

**CLOSED
BOOK &
NOTES**

Trenholm State Technical College
PATTERSON CAMPUS
DEPARTMENT OF COMPUTER INFORMATION SYSTEMS
NETWORKING FUNDAMENTALS (DPT161)



FALL Semester 2011

Final Exam

200 Points

Name & Date: _____

IF YOU NEED SPACE TO "CALCULATE", YOU MUST DO SO ON THIS EXAM...IN THE MARGINS, ON THE BACK PAGES, ETC.

8.5 x 11 Cheat Sheet ONLY allowed document on the desktop. This exam is made up of 4 sections: Section I, T/F; Section II, Select the CORRECT Option; Section III, Networking and Subnets; and, Section IV, Scenario Solutions. Each Section is Comprised of 25 Questions, Items, or Other Problem-Types.

SCANTRON SIDE 1: QUESTIONS 1 - 50

SECTION I: T/F SECTION. ALL RESPONSES ARE TO BE MARKED TRUE/FALSE ON THE SCANTRON.

1. IPv4 networks use 5 classes of networking addresses.
2. Port 443 and https occur at the Application Layer.
3. An error in convergence will cause errors in how packets are processed in a switch.
4. In a 150.150.0.0/24 addressing scheme, there will be 256 subnets.
5. A packet is converted into a signal using the Transceiver of the NIC.
6. A 100BaseT NIC is attached to a 10/100/1000Base T switch port; the communication between the NIC and switch will be the highest speed of the switch.
7. The Checksum of a packet is calculated and send by the sender and validated by the receiver. If they agree, the packet is not resent.
8. Every networking device that receives and sends packets has its own physical address.
9. Like devices use patch cables to attach to each other and unlike devices crossover cables.
10. A bit pattern ending in 1 will always be an odd number.
11. Three masking borrowed bits used in a NNNH type of address, will result in 16 subnets.

12. The web browser has no application layer in the TCP Model.
13. IEEE 802.3u operates at 100MBps.
14. When data, segments, packets, frames, and bits are processed by the protocols, encapsulation occurs.
15. ISPs are the actual _____ or what is now being termed _____.
16. The method of ensuring that a packet arrives “alive and well” is called:
17. What are the two **required** addresses for a packet to arrive “alive and well.”
18. The OSI and TCP/IP models have how many layers, respectively.
19. What is the purpose in Packet Tracer?
20. What layer of the OSI is responsible for signal content over the network?
21. The TCP/IP Model application layer handles which of the following protocols?
22. What are the items identified in question 21 called in the networking business?
23. The default gateway is the _____ of the LAN.
24. Which of the following ports are REQUIRED for email?
25. The subnet mask is responsible for ensuring that the _____ portion of the IPv4 network is static:

SECTION II: SELECT CORRECT OPTIONS ONLY. ALL RESPONSES ARE TO BE MARKED ON THE SCANTRON.

26. IEEE 802.3u is:
 A. 10BaseT B. 100BaseT C. 1000BaseT D. 10000BaseT E. None of these apply
27. IEEE 802.3 is:
 A. 10BaseT B. 100BaseT C. 1000BaseT D. 10000BaseT E. None of these apply
28. IEEE 802.3ae is:
 A. 10BaseT B. 100BaseT C. 1000BaseT D. 10000BaseT E. None of these apply
29. IEEE 802.3ab is:
 A. 10BaseT B. 100BaseT C. 1000BaseT D. 10000BaseT E. None of these apply

30. Which number is a broadcast for a default network?
 A. 200.200.200.224 B. 150.150.255.224 C. 10.255.255.255
 D. 200.200.200.256 E. None of these apply
31. Which protocol applies to the use of encryption?
 A. tftp B. http C. smtp D. pop3 E. https
32. For the combination shown, 24.236.71.241 and 255.255.255.0, what subnet does this host belong to?
 A. 0.0 B. 236.71 C. 236.0 D. 24.0.0.0 E. This is not a subnet problem
33. For the combination shown, 24.236.71.241 and 255.255.255.0, how many subnets and how many hosts/subnet are indicated? NOTE: **These are those numbers that can be assigned to routers, switches, servers, etc.**
 A. 256,256 B. 65536, 256 C. 255,255 D. 65534, 254 E. This is not a subnet problem
34. Firewalls open/close:
 A. protocols B. physical ports C. smtp D. pop3 E. 443
35. The primary job of a router is to _____ user traffic.
 A. route B. capture C. evaluate D. forward E. all of these are functions of a router
36. The primary job of a switch is to _____ .
 A. route B. connect common users C. fetch H2O
37. The web browser operates at what layer of the OSI Model:
 A. transport B. service C. applications
38. For which type of network does network security become a major issue?
 A. IEEE 802.3u B. LAN C. WAN D. security applies to all of these
39. If you want to use a connection between two devices with only 2 TCP/IP addresses, which set of masking bits is best:
 A. /26 B. /27 C. /28 D. /29 E. /30
40. If you are using ipconfig, you are looking for which of the following:
 A. OUI and SN B. Routing Table Info C. A neighboring host's TCP/IP address

41. The method of ensuring that a packet arrives “alive and well” is called:
 A. CRC B. FCS C. Both options are correct
42. The method of ensuring that a packet arrives “alive and well” is called: (YES, I KNOW 16 and 17 are the same... ☺)
 A. CRC B. FCS C. Both options are correct
43. The two certs that apply to the Cisco Networking Academy program at TSTC are:
 A. CCENT B. CCNA C. CCIE D. A & B Apply E. A, B, & C Apply
44. What is the purpose in Packet Tracer?
 A. Prepare for the CCNA B. Design a functional network C. Both of these apply
45. How many layers in the TCP/IP Model?
 A. 1 B. 3 C. 4 D. 7 E. What is the TCP/IP Model?
46. The TCP/IP Model application layer handles which of the following protocols?
 A. http/https B. SMTP, POP3, DHCP C. DNS D. All of these apply to this question
47. The default gateway is the _____ of the LAN.
 A. I/O B. entry/exit C. These two options are interchangeable
48. Which combination below is a valid combination of structure and default bits?
 A. NHHH/16 B. NNHH/24 C. NNNH/24 D. NNNN/32
49. If you are attempting to access a server to obtain a DHCP number, the host would be configured as a:
 A. static setup B. dynamic setup C. neither static or dynamic D. both static and dynamic
50. To identify a network, you would use which octet in IPv4?
 A. 1st B. 2nd C. 3rd D. 4th

SCANTRON SIDE 2: QUESTIONS 51-1 – 100-50.
NOTE...SIDE 2 OF THE SCANTRON WILL REPEAT THE NUMBERS 1 – 50.

SECTION III: NETWORKING AND SUBNETS. ALL RESPONSES ARE TO BE MARKED ON THE SCANTRON.

THIS SECTION HAS 5 ITEMS EACH WITH 5 QUESTIONS IN EACH SECTION. FOR EXAMPLE, ITEM 1 (Q51-Q55) WILL GIVE YOU A NETWORK NUMBER AND ASK YOU FIVE QUESTIONS IN A MATCHING FORMAT. YOU WILL LOOK AT COLUMN A AND MATCH COLUMN B TO COLUMN A AND MARK THE RESPONSE ON THE SCANTRON WITH EITHER A, B, C, D, OR E. THEN GO GO ITEM 2 (Q56-Q60), ITEM 3 (Q61-Q65), ITEM 4 (Q66-Q70), AND ITEM 5 (Q71-Q75).

ITEM 1: You are given the following: 200.200.200.0/24. Match Column B to Column A and mark the response on the Scantron.

<u>COLUMN A</u>	<u>COLUMN B</u>
51-1. Subnet Mask	A. 200.200.200.255
52-2. First useable address	B. 200.200.200.254
53-3. Last useable address	C. 200.200.200.1
54-4. Range of useable numbers	D. 255.255.255.0
55-5. Broadcast	E. 200.200.200.1 – 200.200.200.254

ITEM 2: You are given the following: 200.200.200.0/27. Match Column B to Column A and mark the response on the Scantron.

<u>COLUMN A</u>	<u>COLUMN B</u>
56-6. Subnet Mask	A. 255.255.255.224
57-7. First useable address of a subnet	B. 200.200.200.222
58-8. Last useable address of a subnet	C. 200.200.200.1
59-9. Range of useable numbers in a subnet	D. 200.200.200.31
60-10. Broadcast of a subnet	E. 200.200.200.193 – 200.200.200.222

ITEM 3: You are given the following: 200.200.200.0/27/30. Match Column B to Column A and mark the response on the Scantron.

<u>COLUMN A</u>	<u>COLUMN B</u>
61-11. Subnet Mask	A. 200.200.200.249
62-12. First useable address of a subnet	B. 255.255.255.252
63-13. Last useable address of a subnet	C. 200.200.200.250
64-14. Range of useable numbers of a subnet	D. 200.200.200.251
65-15. Broadcast of a subnet	E. .249-.250

ITEM 4: You are given the following: 150.150.0.0/16. Match Column B to Column A and mark the response on the Scantron.

<u>COLUMN A</u>	<u>COLUMN B</u>
66-16. Subnet Mask	A. .255.254
67-17. First useable address	B. .255.255
68-18. Last useable address	C. .0.1 – .255.254
69-19. Range of useable numbers	D. .0.1
70-20. Broadcast	E. 255.255.0.0

ITEM 5: You are given the following: 150.150.0.0/19. Match Column B to Column A and mark the response on the Scantron.

<u>COLUMN A</u>	<u>COLUMN B</u>
71-21. Subnet Mask of the network	A. 95.254
72-22. First useable address of a subnet	B. .224.0
73-23. Last useable address of s subnet	C. .32.1 - .63.254
74-24. Range of useable numbers of a subnet	D. .127.255
75-25. Broadcast of a subnet	E. 64.1

SECTION IV: SCENARIO SOLUTIONS. ALL RESPONSES ARE TO BE MARKED ON THE SCANTRON.

IN THIS SECTION, YOU ARE TO READ THE SCENARIO BEING PRESENTED. IN EACH SCENARIO, THERE ARE 5 “BLANKS” AND 5 RESPONSES PROVIDED. FILL IN THE BLANKS WITH THE SELECTIONS YOU MAKE FROM THE OPTIONS PROVIDED. EACH BLANK HAS A NUMBER IN PARENTHESIS AND THESE NUMBERS CORRESPOND TO THE SCANTRON NUMBERS.

Example:

An airplane needs (76-26) ___B___ to provide lift for the aircraft, and (77-27) ___D___ to provide thrust. The (78-28) ___C___ flies the plane, while the (79-29) ___E___ helps the captain. When landing, you surely hope the (80-30) ___A___ locks in place for a landing.

- A. landing gear B. wings C. pilot D. engines E. Co-pilot**
-
-

SCENARIO I: General Meeting of the IT Department, 7 December 2011, Conference Room.

Good morning everyone. Last night, the (76-26) _____ server crashed and our clients could not obtain their TCP/IP's, nor could they reach the Internet as the (77-27) _____ server also went down. When I came in this morning, I checked the (78-28) _____ cables between the switch and the PC and the (79-29) _____ cables between the switch-to-switch setup. I reviewed the diagnostic log and found that several (80-30) _____ had failed to handshake, which is what brought down the communications. Any ideas on how to prevent this in the future?

- A. patch B. DHCP C. protocols D. DNS E. crossover**
-
-

SCENARIO II: Networking Conference, Kansas City, MO. First Workshop you are attending: Port Analysis, 10:00AM – 11:30AM.

How’s everyone doing today? Good. Today, we will be discussing port analysis. For example, when the email server can’t be reached, you should check ports (81-31) _____ and (82-32) _____. If that process is validated, the next ports to be checked to ensure that your clients can access a valid TCP/IP from the pool of numbers on the server are (83-33) _____ for IPv4 and (84-34) _____ for IPv6. Once you have validated the problem, you should log into the secure web server database and log the findings using port (85-35) _____.

A. 67/68

B. 110

C. 25

D. 546/547

E. 443

=====

SCENARIO III: Networking Conference, Kansas City, MO. Second Workshop you are attending: OSI Model, 1:00PM – 2:30PM.

How’s everyone doing this afternoon? I’ll keep this lively as we have just returned from lunch. Okay, let’s get to it. I want to walk through some of the features of the OSI Model, of which you are familiar. However, I want to do a bit of application today. For example, when you click the “little fox” for your Firefox browser, you are using the (86-36) _____ layer, right? Then, if you are sending a packet that is to be read by a MAC on the receiving end of your send, you will need the services of the (87-37) _____ layer. Once you are ready for the packet to find its “best path” through the Internet, you’ll need the (88-38) _____ layer for that to be accomplished. Finally, if there is a MAC address problem, the (89-39) _____ layer will handle issue, while the signals will be placed on the media by the (90-40) _____ layer.

A. Data Link

B. Presentation

C. Application

D. Physical

E. Network

=====

SCENARIO IV: Help Desk, Network Configuration, Problem-Xk74.5; Buffalo Rock Corporation, Irving, Montana: Salary, \$56,500/Annually

INCOMING CALL...the voice you hear is the caller first, then your directions...

CALLER: Hello, is this tech support? Well, I can't seem to figure out how to make my SOHO (Small Office, Home Office) network work? I have purchased some equipment, like a Cisco 2621XM router, a 2950-T Switch, a server, and some cables. Can you help me connect them and test them? Yes!? Thanks. Okay, what do I do...

TECH SUPPORT: First, let's connect the PC to the router. You will need to be able to setup the router and this is done by connecting the (91-41) _____ port on the PC to the (92-42) _____ port on the router. Next, you will need to setup the PC as a static configured machine so that we can test the network connections: Microsoft requires a specific order to the PC Network configuration so we will set the (93-43) _____ first, the (94-44) _____ second, and finally we will set the (95-45) _____.this conversation continues until the call is completed.

- A. Default Gateway B. USB C. Subnet Mask D. console E. IP Address**

=====

GO TO NEXT PAGE.

SCENARIO V: IT Systems Engineer Meeting, Buffalo Rock Corporation, Irving, Montana: Salary, \$72,500/Annually (You were promoted!) Morning, folks. The President wants to add a new division to the organization. We are looking to improve the bottom line and create a new high speed, web access center. I've contacted IANA for the network number, but I need you to design the network and get back to me this afternoon on the design. Here's what I need: 50 users on each IEEE 802.3u segment, with 5 servers on each segment. The network is 200.200.200.0/24. Questions? Okay, I'll see you this afternoon. ... Now, fill in the spaces to indicate your design.

I will have (96-46) _____ total subnets for this design, with a minimum required (97-47) _____ TCP/IP addresses per IEEE 802.3u segment. There will be (98-48) _____ masking bits used for the network subnets, with a total of (99-49) _____ user addresses on each segment—that is useable addresses. The subnet mask for this problem will be (100-50) _____.

- A. 2 B. 4 C. 192 D. 62 E. 56**

=====

END OF EXAM, FALL SEMESTER 2011, DPT161 NETWORKING FUNDAMENTALS

=====

I will not discuss this exam with another individual in order to support their student learning outcome advantage. I accept this consideration as part of the honor code of my college, myself, and my personal responsibility to continuous improvement in my lifelong learning endeavors.

Print Your Name Here

Sign Your Name Here