

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΕΚΠΑΙΔΕΥΣΗΣ
ΛΕΥΚΩΣΙΑ

ΠΑΓΚΥΠΡΙΕΣ
ΓΡΑΠΤΕΣ ΕΞΕΤΑΣΕΙΣ
2014
(ΓΙΑ ΑΠΟΛΥΣΗ)

Α΄ ΣΕΙΡΑ ΕΞΕΤΑΣΕΩΝ

ΜΑΘΗΜΑ : ΔΙΚΤΥΑ - CISCO

ΧΡΟΝΟΣ : 2 ώρες

ΗΜΕΡΟΜΗΝΙΑ : 17 Ιουνίου 2014

ΩΡΑ ΕΝΑΡΞΗΣ : 07:45 π.μ.

ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΕΝΔΕΚΑ (11) 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 1 ½ μονάδα.

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

Which of the following types of connections is considered high bandwidth connection and it is used by businesses?

- (a) Dialup access
- (b) T3
- (c) Satellite
- (d) Cable modem

Ερώτηση 2. (Chapter 1) 2014α

What makes it possible for email to be sent and received on any device (desktop, laptop, smartphone, tablet)?

- (a) All devices use the same operating system
- (b) All devices run the same email client software
- (c) There is a single provider of email software
- (d) All email software is using the same standards and protocols

Ερώτηση 3. (Chapter 2) 2014α

What is the correct encapsulation order when data is passed from Layer 1 up to Layer 4 of the OSI model?

- (a) bits, frames, packets, segments
- (b) frames, bits, packets, segments
- (c) packets, frames, bits, segments
- (d) segments, frames, bits, packets

Ερώτηση 4. (Chapter 2) 2014α

What should be done after an ISP helpdesk technician resolves a customer problem?

- (a) Delete the trouble ticket from the database
- (b) Document the solution in the trouble ticket
- (c) Escalate the trouble ticket to level 2 engineers
- (d) Issue a work order for customer notification

Ερώτηση 5. (Chapter 3) 2014α

Why is it important to have a floor plan of the premises when planning a network upgrade?

- (a) To design layer 3 addressing
- (b) To avoid areas with electrical wiring
- (c) To identify possible wiring closet locations
- (d) To decide the number of broadcast domains needed

Ερώτηση 6. (Chapter 4) 2014α

A school uses the network address 192.168.30.0 with a subnet mask of 255.255.255.240 to create subnets. What is the maximum number of useable IP addresses per subnet?

- (a) 6
- (b) 14
- (c) 30
- (d) 62
- (e) 240

Ερώτηση 7. (Chapter 4) 2014α

Which of the following addresses can be assigned to a host in the network 192.168.1.0/25?

- (a) 192.168.1.250
- (b) 192.168.1.128
- (c) 192.168.1.127
- (d) 192.168.1.30

Ερώτηση 8. (Chapter 4) 2014α

Which statement accurately describes public IP addresses?

- (a) Public addresses can be duplicated only within a local network.
- (b) Public addresses cannot be used within a private network.
- (c) Public IP addresses must be unique across the entire Internet.
- (d) Network administrators are free to select any public addresses to use for network devices that access the Internet.

Ερώτηση 9. (Chapter 5) 2014α

What kind of memory is not typically available in a router?

- (a) RAM
- (b) Hard Disk
- (c) ROM
- (d) NVRAM

Ερώτηση 10. (Chapter 5) 2013β 2014α

A network administrator needs to perform an initial router configuration. Which of the following connection methods will the administrator use?

- (a) Console
- (b) AUX
- (c) Telnet
- (d) In-band

Ερώτηση 11. (Chapter 6) 2012β 2013β 2014α

Consider this routing table entry:

```
R 172.16.1.0/24 [120/1] via 200.1.1.1 00:00:27 Serial0/1
```

What type of route is this?

- (a) a static route
- (b) a default route
- (c) a RIP route
- (d) an OSPF route
- (e) an EIGRP route
- (f) a directly-connected route

Ερώτηση 12. (Chapter 6) 2014α

What information is included in RIPv2 routing updates that is not included in RIPv1 updates?

- (a) Metric
- (b) subnet mask
- (c) area identification
- (d) hop count
- (e) autonomous system number

Ερώτηση 13. (Chapter 6) 2012β 2013β 2014α

Which protocol is described as a simple distance vector interior routing protocol?

- (a) **RIP v2**
- (b) BGP
- (c) EIGRP
- (d) OSPF

Ερώτηση 14. (Chapter 6), 2014α

Which of the following **is not** an interior routing protocol?

- (a) RIP v2
- (b) OSPF
- (c) EIGRP
- (d) **BGP**

Ερώτηση 15. (Chapter 7) 2012β 2013β 2014α

What DNS zone resolves domain names to IP addresses?

- (a) Dynamic lookup
- (b) **Forward lookup**
- (c) Resource record
- (d) Reverse lookup

Ερώτηση 16. (Chapter 7) 2013β 2014α

Which application-layer protocol does **NOT** use UDP as the transport protocol?

- (a) DNS
- (b) SNMP
- (c) **HTTP**
- (d) TFTP

Ερώτηση 17. (Chapter 8) 2012β 2013β 2014α

Which benefit does HTTPS offer over HTTP when accessing a remote web server?

- (a) **encryption**
- (b) TCP usage
- (c) higher speed
- (d) connection using six VTY lines

Ερώτηση 18. (Chapter 8) 2014α

What is the term used to describe the area of a network where servers are connected to be accessible to any user from the Internet?

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

Ερώτηση 19. (Chapter 9) 2014α

Which command would help **the least** in troubleshooting a failed WAN connection?

- (a) **nslookup**
- (b) ping
- (c) tracert
- (d) ipconfig

Ερώτηση 20. (Chapter 9) 2012β 2014α

A network administrator has received a phone call from an employee who complains with the general statement "I cannot access the Internet". The experienced administrator, since he knows that there are no general problems with the internet, applies the following troubleshooting technique:

- 1) He asks the employee if he can access his email (no problem)
- 2) He checks if he can access different sites on the Internet by using Internet Explorer (unsuccessful)
- 3) He installs a different internet browser and tries to connect to the same sites on the Internet (successful).

Which technique the administrator applied to identify the problem?

- (a) Bottom-Up
- (b) Divide-and-Conquer
- (c) Top-Down
- (d) Substitution

Μέρος Β (30 μονάδες)
 Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με έξι (6) μονάδες.

Ερώτηση 1. (Chapter 1,2, 5, 7) 2014α

(1 pt for each statement)

Fill in the blanks in the following statements:

- (a) A protocol is a set of rules that computer network devices follow when transmitting and receiving data.
- (b) Regardless of the type of device that an individual or business uses to connect to the Internet, the device must connect through an Internet Service Provider.
- (c) Bandwidth is measured in bits per second (bps).
- (d) In a wired network, the physical topology map shows the exact location of the wiring closet and the wiring to the individual end-user stations
- (e) One of the advantages of using NAT is that individual hosts are not directly accessible from the (public) Internet.
- (f) UDP is often referred to as an unreliable delivery protocol because there is no guarantee that a message has been received by the destination host.

Ερώτηση 2. (Chapter 2) 2012β 2013β 2014α

Correspond each protocol or technology to the layer it belongs to. (0.5 pts each answer)

TCP, Switch, Hub, Radio Waves, UDP, IMAP4, Port Number, Routing, IP Address, MAC Address, FTP, Frame.

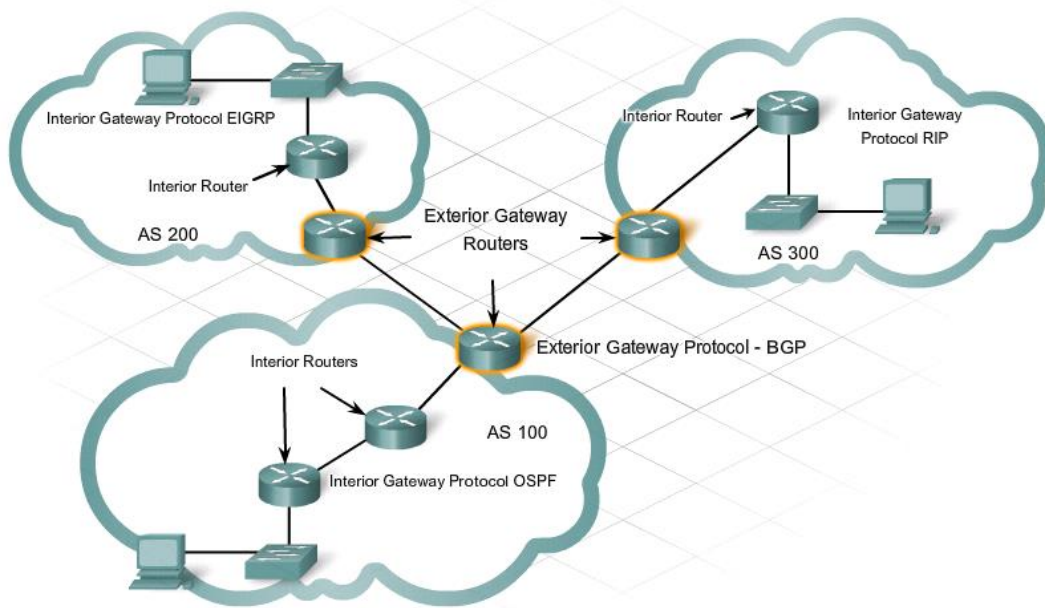
Physical Layer	Data Link Layer	Network Layer	Transport Layer	Upper Layers
Hub Radio Waves	Switch MAC Address Frame	Routing IP Address	TCP UDP Port Number	IMAP4 FTP

Ερώτηση 3. (Chapter 6) 2012β 2013β 2014α

Write each protocol listed in the table on the left to its proper table category on the right. Note that one category may have more protocols than the other. (1 pt for each answer)

Protocols	Routed Protocols	Routing Protocols
EIGRP	IP	EIGRP
IP	AppleTalk	BGP
BGP		RIP
RIP		OSPF
AppleTalk		
OSPF		

Ερώτηση 4. (Chapter 6) 2014α



Based on the above diagram answer the following questions:

- (a) How many autonomous systems are there? **3**
- (b) How many routers should use at least 2 routing protocols **3**
- (c) Name the protocol(s) used inside the autonomous systems. **OSPF, RIP, EIGRP**
- (d) Name the protocol(s) used outside the autonomous systems. **BGP**

Ερώτηση 5. (Chapter 5) 2014α

Match each term (a)-(f) with the mode prompt that best describes it (1)-(6). Write in your answer book the letter (a)-(f) of each description, together with the number (1)-(8) of the prompt corresponding to the correct description. Two of the terms have no description and should not be used.

Correspond each of the explanations listed in the following table to the appropriate mode. (1 pt for each answer)

Mode prompt
(1) Router(config)#
(2) Router>
(3) Router#
(4) Router(config-if)#
(5) Router(config-router)#
(6) Router(config-mode)#
(7) Router(privileged)>
(8) Router(config-line)#

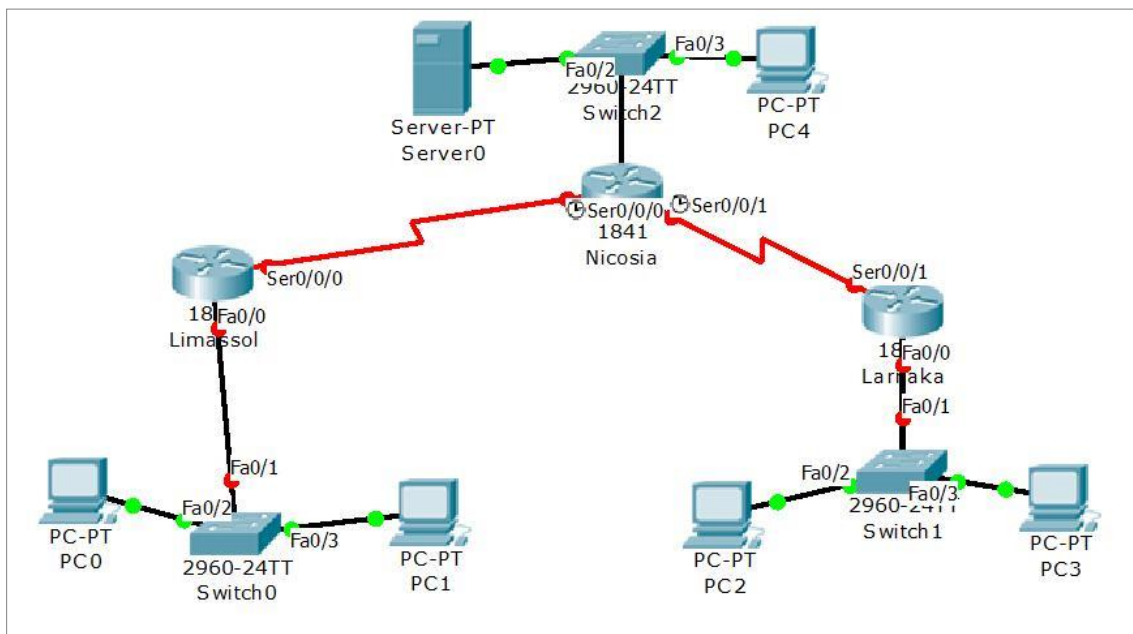
A/A	Description	answer
(a)	User EXEC mode.	2
(b)	Privileged EXEC mode.	3
(c)	Configuration mode.	1
(d)	Interface level within configuration mode.	4
(e)	Line level (vty, tty, async) within configuration mode.	8
(f)	Routing engine level within configuration mode.	5

ΜΕΡΟΣ Γ (24 Μονάδες)

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

Ερώτηση 1. (Chapter 6) 2012β 2013β 2014α

In the network shown below, configure static routing on all routers, so that all hosts can communicate with each other. Assume that all other necessary router configurations have been done correctly. You only need to specify static routing configuration commands for each router. In your answer, you must make clear which commands correspond to which router.



Router	Interface	IP Address	Subnet mask
Nicosia	Fa0/0	192.168.1.1	255.255.255.0
	S0/0/0	192.168.20.1	255.255.255.0
	S0/0/1	192.168.30.1	255.255.255.0
Limassol	S0/0/0	192.168.20.2	255.255.255.0
	Fa0/0	192.168.2.1	255.255.255.0
Larnaca	S0/0/1	192.168.30.2	255.255.255.0
	Fa0/0	192.168.3.1	255.255.255.0

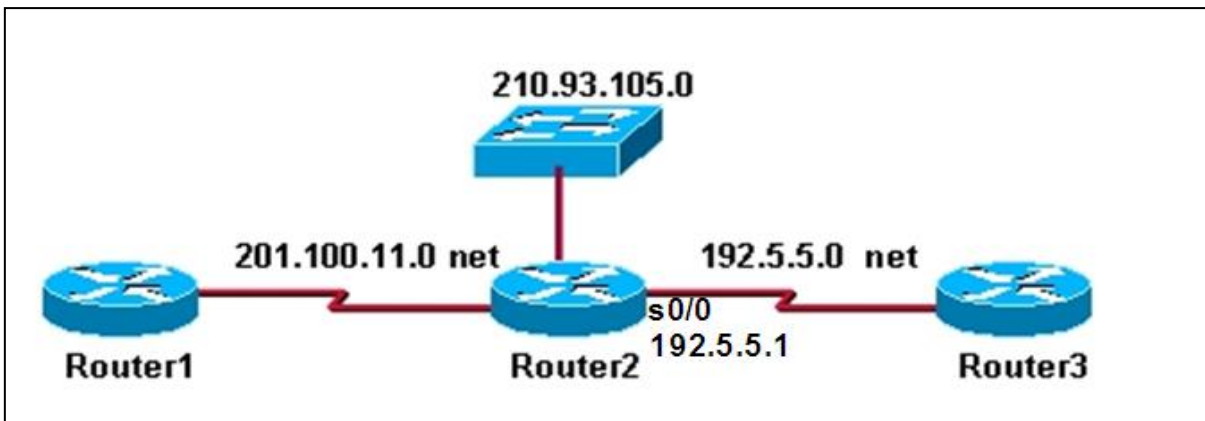
```
Nicosia(config)# ip route 192.168.2.0 255.255.255.0 192.168.20.2
Nicosia(config)# ip route 192.168.3.0 255.255.255.0 192.168.30.2
```

```
Limassol(config)# ip route 192.168.1.0 255.255.255.0 192.168.20.1
Limassol(config)# ip route 192.168.3.0 255.255.255.0 192.168.20.1
Limassol(config)# ip route 192.168.30.0 255.255.255.0 192.168.20.1
H
Limassol(config)# ip route 0.0.0.0 0.0.0.0 192.168.20.1
```

```
Larnaca(config)# ip route 192.168.1.0 255.255.255.0 192.168.30.1
Larnaca(config)# ip route 192.168.2.0 255.255.255.0 192.168.30.1
Larnaca(config)# ip route 192.168.20.0 255.255.255.0 192.168.30.1
H
Larnaca(config)# ip route 0.0.0.0 0.0.0.0 192.168.30.1
```


Ερώτηση 2. (Chapter 5) 2014α

Answer the following questions based on the network below:



- (a) Give the necessary commands for configuring and activating the serial interface S0/0 of router2 (192.5.5.1). Assume that the router is initially in privileged mode.

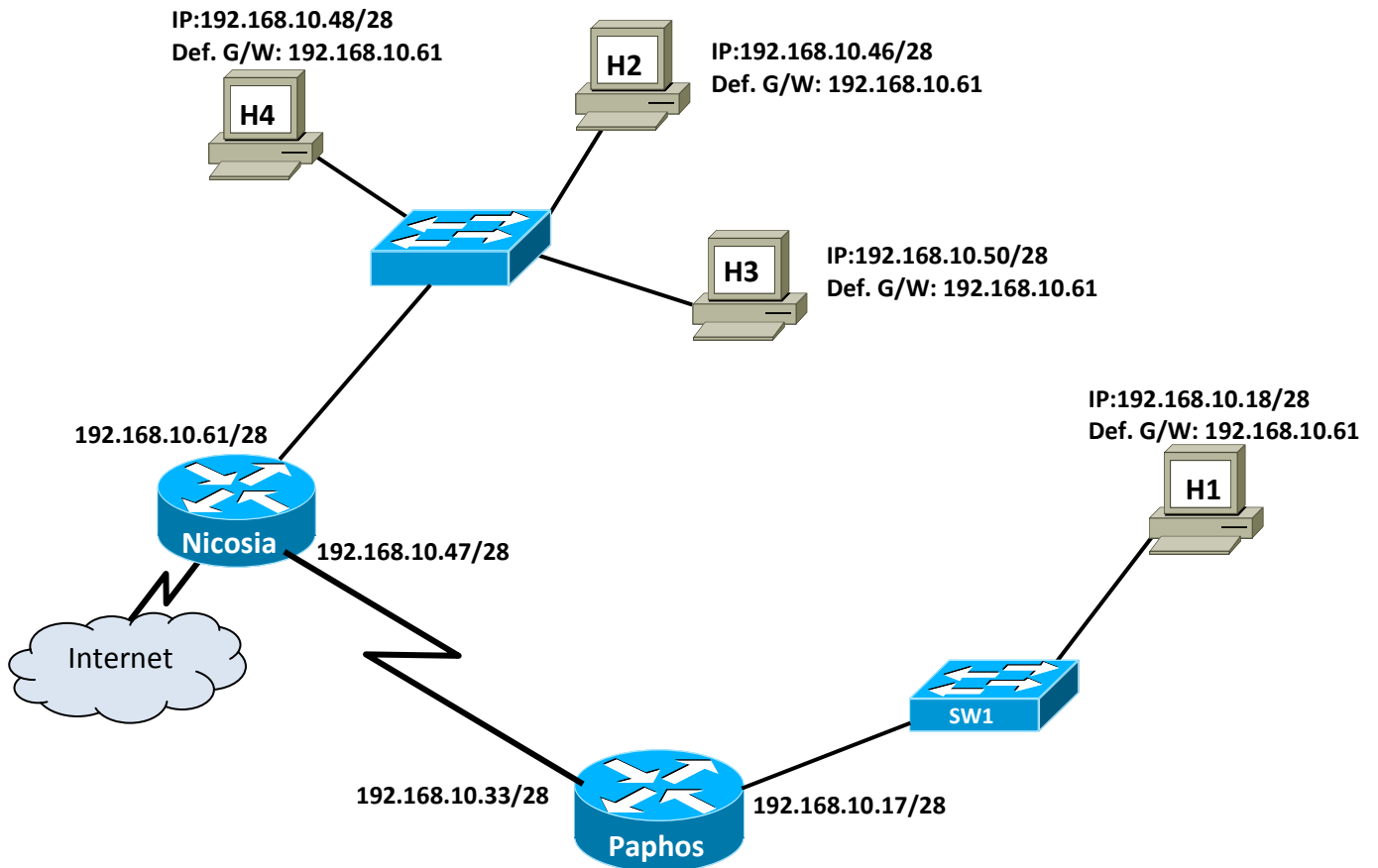
```
Router# configure terminal (1 pt)
Router(config)# interface serial 0/0 (1pt)
Router(config-if)# ip address 192.5.5.1 255.255.255.0 (1pt)
Router(config-if)# no shutdown (1pt)
Router(config)# exit (δεν είναι απαραίτητο)
Router#
```

- (b) The routers shown in the graphic receive routing updates every 30 seconds by default. Write the commands that when configured on Router2 will enable routing and achieve this update interval.

```
Router2#
Router2(config)# router rip (1pt)
Router2(config-router)# network 192.5.5.0 (1pt)
Router2(config-router)# network 201.100.11.0 (1pt)
Router2(config-router)# network 210.93.105.0 (1pt)
```

Ερώτηση 3. (Chapter 4, 9) 2014α

A network technician has implemented a subnetting scheme and has configured the network of a company with the IP addresses shown in the following diagram:



The network technician made **four mistakes** in the network configuration. In the table below specify the host name, the mistake, the reason it is wrong and a way to correct it.

No	Host Name	Mistake	Reason	Correction
1	H2	192.168.10.46/28	Belongs to a different network	192.168.10.51/28 Or any valid
2	Nicosia	192.168.10.47/28	Broadcast address of subnet	192.168.10.34/28 Or any valid
3	H4	192.168.10.48/28	Network address of subnet	192.168.10.49-62/28 Or any valid
4	H1	192.168.10.61	Def. G/W belongs to a different network/router	192.168.10.17

ΜΕΡΟΣ Δ (16 Μονάδες)

Να απαντήσετε στην πιο κάτω ερώτηση.

2014α

A small private tutoring center's network will be divided in three subnetworks: One for the computer lab (20 PCs and 2 network printers), one for all other classrooms (20 PCs and 5 network printers) and one for the administration office (5 PCs and 3 network printers). The network address for the whole school network is 192.168.16.0/24. Having in mind that the number of subnetworks will be doubled in the near future, answer the following:

- (a) How many subnets will this solution support? 8 (3 + allow for future doubling) (2 pts)
- (b) How many bits will be borrowed from the host portion to implement this solution? 3 ($2^x \geq 8$, so $x = 3$) (2 pts)
- (c) How many hosts can be connected to each subnet? ≤ 30 (5 host bits, $2^5 - 2 = 30$) (3 pts)
- (d) What is the subnet mask for these subnets? 255.255.255.224 (1 pt)
- (e) Complete the table below for all subnets. (8 pts)

Subnet	Network Address	Usable host IP Addresses	Broadcast Address
0	192.168.16.0	192.168.16.1 – 192.168.16.30	192.168.16.31
1	192.168.16.32	192.168.16.33 – 192.168.16.62	192.168.16.63
2	192.168.16.64	192.168.16.65 – 192.168.16.94	192.168.16.95
3	192.168.16.96	192.168.16.97 – 192.168.16.126	192.168.16.127
4	192.168.16.128	192.168.16.129 – 192.168.16.158	192.168.16.159
5	192.168.16.160	192.168.16.161 – 192.168.16.190	192.168.16.191
6	192.168.16.192	192.168.16.193 – 192.168.16.222	192.168.16.223
7	192.168.16.224	192.168.16.225 – 192.168.16.254	192.168.16.255

ΤΕΛΟΣ ΕΞΕΤΑΣΗΣ