** a correct pairing?
   (a) network – frame **Correct**
   (b) network access – frame
   (c) Internet – packet
   (d) transport – datagram
   (e) transport – segment

43. [1 mark] Which of the following is **not** a valid reason for subnetting?
   (a) address management
   (b) performance
   (c) physical location
   (d) security
   (e) all of the above are valid reasons for subnetting **Correct**

44. [1 mark] A car seat belt has two parts that click together. What are the names of those two parts? [**Bonus**]
   (a) buckle and snap
   (b) buckle and clip
   (c) clip and snap
   (d) buckle and tongue **Correct**
   (e) tongue and retractor