

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΕΚΠΑΙΔΕΥΣΗΣ
ΛΕΥΚΩΣΙΑ

ΠΑΓΚΥΠΡΙΕΣ
ΓΡΑΠΤΕΣ ΕΞΕΤΑΣΕΙΣ
2015
(ΓΙΑ ΑΠΟΛΥΣΗ)

Α΄ ΣΕΙΡΑ ΕΞΕΤΑΣΕΩΝ

ΜΑΘΗΜΑ : ΔΙΚΤΥΑ - CISCO

ΧΡΟΝΟΣ : 2 ώρες

ΗΜΕΡΟΜΗΝΙΑ : 17 Ιουνίου 2015

ΩΡΑ ΕΝΑΡΞΗΣ : 07:45 π.μ.

ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΔΩΔΕΚΑ (12) ΣΕΛΙΔΕΣ

Οδηγίες:

- Να απαντήσετε σε όλες τις ερωτήσεις
- Όλες οι απαντήσεις να γραφούν στο τετράδιο απαντήσεων
- Επιτρέπεται η χρήση μη προγραμματιζόμενης υπολογιστικής μηχανής

ΜΕΡΟΣ Α. (30 μονάδες)

Να απαντήσετε και στις είκοσι (20) ερωτήσεις πολλαπλής επιλογής. Η κάθε ερώτηση βαθμολογείται με 1½ μονάδα.

Ερώτηση 1. (Chapter 1) 2012β 2013β 2014β 2015α

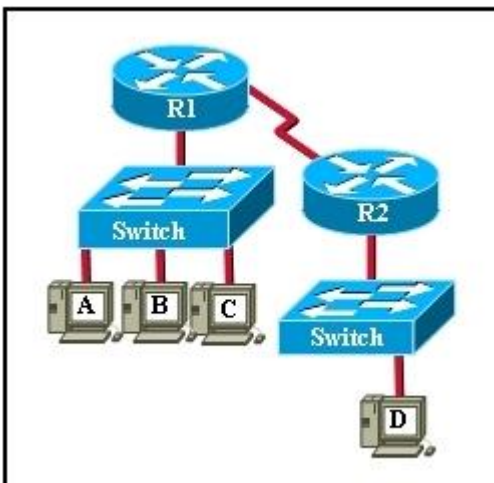
A network administrator can successfully connect to <http://www.mycompany.com>, through an Internet browser, but cannot connect to another web server located at an ISP in another city. Which tool or command would help to identify where the packet was lost or delayed?

- (a) ipconfig
- (b) ping
- (c) netstat
- (d) **tracert**
- (e) telnet

Ερώτηση 2. (Chapter 2) 2014β 2015α

Which scenario represents a problem at Layer 4 of the OSI model?

- (a) An incorrect IP address on the default gateway.
- (b) **A firewall filtering traffic addressed to TCP port 25 on an email server.**
- (c) A bad subnet mask in the host IP configuration.
- (d) An incorrect DNS server addresses being given out by DHCP.

Ερώτηση 3. (Chapter 2) 2015α

Refer to the exhibit. The switches are in their default configuration. Host A needs to communicate with host D, but host A does not have the MAC address for its default gateway. Which network hosts will receive the ARP request sent by host A?

- (a) only host D
- (b) only router R1
- (c) only hosts A, B, and C
- (d) only hosts A, B, C, and D
- (e) only hosts B and C
- (f) **only hosts B, C, and router R1**

Ερώτηση 4. (Chapter 2) 2015α

Which is one of the functions of the transport layer of the OSI model?

- (a) routes data between networks
- (b) converts data to bits for transmission
- (c) delivers data reliably across the network using TCP
- (d) transmits data to the next directly connected device

Ερώτηση 5. (Chapter 3) 2014β 2015α

Which of the following is included in the physical network topology diagram?

- (a) IP configuration of all hosts
- (b) Host names
- (c) Amount of data transferred on each network
- (d) Location of NAT service
- (e) Location of wiring closet

Ερώτηση 6. (Chapter 4) 2012 2013β 2014β 2015α

How many network devices can be accommodated in a network which has a host with IP address 192.168.1.128/26?

- (a) 30
- (b) 32
- (c) 62
- (d) 64

Ερώτηση 7. (Chapter 4) 2014β 2015α

What must happen for a privately addressed host on an inside local network to be able to communicate with an outside destination host on the Internet?

- (a) The host IP address must be translated to an inside global address.
- (b) The host IP address must be translated to an outside local address.
- (c) The host IP address must be translated to an inside local address.
- (d) The host IP address must be translated to an outside global address.

Ερώτηση 8. (Chapter 5) 2013β 2014β 2015α

Which of the following is true about the router's flash memory?

- (a) It stores a router's configuration file
- (b) It maintains the image of the operating system
- (c) It maintains the POST software
- (d) It maintains the bootstrap programme
- (e) It stores the running configuration of the router
- (f) It stores the routing table

Ερώτηση 9. (Chapter 5) 2015α

What is the purpose of using the copy tftp flash command on a router?

- (a) to back up the IOS image to a server
- (b) to back up the router configuration to a server
- (c) to restore the IOS image from a server
- (d) to restore the router configuration from a server

Ερώτηση 10. (Chapter 6) 2012β 2013β 2014β 2015α

What is the purpose of the routing process?

- (a) Encapsulate data that is used to communicate across a network
- (b) To provide secure Internet file transfer
- (c) To convert a URL name into an IP address
- (d) To select the paths that are used to direct traffic to destination networks
- (e) To forward traffic on the basis of MAC address

Ερώτηση 11. (Chapter 6) 2014β 2015α

Which part of an IP packet does the router use to make routing decisions?

- (a) source IP address
- (b) destination IP address
- (c) source MAC address
- (d) destination MAC address

Ερώτηση 12. (Chapter 7) 2014β 2015α

Which application layer protocol uses UDP as its transport protocol?

- (a) TFTP
- (b) FTP
- (c) HTTP
- (d) SMTP

Ερώτηση 13. (Chapter 7) 2012β 2013β 2014β 2015α

A client is communicating with a server. How does the server determine what service is being requested by the client?

- (a) applies the default service configured in directory services
- (b) uses ARP to discover the appropriate service from the local router
- (c) sends a request to the client asking for the appropriate service
- (d) identifies the appropriate service from the destination port field

Ερώτηση 14. (Chapter 7) 2015α

What is one purpose of the TCP three-way handshake?

- (a) sending echo requests from the source to the destination host to establish the presence of the destination
- (b) determining the IP address of the destination host in preparation for data transfer
- (c) synchronizing sequence numbers between source and destination in preparation for data transfer
- (d) requesting the destination to transfer a binary file to the source

Ερώτηση 15. (Chapter 8) 2015α

Which benefit does SSH offer over Telnet when remotely managing a router?

- (a) encryption
- (b) TCP usage
- (c) authorization
- (d) connection using six VTY lines

Ερώτηση 16. (Chapter 8) 2015α

What is the term used to describe the area of a network which stores servers that are accessible to any users from the Internet?

- (a) "clean" LAN
- (b) intranet
- (c) DMZ
- (d) extranet

Ερώτηση 17. (Chapter 9) 2014β 2015α

A user can access any web page on the Internet but cannot access e-mail. What troubleshooting method would be most efficient for troubleshooting this issue?

- (a) top-down
- (b) bottom-up
- (c) divide-and-conquer
- (d) impossible to determine from this information

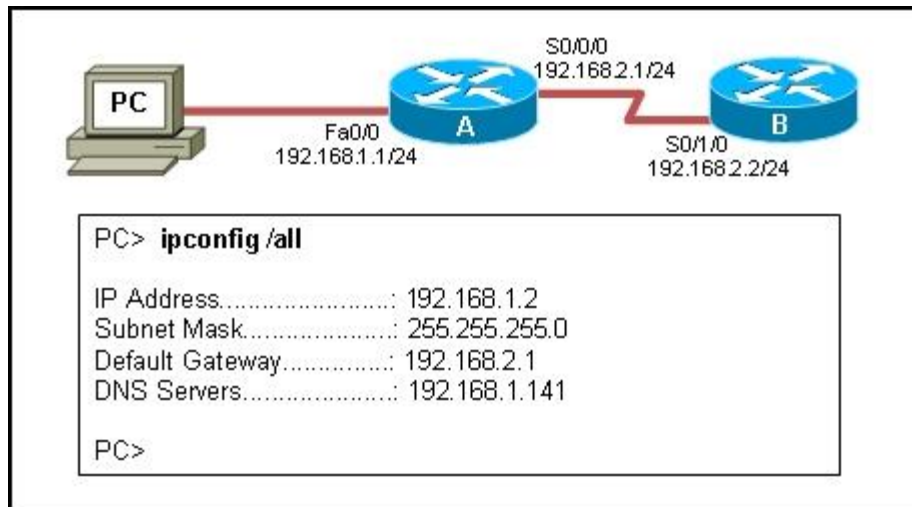
Ερώτηση 18. (Chapter 7,8,9) 2015α

To be able to access a class on www.netacad.com a student needs to sign in using a screen name and a password. Which protocol should be used?

- (a) HTTPS
- (b) HTTP
- (c) FTP
- (d) DNS

Ερώτηση 19. (Chapter 9) 2015α

Refer to the exhibit. The PC is trying to ping router B at 192.168.2.2, but it fails. What is the problem?



- (a) The PC is on the wrong subnet.
- (b) The default gateway on the PC should be 192.168.1.1.
- (c) The default gateway should be 192.168.2.2.
- (d) The DNS server is incorrect.
- (e) The IP address for Fa0/0 on router A is incorrect.

Ερώτηση 20. (Chapter 9) 2015α

An ISP help desk technician receives a call from a customer who reports that no one at their business can reach any websites or get their e-mail. After testing the communication line and finding everything fine, the technician instructs the customer to run nslookup from the command prompt. What does the technician suspect is causing the customer's problem?

- (a) improper IP address configuration on the host
- (b) hardware failure of the ISR used to connect the customer to the ISP
- (c) bad cables or connections at the customer site
- (d) failure of DNS to resolve names to IP addresses

Μέρος Β (30 μονάδες)

Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με έξι (6) μονάδες.

Ερώτηση 1. (Chapter 6) 2013β 2014β 2015

(1 pt for each statement)

A network administrator has issued the command **show ip route** on a router. One of the lines in the output is the following:

R 192.168.50.0/24 [120/3] via 192.168.10.1, 00:00:21, Serial0/0/1

Fill in the blanks in the following statements:

- (a) This route was set up using the RIP routing protocol.
- (b) The value 120 is called the administrative distance.
- (c) This route tells the router where to forward packets for network 192.168.50.0/24.
- (d) The **next hop** interface address is 192.168.10.1.
- (e) A packet sent via this route will have to pass through another 3 routers before reaching the destination network.
- (f) The next update for this route is expected in 9 seconds.

Ερώτηση 2. (Chapter 4,7,8) 2014β 2015

(1 pt for each statement)

Fill in the blanks in the following statements:

- (a) IP addressing and routing are associated with the network layer.
- (b) The application-layer service destination for an IP packet arriving at a server addressed to TCP port 21 is FTP.
- (c) UDP is a layer 4 protocol that does not require acknowledgements.
- (d) A router does not forward broadcasts.
- (e) The TCP layer 4 protocol retransmits lost data.
- (f) An e-mail client connection downloads all messages and then deletes them from the e-mail server. The type of client connection that does this is POP3.

Ερώτηση 3. (Chapter 6) 2014β 2015

State whether the statements on the following table are true or false. (1 pt for each answer)

A/A	Statement	Answer (true or false)
(a)	Within an autonomous system, networks are under a single administration	true
(b)	Exterior gateway protocols are designed to exchange routing information within the same autonomous system	false
(c)	Dynamic routing does not require the use of routing protocols to exchange route information between routers.	false
(d)	Link state protocols reduce routing loops and network traffic.	true
(e)	IGP examples include RIP and EIGRP.	true
(f)	The command show ip route checks to see that the interfaces are up and operational.	false

Ερώτηση 4. (Chapter 5) 2013β 2014β 2015

(1pt for each answer)

In the following table write the show command that will display what is explained in the "Description" column.

A/A	Description	Show command
(a)	Displays status and statistics for all interfaces on the router	show interfaces
(b)	Display version information for the hardware and firmware	show version
(c)	Shows the configuration stored in NVRAM	show startup-config
(d)	Displays the IP routing table	show ip route
(e)	Shows the previously executed commands (last 10)	show history
(f)	Displays information about directly connected neighbors	show cdp neighbor

Ερώτηση 5. (Chapter 9) 2013β 2014β 2015α

Identify the characteristics and protocols of TCP and UDP. Write next to each characteristic the appropriate protocol. (1 pt for each answer)

	Characteristics	Protocol
(a)	Connectionless	UDP
(b)	Three-way Handshake	TCP
(c)	HTTP	TCP
(d)	Less Overhead	UDP
(e)	No Acknowledgement	UDP
(f)	Reliable Transport Protocol	TCP

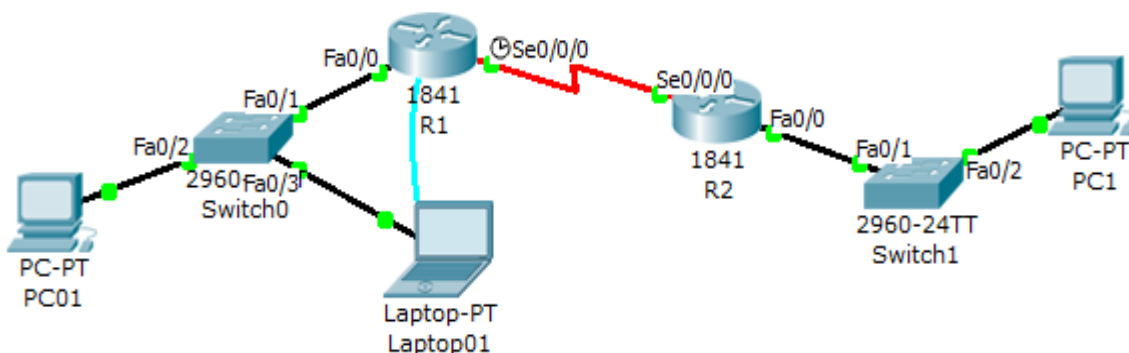
ΜΕΡΟΣ Γ (24 Μονάδες)

Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με οκτώ (8) μονάδες.

Ερώτηση 1. (Chapter 5, 6) 2014β 2015

Answer the following questions based on the table and network diagram listed below.

Router	Interface	IP Address
R1	Fa0/0	10.10.10.3/26
	S0/0/0	10.10.10.65/26
R2	Fa0/0	10.10.10.129/26
	S0/0/0	10.10.10.66/26



- (a) Give the necessary commands for changing the host name of router R1 to CYRouter. Assume that the router is initially in user mode. (4 pts)

R1> **enable** (1 pt)

R1# **configure terminal** (1pt)

R1(config)# **hostname CYRouter** (2pt)

CYRouter(config)#

- (b) Give the necessary commands for configuring a static route on router CYRouter for network 10.10.10.128/26. Assume that the router is initially in privileged mode. (4 pts)

CYRouter# **configure terminal** (1 pt)

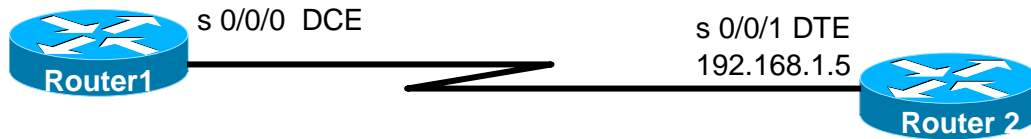
CYRouter(config)# **ip route 10.10.10.128 255.255.255.192 10.10.10.66** (2pt)

CYRouter(config)# **exit** (1pt)

CYRouter#

Ερώτηση 2. (Chapter 5) 2014β 2015

Consider the following network diagram:



- (a) Give the necessary commands for configuring and activating the serial interface S0/0/0 of Router1 (IP 192.168.1.4). Assume that the router is initially in privileged mode. (5 pts)

Router1# configure terminal (1 pt)
Router1(config)# interface serial 0/0/0 (1pt)
Router1(config-if)# ip address 192.168.1.4 255.255.255.0 or any valid (1pt)
Router1(config-if)# clock rate 64000 (1pt)
Router1(config-if)# no shutdown (1pt)
Router1(config)# exit (δεν είναι απαραίτητο)

- (b) Give the necessary command on Router1 to configure a default route to send packets to Router2. Assume that the router is in global configuration mode. (1 pt)

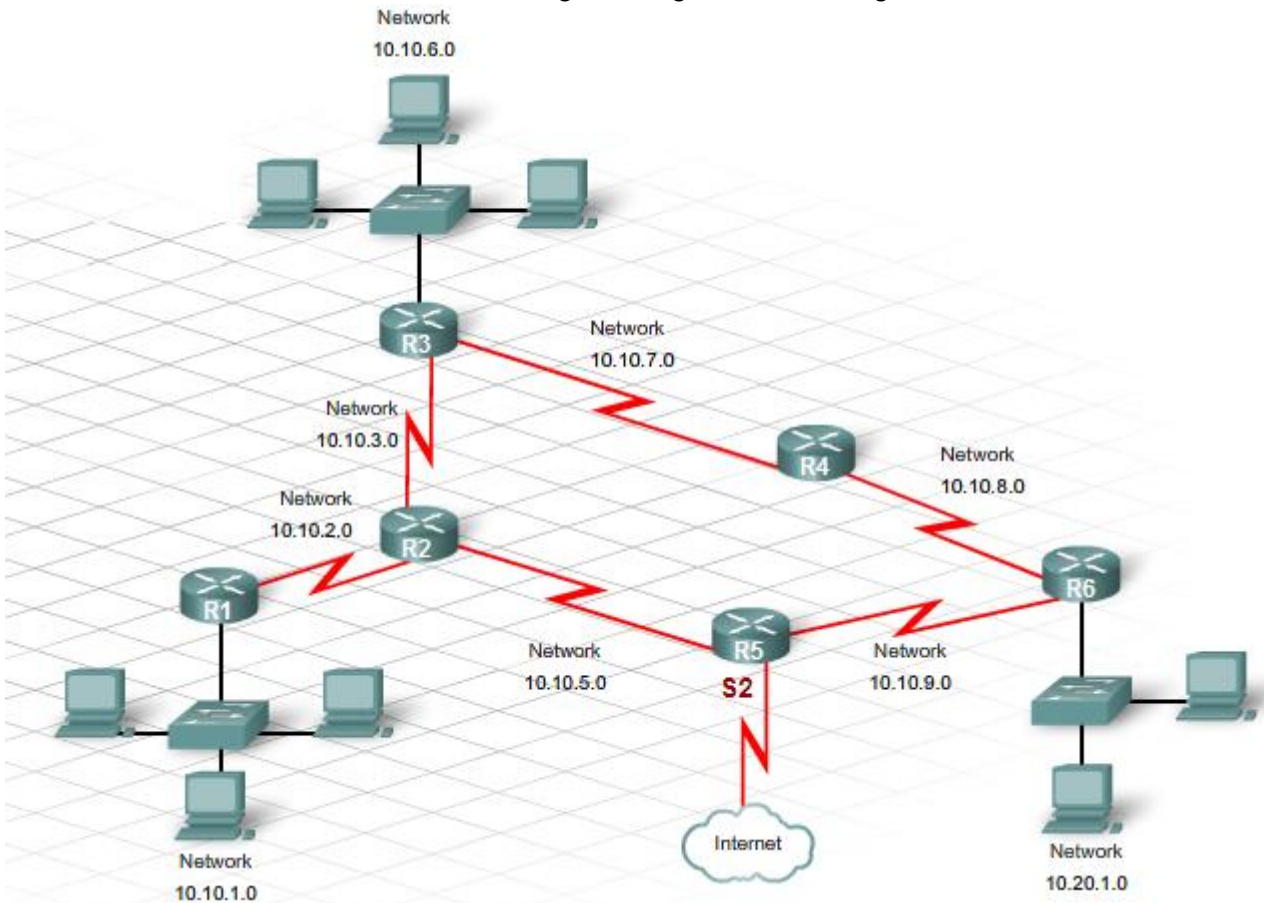
Router1(config)# ip route 0.0.0.0 0.0.0.0 S0/0/0 or 192.168.1.5 (1pt)

- (c) Give the necessary command to configure the word CISCO as the password to access the console port. Assume that the router is in global configuration mode. (2 pts)

Router(config)# line con 0 (0,5 pt)
Router(config-line)# password CISCO (1 pt)
Router(config-line)# login (0,5 pt)

Ερώτηση 3. (Chapter 6) 2014β 2015α

It has been decided to use RIP v.2 to manage routing in the following network.



- (a) Give the necessary commands to enable and configure RIP v.2 on **router R2**. Assume that the router is initially in privileged mode and that all interfaces of router R2 are configured with the IP addresses shown in the diagram. (3 pts)

R2# **configure terminal** (0.5pt)

R2(config)# **router rip** (0.5pt)

R2(config-router)# **version 2** (0.5pt)

R2(config-router)# **network 10.10.2.0** (0.5 pt) ή **network 10.0.0.0** (για όλα μαζί)

R2(config-router)# **network 10.10.3.0** (0.5 pt)

R2(config-router)# **network 10.10.5.0** (0.5 pt)

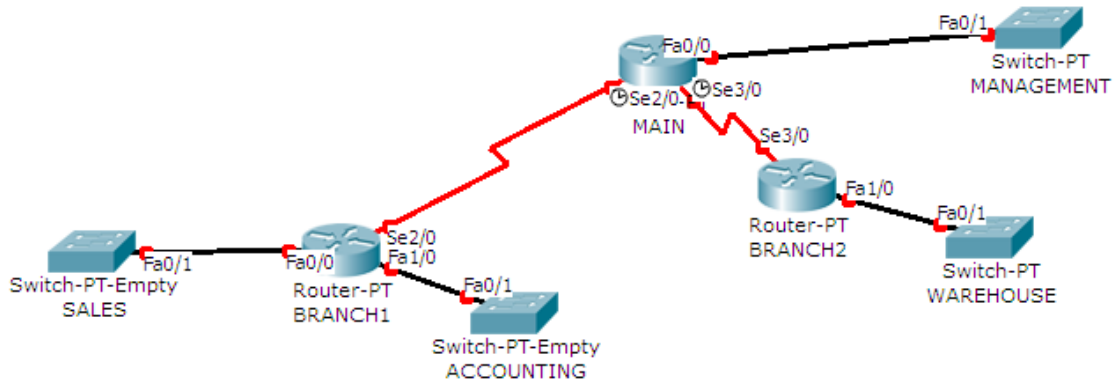
- (b) Show the complete routing table for **router R3**. Assume that all routers are correctly configured and that there is a default route towards the Internet. (5 pts)

Destination Network	Next Hop Router	Number of Hops
10.10.6.0	Directly connected	0
10.10.3.0	Directly connected	0
10.10.7.0	Directly connected	0
10.10.2.0	R2	1
10.10.1.0	R2	2
10.10.8.0	R4	1
10.20.1.0	R4	2
10.10.5.0	R2	2
10.10.9.0	R2/R4	2
Internet/0.0.0.0	R2	2

ΜΕΡΟΣ Δ (16 Μονάδες)

Να απαντήσετε στην πιο κάτω ερώτηση.

2014β 2015α



Consider the above network diagram. A company is given the network address 200.10.10.0/24 and needs to create subnets in order to configure all subnets shown in the diagram. Each subnet should support at least 15 hosts. Answer the following questions:

- (a) How many bits have been borrowed from the host part to create these subnets? 3 (2 pts)
- (b) What is the subnet mask for these subnets? 255.255.255.224 (1 pt)
- (c) How many hosts can we have on each subnet? 30 usable (1 pt)
- (d) The first available subnet (subnet 0) is given to the management network. What is the default gateway for the hosts of this network given that the interface is assigned the last usable address of the subnet? 200.10.10.30 (2 pts)
- (e) The second available subnet (subnet 1) is used for the connection between the Main and the Branch1. Given that the interfaces are assigned the 1st and the 2nd usable addresses, write below these 2 addresses. 200.10.10.33 – 200.10.10.34 (2 pts)
- (f) Sales is given the third available subnet. What is the network address for this subnet? 200.10.10.64 (2 pts)
- (g) Accounting is given the fourth available subnet. What is the subnet’s broadcast address? 200.10.10.127 (2 pts)
- (h) Warehouse is given the sixth available subnet. What are the assignable addresses for this subnet? 200.10.10.161–200.10.10.190 (2 pts)
- (i) What are the assignable addresses of the LAST available subnet? 200.10.10.225–200.10.10.254 (2 pts)

ΤΕΛΟΣ ΕΞΕΤΑΣΗΣ