

Midterm: CST8103 Networking Basics

Fall 2012

Time: 95 minutes; Total Marks available: 62 marks

(Allocation of marks is shown beside each question)

Version A

STOP!

Mark your test version in the field titled "Grade or Educ" on the scantron form.

(A = 1, B = 2, C = 3)

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.
 - (1) A
 - (2) B
 - (3) C
 - (4) D

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

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

4. [1 mark] What application protocol is used to *send* email?
 - (a) POP
 - (b) UDP
 - (c) TCP
 - (d) SMTP
 - (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
 - (b) DNS
 - (c) ARP
 - (d) ICMP

6. [1 mark] Can a router have a default route?
 - (a) Yes
 - (b) Yes, but only if it **is** directly connected to a switch
 - (c) Yes, but only if it **is not** directly connected to a switch
 - (d) No

7. [1 mark] When does a router use a default route?
- (a) Never
 - (b) Always (for every network interaction)
 - (c) For packets of unknown networks
 - (d) To send to remote hosts
 - (e) It completely depends on the protocol being used.
8. [1 mark] Which protocols can be considered “secure”?
- (a) HTTPS and SMB
 - (b) TCP and UDP
 - (c) HTTPS and SSH
 - (d) DHCP, DNS, and ARP
 - (e) HTTP and TFTP
9. [1 mark] What do the following protocols have in common?
SMTP, POP, HTTP, TFTP
- (a) they are all application layer protocols
 - (b) they all use TCP for their transport layer
 - (c) they are all considered secure
 - (d) they don't require any passwords or authentication
 - (e) none of the above
10. [1 mark] What entry will be added to a client's ARP cache following a ping of a remote host?
- (a) None – ARP is not used for remote communications
 - (b) The remote host's MAC address
 - (c) The client's gateway MAC address
 - (d) The client's MAC address
 - (e) none of the above
11. [1 mark] What port does HTTP use on the **client** side? (Can you remember your lab work?)
- (a) 0
 - (b) 1
 - (c) 80
 - (d) any port from 1 – 1023
 - (e) any port from 1024 – 65534
12. [1 mark] What port does DNS use on the **server** side? (Can you remember your lab work?)
- (a) 0
 - (b) 1
 - (c) 53
 - (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) Data Link, network, transport
 - (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.*
15. [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
 - (c) ARP
 - (d) HTTP
 - (e) HTTPS
16. [1 mark] Which of the following is **not** a characteristic of TCP?
- (a) reliable
 - (b) (20 byte) headers
 - (c) reassembles messages at destination host
 - (d) receiver requests resends of anything **not** received
 - (e) connection-oriented
17. [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
 - (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
18. [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
 - (d) Protocols ... are general guidelines rather than absolute requirements
 - (e) Protocols ... allow the possibility of changing one layer without affecting any other layer

19. [1 mark] What makes multiplexing possible?
- (a) MAC addresses
 - (b) IP addresses
 - (c) port numbers
 - (d) the binary number system (only two symbols)
 - (e) chewing gum

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

20. [1 mark] Assuming a packet originating from a private network (address) and destined for a public address, which field listed in the header (right) will be changed by the NAT process?
- (a) Version
 - (b) Identification
 - (c) Time to Live
 - (d) Source address
 - (e) Destination address

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[+] Internet Protocol Version 4, Src: 64.170.98.30 (64.170.98.30), Dst: 192.168.15.107 (192.168.15.107)
[-] Transmission Control Protocol, Src Port: http (80), Dst Port: 58742 (58742), Seq: 7561, Ack: 303, Len: 762
    Source port: http (80)
    Destination port: 58742 (58742)
    [Stream index: 1]
    Sequence number: 7561 (relative sequence number)
    [Next sequence number: 8323 (relative sequence number)]
    Acknowledgement number: 303 (relative ack number)
  
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Capture 1: Partial Wireshark capture to be used with the next two questions.

21. [1 mark] Capture 1 represents a transmission in the following direction?
- (a) Server to client
 - (b) Client to server
 - (c) Peer to peer
 - (d) Impossible to tell
22. [1 mark] What can you conclude from the Sequence or Acknowledgment numbers?
- (a) 8323 data bytes have been received by the server
 - (b) 302 data bytes have been received by the server
 - (c) The server expects the sequence number of the next client segment to be 8323
 - (d) Nothing!

23. [1 mark] A UDP session always begins with a segment of the following type?
- (a) ACK
 - (b) SYN
 - (c) CONNECT
 - (d) None of the above
24. [1 mark] A TCP session always ends with a segment of the following type?
- (a) ACK
 - (b) FIN
 - (c) END
 - (d) None of the above
25. [1 mark] What Windows command gives your IP information (address, mask, gateway, etc)?
- (a) ifconfig
 - (b) ipconfig
 - (c) msconfig
 - (d) netstat -r
 - (e) route print
26. [1 mark] A rule or set of rules that describe how communication takes place is known as a:
- (a) function
 - (b) protocol
 - (c) conversation
 - (d) handshake
 - (e) pain for students to memorize
27. [1 mark] Which of the following is an invalid mask?
- (a) 248.0.0.0
 - (b) 194.0.0.0
 - (c) 224.0.0.0
 - (d) 255.255.0.0
 - (e) 255.255.255.255
28. [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
 - (c) 10.10.10.192
 - (d) 10.10.10.127
 - (e) 10.10.10.0
29. [1 mark] What subnet mask would be used with hosts in the 128.107.176.0/22 network?
- (a) 255.0.0.0
 - (b) 255.248.0.0
 - (c) 255.255.252.0
 - (d) 255.255.255.0
 - (e) 255.255.255.252

30. [1 mark] How many usable host addresses exist in the subnet 10.11.12.55/27?
- (a) 16
 - (b) 30
 - (c) 32
 - (d) 62
 - (e) 64
31. [2 marks] What is the first and last usable address for 192.168.1.32/30?
- (a) 192.168.1.30 and 192.168.1.32
 - (b) 192.168.1.32 and 192.168.1.34
 - (c) 192.168.1.32 and 192.168.1.35
 - (d) 192.168.1.33 and 192.168.1.34
 - (e) 192.168.1.33 and 192.168.1.35
32. [1 mark] Which of the following is the correct representation of mask 255.255.254.0?
- (a) /10
 - (b) /24
 - (c) /23
 - (d) /18
 - (e) /26
33. [1 mark] Which of the following is **not** a correct pairing?
- (a) network – frame
 - (b) network access – frame
 - (c) Internet – packet
 - (d) physical – bit
 - (e) transport – segment
34. [1 mark] Which of the following is **not** in network 10.10.10.128/25?
- (a) 10.10.10.255/25
 - (b) 10.10.10.129/25
 - (c) 10.10.10.50/25
 - (d) None – they are all belong to the same network.
35. [1 mark] The DHCP protocol?
- (a) Assigns an IP to a requesting client
 - (b) Assigns an IP to a server
 - (c) Translate a server name to an IP
 - (d) It is not a protocol!
36. [1 mark] Hosts on different network communicate using?
- (a) Enterprise firewall
 - (b) Switch
 - (c) Their respective default gateway address
 - (d) The Internet

37. [1 mark] Hosts on same network do not require?
- (a) IP addressing
 - (b) MAC addressing
 - (c) A router
 - (d) DHCP
38. [1 mark] What is not a characteristic of the IP protocol?
- (a) Unreliable
 - (b) Low overhead
 - (c) Media dependent
 - (d) Connectionless
39. [1 mark] What protocol helps discover the MAC for an IP address?
- (a) DNS
 - (b) DHCP
 - (c) ARP
 - (d) ARPA
40. [1 mark] You have been tasked with subnetting IP address 200.10.23.20/24 into 8 networks. How many host bits need to be borrowed?
- (a) 2
 - (b) 3
 - (c) 4
 - (d) 5
41. [1 mark] You have been tasked with subnetting IP address 200.10.23.20/24 into 8 networks. How many host bits are left?
- (a) 2
 - (b) 3
 - (c) 4
 - (d) 5
42. [1 mark] Which connection type requires a cross-over cable?
- (a) PC to Switch
 - (b) Switch to Router
 - (c) PC to Router
 - (d) Laptop to Switch
43. [1 mark] Convert 201 to binary.
- (a) 1100 1001
 - (b) 1010 1010
 - (c) 1001 0011
 - (d) 0100 1010
 - (e) 1010 1010

44. [2 marks] Given the IP and Mask 10.193.223.178/12 determine the broadcast address
- (a) 10.193.223.255
 - (b) 10.193.255.255
 - (c) 10.206.255.255
 - (d) 10.207.255.255
 - (e) 10.255.255.255
45. [1 mark] Which of the following could be used to remember the correct ordering, *from top to bottom*, of network layers in the OSI model?
- (a) All People Should Teach Networking Daily Please
 - (b) All Things Inspire Networking
 - (c) Please Do Not Throw Pizza Sauce Away
 - (d) Please Do Not Touch Steve's Pet Alligator
 - (e) none of the above
46. [1 mark] Convert to dotted decimal: 10000001110000001110000000000001
- (a) 128.192.224.1
 - (b) 128.224.224.1
 - (c) 129.224.224.1
 - (d) 129.192.224.1
47. [1 mark] Which statement is **not** true about ping?
- (a) Ping uses the ICMP protocol
 - (b) The two Ping messages are Echo Request and Echo Reply
 - (c) The Ping results provide conclusive connectivity information
 - (d) None of the above
48. [1 mark] What is **not** true about a router?
- (a) A layer 4 device
 - (b) A layer 3 device
 - (c) Requires at least two interfaces
 - (d) Each interface corresponds to a unique network segment
49. [1 mark] What combination is invalid?
- (a) Application HTTP, FTP, SMTP, TFTP
 - (b) Transport UDP, TPC
 - (c) Network IPv4
 - (d) Data Link Ethernet
50. [1 mark] A computer configured to obtain an IP address automatically will obtain its IP address from which server?
- (a) HTTP server
 - (b) DNS server
 - (c) DHCP server
 - (d) ISP Router

51. [1 mark] Which device should be configured with a static IP address?
- (a) Laptop
 - (b) Smart Phone
 - (c) DHCP server
 - (d) Desktop
52. [3 mark] For IP 172.10.126.66/26, what are the network and broadcast address, first and last host IP address and number of host that can exist in the subnet?
- (a) 172.10.126.66, 172.10.126.128, 172.10.126.65, 172.10.126.126, 62
 - (b) 172.10.126.64, 172.10.126.127, 172.10.126.65, 172.10.126.126, 64
 - (c) 172.10.126.64, 172.10.126.127, 172.10.126.65, 172.10.126.126, 62
 - (d) 172.10.126.0, 172.10.126.255, 172.10.126.1, 172.10.126.254, 254
53. [2 mark] Do hosts 172.10.10.124/25 and 172.10.10.130/25 belong to the same network?
- (a) Yes
 - (b) No
54. [1 mark] Which of the following transport protocols is used when surfing the web?
- (a) POP
 - (b) UDP
 - (c) TCP
 - (d) SMTP
 - (e) HTTP
55. [1 mark] Messages GET / HTTP/1.1 and HTTP/1.1 200 OK are associated to which layer?
- (a) Layer 4
 - (b) Layer 3
 - (c) Layer 7
 - (d) Layer 1
56. [1 mark] You have been given address 200.192.12.0/24 and tasked with subnetting into exactly 32 networks. How many bits do you need to borrow?
- (a) 4
 - (b) 6
 - (c) 5
 - (d) 3
57. [1 mark] You have been given address 200.192.12.0/24 and tasked with subnetting into exactly 32 networks. How many hosts' bits are left after the borrowing process?
- (a) 4
 - (b) 2
 - (c) 3
 - (d) 5