

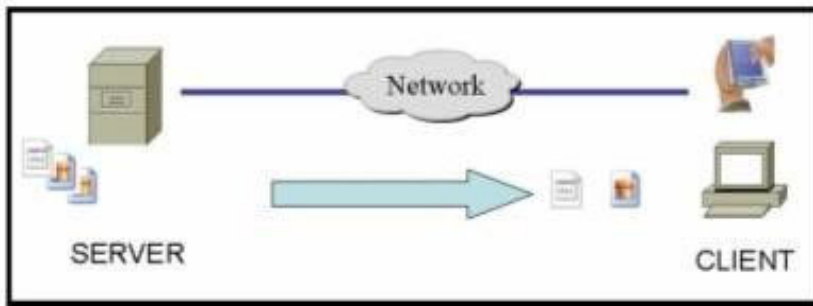
Version A

Name: _____

Time: 60 minutes; Test scored out of: 60 marks Total Marks available: 66 marks

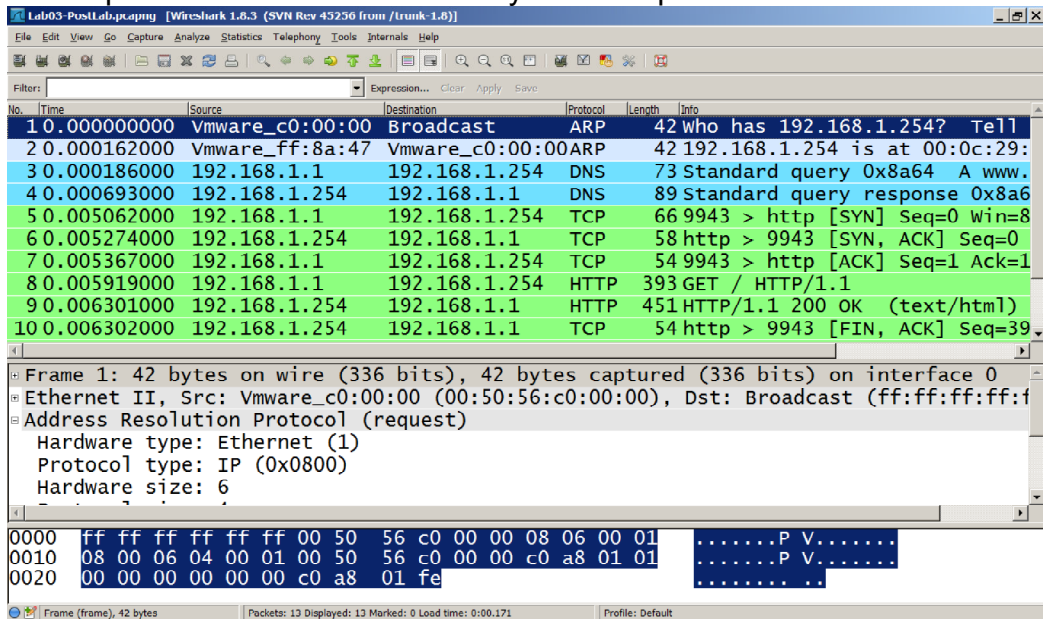
(All questions are worth 1 mark unless otherwise indicated.)

1. Which of the following is the order of layers in the OSI model, from top to bottom? (p. 140)
 - A. Application, Presentation, Session, Transport, Network Access, Physical
 - B. Physical, Data Link, Network, Transport, Session, Presentation, Application
 - C. Application, Transport, Internet, Network Access
 - D. Network Access, Internet, Transport, Application
 - E. Application, Presentation, Session, Transport, Network, Data Link, Physical
2. Referring to the diagram below, which term applies to a data transfer in the direction indicated by the arrow?



- A. download
 - B. data read
 - C. data write
 - D. none of the above
 - E. upload
3. Which of the following are "intermediary devices"? Choose **all** that apply. (p. 16)
 - A. firewall
 - B. server
 - C. switch
 - D. router
 - E. host

4. The wireshark capture below shows how many different protocols?



- A. 1 B. 2 C. 3 D. 4 E. 5

5. What items are required for an end device to do any real, serious networking? Choose **all** that apply.

- A. mask
- B. Microsoft Windows OS
- C. DNS address
- D. gateway address
- E. IP address

6. [2 marks] Given the IP and Mask 177.136.223.178/11 determine the broadcast address

- A. 177.136.255.255
- B. 177.255.255.255
- C. 177.136.223.255
- D. 177.139.255.255
- E. 177.159.255.255

7. Which of the following protocols correspond to the Transport layer? Choose two. (p. 130, 158)

- A. FTP B. TCP C. DNS D. UDP E. HTTP

8. Which of the following protocols use TCP for their transport? Choose **all** that apply.

- A. FTP B. TFTP C. POP D. HTTP E. Telnet

9. How many usable host addresses exist in the subnet 97.86.75.64/27?
- A. 30
 - B. 32
 - C. 62
 - D. 64
 - E. 16
10. Which field is modified so that traceroute gets responses from increasingly distant devices?
- A. ICMP type
 - B. ICMP flags
 - C. IP TTL
 - D. IP checksum
 - E. ICMP checksum
11. What is the name given to a one-to-many message delivery option? (p. 156)
- A. multicast
 - B. full-duplex
 - C. broadcast
 - D. unicast
 - E. manycast
12. Which of the following port(s) are used by FTP? Choose all that apply.
- A. 23
 - B. 20
 - C. 21
 - D. none of the above
 - E. 22
13. MAC addresses correspond to which network layer? (p. 147)
- A. the Network Access layer
 - B. Layer 3
 - C. Layer 1
 - D. Layer 7
 - E. Layer 4
14. Which of the following could be used to remember the correct ordering, from top to bottom, of the layers in the OSI model?
- A. Please Do Not Throw Pizza Sauce Away
 - B. All Things Inspire Networking
 - C. All People Should Teach Networking Daily Please
 - D. Please Do Not Touch Steve's Pet Alligator
 - E. none of the above

15. Which end(s) of a connection use(s) a "well known" port as it's local port?
- A. the client
 - B. either client or server, but not both
 - C. the server
 - D. either client or server, but only for peer-to-peer connections
 - E. both client and server
16. A "peer-to-peer" device (p. 13):
- A. accepts or processes requests
 - B. makes or sends requests
 - C. both sends and accepts requests
 - D. uploads data
 - E. downloads data
17. [2 marks] What is the first and last usable address for 1.2.3.4/30?
- A. 1.2.3.4 and 1.2.3.7
 - B. 1.2.3.5 and 1.2.3.6
 - C. 1.2.3.0 and 1.2.3.3
 - D. 1.2.3.1 and 1.2.3.4
 - E. none of the above
18. Which of the following are "end devices"? Choose **all** that apply. (p. 16)
- A. security cameras
 - B. servers
 - C. network printers
 - D. mobile network devices (ie. smartphone, etc)
 - E. VoIP phones
19. Identify the type(s) of addresses available in IPv4. Choose **all** that apply.
- A. multicast
 - B. anycast
 - C. broadcast
 - D. typecast
 - E. unicast
20. What is true about the Network and Host portions of IPv4 addresses?
- A. The Network portion plus the Host portion are at most 32 bits
 - B. The Network portion is always shorter than the Host portion
 - C. The Network portion is always longer than the Host portion
 - D. The Network portion is required; the Host portion is optional
 - E. The Network portion plus the Host portion always add up to 32 bits

21. [Bonus] Which of the following addresses could never appear in a Wireshark capture?
- A. 172.16.255.255
 - B. 128.255.255.255
 - C. 127.0.0.1
 - D. 172.16.255.254
 - E. 255.255.255.255
22. Given the IP address 1.2.3.4/27, what is the broadcast address for its subnet?
- A. 1.2.3.63
 - B. 1.2.3.255
 - C. 1.2.3.127
 - D. 1.2.3.64
 - E. 1.2.3.31
23. When does an end-device **require** a default gateway?
- A. To reach the loopback address
 - B. To reach devices that are **not** on the local subnet
 - C. To reach devices on the local subnet
 - D. To reach the broadcast address
 - E. To reach **any** other device
24. What is the broadcast address for a host with IP address 8.172.47.10/15?
- A. 8.172.47.255
 - B. 8.172.255.255
 - C. 8.191.255.255
 - D. 8.173.255.255
 - E. 8.173.47.255
25. What protocol is used to discover the MAC address of any host on the same local network? (p. 149)
- A. host address
 - B. ARP
 - C. Default GW
 - D. WAP
 - E. Frame header
26. A "host" is defined as (p. 13):
- A. any end-device
 - B. any client
 - C. any server
 - D. any peer-to-peer device
 - E. any intermediate device

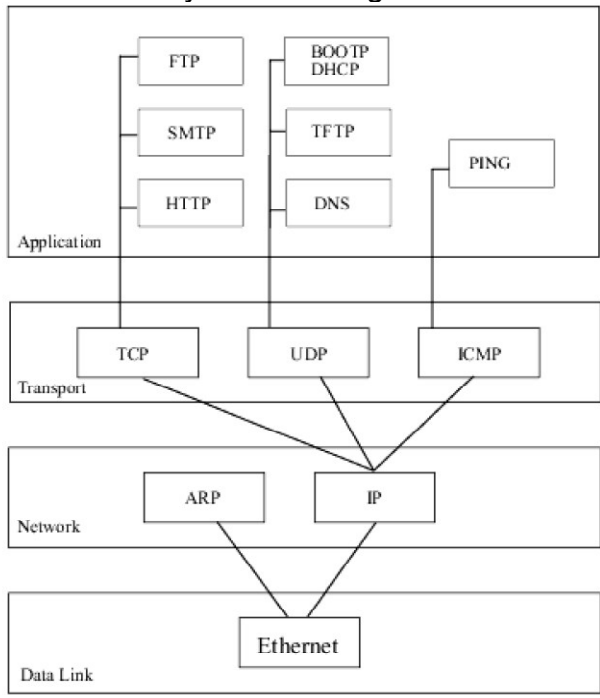
27. What does "encapsulation" mean? Choose the **best** answer! (p. 145)
- A. Adding extra information to a PDU
 - B. Converting data to individual bits to be placed on the physical media
 - C. Moving down the layers in the network model
 - D. Removing extra information from a PDU
 - E. Moving up the layers in the network model
28. IP addresses correspond to which layer of the OSI model? (p. 147)
- A. Layer 3
 - B. Layer 1
 - C. the Network Access layer
 - D. Layer 4
 - E. Layer 7
29. Which of the following protocols allow *anonymous* usage? Choose **all** that apply.
- A. Telnet B. HTTP C. TFTP D. FTP E. POP
30. [2 marks] Which IP address is actually a subnet address?
- A. 42.44.46.48/28
 - B. 21.22.23.24/29
 - C. 65.54.43.32/27
 - D. 13.14.15.16/30
 - E. all of the above
31. [0 marks] What version of the test do you have?
Make sure you have also filled in the correct bubble for "Test Version" on the answer sheet!!
- A. a B. b C. c D. d E. e
32. What is a default gateway?
- A. It is the "gateway" server where a client retrieves email using POP (rather than SMTP!)
 - B. It is an end device
 - C. It is a router
 - D. It is the packet processing part of a Firewall
 - E. It is a switch
33. A network that is accessible and available only to people within a company or organization is called (p. 24):
- A. internet B. extranet C. intranet D. ultranet E. entranet

34. What is the correct Wireshark filter expression to see only ARP and ping?
- A. arp || icmp
 - B. ARP or ping
 - C. ARP or icmp
 - D. ARP || ping
 - E. ARP || ICMP
35. "Clients" are network devices that (p. 13):
- A. both send and accept requests
 - B. upload data
 - C. make or send requests
 - D. accept or process requests
 - E. download data
36. [2 marks] Given a starting network of 218.37.124.0/24 that is subnetted into 4 subnets, what is the subnet ID for the first subnet?
- A. 218.37.124.64/24
 - B. 218.37.124.0/26
 - C. 218.37.124.128/26
 - D. 218.37.124.0/24
 - E. 218.37.124.64/26
37. What type of information would be found on a **logical topology** diagram? (p. 56)
- A. length and type of all cable runs
 - B. location of intermediary devices
 - C. IP addressing scheme
 - D. colouring of cabling used at each location
 - E. location of departmental printer
38. The "Network Access" layer corresponds to (p. 142):
- A. L4
 - B. L1 & L2
 - C. L2
 - D. L3
 - E. L2 & L3
39. Which special IPv4 address means "me"?
- A. 127.0.0.0
 - B. 255.255.255.255
 - C. 0.0.0.0
 - D. 127.0.0.1
 - E. 0.0.0.1

40. "Servers" are network devices that (p. 13):
- A. make or send requests
 - B. both send and accept requests
 - C. accept and process requests
 - D. download data
 - E. upload data
41. How many different **local broadcast** IP addresses exist? Choose the best answer.
- A. none (0)
 - B. one (1)
 - C. two (2)
 - D. one for each subnet
 - E. more than I can possibly count
42. How does a server choose which port to use?
- A. It chooses one port completely randomly
 - B. It chooses one port randomly from a certain range
 - C. It chooses sequential ports, one for each new connection
 - D. It chooses a new port randomly for each new connection
 - E. There is no "choice"; servers are configured for a specific, fixed port
43. Which of the following is a IPv4 **local broadcast** address? Choose **all** that apply.
- A. 127.0.0.1
 - B. 0.0.0.0
 - C. 10.0.0.1
 - D. 255.255.255.255
 - E. 255.255.255.0
44. [Bonus] **Email** addresses correspond to which network layer?
- A. Layer 1
 - B. Layer 3
 - C. Layer 7
 - D. the Network Access layer
 - E. Layer 4
45. What is the correct order of PDUs, from top to bottom, in the OSI model? (p. 145)
- A. Data, Packet, Frame, Bits
 - B. Frame, Packet, Segment, Data
 - C. Data, Segment, Packet, Frame, Bits
 - D. Data, Segment, Packet, Frame
 - E. Bits, Frame, Packet, Segment, Data

46. Convert the binary value 11010111 to decimal.
- A. 215
 - B. 175
 - C. 201
 - D. 235
 - E. 222
47. Which of the following is **not** a valid IPv4 mask?
- A. 255.0.0.0
 - B. 192.0.0.0
 - C. 127.0.0.0
 - D. 128.0.0.0
 - E. 224.0.0.0
48. In networking, what is a three-way handshake?
- A. It's a feature of Google's newest QUIC protocol that speeds up connections
 - B. It's the initial exchange of packets for *any* TCP session
 - C. It's the initial exchange of packets in a TFTP session (as seen in lab 3)
 - D. A connection made between three devices in a peer-to-peer network
 - E. It's the initial exchange of packets in a TCP session for FTP
49. Which of the following are valid acronyms (abbreviations) for types of networks? Choose **all** that apply. (p. 21)
- A. MAN
 - B. SAN
 - C. CAN
 - D. LAN
 - E. WAN
50. How does a client choose which port to use?
- A. It chooses the exact same port as the server
 - B. It chooses one port randomly, from within the well-known range
 - C. It chooses one port randomly, from outside the well-known range
 - D. There is no "choice"; clients are configured for specific, fixed ports
 - E. Clients don't choose, only servers choose the port(s)

51. Here's another version of a diagram for the Networking model. Examine it carefully. What OSI layers correspond to the bottom layer in the diagram?



- A. Layer 2 and Physical Layer
- B. Physical Layer
- C. Layer 2
- D. Layer 1
- E. Data Link

52. What are "well known" ports?

- A. Ports 0 and 65535
- B. Port numbers that students are always forced to memorize
- C. Ports between 49152-65534
- D. Ports between 0-1023
- E. Ports between 1024-49151

53. Which of the following are characteristics of TCP? Check **all** that apply.

- A. connection-oriented
- B. ordered data reconstruction
- C. flow control
- D. stateful protocol
- E. reliable delivery of data

54. What DOS command shows your network settings? (Ref: lab work)

- A. ipconfig
- B. arp
- C. netsh
- D. netstat
- E. ping

55. What subnet mask would be used with hosts in the 15.16.0.0/12 network?
- A. 15.16.255.255
 - B. 15.15.255.255
 - C. 255.240.0.0
 - D. 255.16.0.0
 - E. 15.31.255.255
56. Convert the decimal value 201 to binary.
- A. 0100 1010
 - B. 1010 1010
 - C. 1010 1010
 - D. 1100 1001
 - E. 1001 0011
57. What is a network socket?
- A. It is a combination of the client and server ports
 - B. It is a combination of the client and server IP addresses
 - C. It's similar to a power socket but is used to charge network devices, such as laptops, tablets and smartphones.
 - D. It is a combination of an IP address and a MAC address
 - E. It is a combination of an IP address and a port
58. [Bonus] Consider a Wireshark capture of the traceroute command to a host that is 10 hops away. The majority of ICMP messages returning to the host would be:
- A. ICMP *destination host unreachable* messages
 - B. ICMP *time to live expired* messages
 - C. ICMP *destination host unknown* messages
 - D. ICMP echo request messages
 - E. ICMP echo reply messages
59. Convert the CIDR mask "/21" into dotted quad notation.
- A. 255.128.0.0
 - B. 252.0.0.0
 - C. 255.252.0.0
 - D. 255.255.248.0
 - E. 255.255.128.0
60. What is a RFC?
- A. It is a (older) file transfer protocol (like FTP, TFTP, and SMB)
 - B. It is a port that is (actively) Registered For Connection
 - C. It is a Request For Comments document that defines a network standard
 - D. It is a Router Forwarding Connection, that is actively forwarding packets
 - E. Trick question; it's actually a mis-spelling of "KFC"

61. Which of the following best describes an IPv4 network broadcast address?
- A. All 0 bits plus a rightmost 1 bit in the host portion of the address
 - B. All 1 bits plus a rightmost 1 bit in the host portion of the address
 - C. All 1 bits in the host portion of the address
 - D. All 0 bits in the host portion of the address
 - E. Any address ending in ".255"
62. Convert the dotted quad mask 255.224.0.0 into CIDR "/xx" notation.
- A. /9
 - B. /3
 - C. /11
 - D. /19
 - E. /24
63. How many different **directed broadcast** IP addresses exist? Choose the best answer.
- A. none (0)
 - B. one (1)
 - C. two (2)
 - D. one for each subnet
 - E. more than I can possibly count

(All questions are worth 1 mark unless otherwise indicated.)

Answer Section

1.	ANS: E	PTS: 1
2.	ANS: A	PTS: 1
3.	ANS: A, C, D	PTS: 1
4.	ANS: D	PTS: 1
5.	ANS: A, C, D, E	PTS: 1
6.	ANS: E	PTS: 2
7.	ANS: B, D	PTS: 1
8.	ANS: A, C, D, E	PTS: 1
9.	ANS: A	PTS: 1
10.	ANS: C	PTS: 1
11.	ANS: A	PTS: 1
12.	ANS: B, C	PTS: 1
13.	ANS: A	PTS: 1
14.	ANS: C	PTS: 1
15.	ANS: C	PTS: 1
16.	ANS: C	PTS: 1
17.	ANS: B	PTS: 2
18.	ANS: A, B, C, D, E	PTS: 1
19.	ANS: A, C, E	PTS: 1
20.	ANS: E	PTS: 1
21.	ANS: C	PTS: 1
22.	ANS: E	PTS: 1
23.	ANS: B	PTS: 1
24.	ANS: D	PTS: 1
25.	ANS: B	PTS: 1
26.	ANS: A	PTS: 1
27.	ANS: A	PTS: 1
28.	ANS: A	PTS: 1
29.	ANS: B, C, D	PTS: 1
30.	ANS: E	PTS: 2
31.	ANS: A	PTS: 0
32.	ANS: C	PTS: 1
33.	ANS: C	PTS: 1
34.	ANS: A	PTS: 1
35.	ANS: C	PTS: 1
36.	ANS: B	PTS: 2
37.	ANS: C	PTS: 1
38.	ANS: B	PTS: 1
39.	ANS: D	PTS: 1
40.	ANS: C	PTS: 1

- 41. ANS: B PTS: 1
- 42. ANS: E PTS: 1
- 43. ANS: D PTS: 1
- 44. ANS: C PTS: 1
- 45. ANS: C PTS: 1
- 46. ANS: A PTS: 1
- 47. ANS: C PTS: 1
- 48. ANS: B PTS: 1
- 49. ANS: A, B, D, E PTS: 1
- 50. ANS: C PTS: 1
- 51. ANS: A PTS: 1
- 52. ANS: D PTS: 1
- 53. ANS: A, B, C, D, E PTS: 1
- 54. ANS: A PTS: 1
- 55. ANS: C PTS: 1
- 56. ANS: D PTS: 1
- 57. ANS: E PTS: 1
- 58. ANS: B PTS: 1
- 59. ANS: D PTS: 1
- 60. ANS: C PTS: 1
- 61. ANS: C PTS: 1
- 62. ANS: C PTS: 1
- 63. ANS: D PTS: 1