

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ  
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΕΚΠΑΙΔΕΥΣΗΣ  
ΛΕΥΚΩΣΙΑ

ΠΑΓΚΥΠΡΙΕΣ  
ΓΡΑΠΤΕΣ ΕΞΕΤΑΣΕΙΣ  
2012  
(ΓΙΑ ΑΠΟΛΥΣΗ)

**Α΄ ΣΕΙΡΑ ΕΞΕΤΑΣΕΩΝ**

**ΜΑΘΗΜΑ : ΔΙΚΤΥΑ - CISCO**

**ΧΡΟΝΟΣ : 2 ώρες**

**ΗΜΕΡΟΜΗΝΙΑ : 13 Ιουνίου**

**ΩΡΑ ΕΝΑΡΞΗΣ : 07.45 π.μ.**

**ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΕΝΤΕΚΑ(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) 2011β 2012α**

What can be determined by using the ping command?

- (a) the number of routers between the source and destination device
- (b) the IP address of the router nearest the destination device
- (c) the average time it takes a packet to reach the destination and for the response to return to the source
- (d) the average time it takes each router in the path between source and destination to respond

**Ερώτηση 2. (Chapter 1) 2011β 2012α**

At which point do individuals and small businesses connect directly to the ISP network to obtain Internet access?

- (a) at an IXP
- (b) at a Metro Ethernet link
- (c) on the ISP extranet
- (d) at a POP

**Ερώτηση 3. (Chapter 2) 2011β 2012α**

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, segments, bits
- (d) segments, packets, frames, bits

**Ερώτηση 4. (Chapter 3) 2011β 2012α**

Which three items are typically found in an MDF?

- (a) user workstations, network equipment racks, fax machines
- (b) switches and routers, network equipment racks, the point of presence
- (c) fax machines, switches and routers, user workstations
- (d) copier, fax machines, user workstations

**Ερώτηση 5. (Chapter 3) 2011β 2012α**

Which statement best describes the operation of a Layer 2 switch?

- (a) functions at the network layer of the OSI model
- (b) forwards traffic from one local IP network to another
- (c) directs traffic from one port to another based on the destination MAC address
- (d) dynamically creates a forwarding table that maps IP addresses to MAC addresses

**Ερώτηση 6. (Chapter 3) 2011β 2012α**

A client requires a networking device that is capable of expansion to accommodate growing network demands. What characteristic must this device have to meet this requirement?

- (a) ability to monitor operation and change the settings for a device
- (b) modular physical configuration
- (c) ability to manage the device remotely
- (d) ports that can be activated and deactivated

**Ερώτηση 7. (Chapter 4) 2011β 2012α**

How many bits are used to represent an IPV6 address?

- (a) 64
- (b) 96
- (c) 256
- (d) 128
- (e) 192

**Ερώτηση 8. (Chapter 4) 2011β 2012α**

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) 224

**Ερώτηση 9. (Chapter 4) 2011β 2012α**

Refer to the exhibit. Which range of IP addresses would allow hosts that are connected to the Router1 Fa0/0 interface to access outside networks?

- (a) 192.168.1.0 through 192.168.1.95
- (b) 192.168.1.66 through 192.168.1.94
- (c) 192.168.1.66 through 192.168.1.96
- (d) 192.168.1.66 through 192.168.1.128

**Ερώτηση 10. (Chapter 5) 2011β 2012α**

A network administrator needs to configure a router. Which of the following connection methods requires network functionality to be accessible?

- (a) console
- (b) AUX
- (c) Telnet
- (d) modem

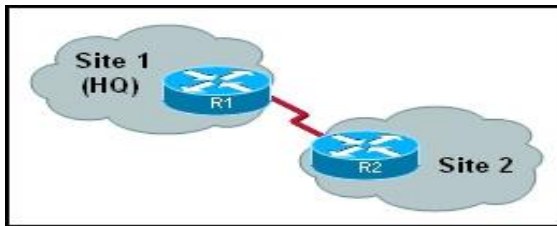
**Ερώτηση 11. (Chapter 5) 2011β 2012α**

A router has a valid operating system but no configuration file is stored in NVRAM. When the router boots up, which mode will display?

- (a) global configuration mode
- (b) setup mode
- (c) ROM monitor mode
- (d) user EXEC mode

**Ερώτηση 12. (Chapter 5) 2011β 2012α**

Refer to the exhibit. For security reasons, information about the HQ R1 router model and IP address should not be accessible from the Site 2 R2 router. What security measure should be implemented?



- (a) Install an IDS between R1 and R2.
- (b) Install an IPS between R1 and R2.
- (c) Install a firewall between R1 and R2.
- (d) **Disable CDP on the R1 interface that connects to R2.**
- (e) Disable any routing protocol used between R1 and R2 and install static routes.

**Ερώτηση 13. (Chapter 6) 2011β 2012α**

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 14. (Chapter 6) 2011β 2012α**

Consider the following 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 15. (Chapter 7) 2011β 2012α**

What is the function of the TCP three-way handshake?

- (a) It enables the synchronization of port numbers between source and destination hosts.
- (b) It immediately triggers the retransmission of lost data.
- (c) **It synchronizes both ends of a connection by allowing both sides to agree upon initial sequence numbers.**
- (d) It identifies the destination application on the receiving host.

**Ερώτηση 16. (Chapter 7) 2011β 2012α**

A user at a high school sends a DNS request for the Fully Qualified Domain Name (FQDN) www.cisco.com. The local DNS server at the school district office checks its cache and finds no relevant record. What will the local DNS server do next?

- (a) **send a DNS query to a root DNS server**
- (b) send a DNS query to a DNS server that manages the HOSTS file
- (c) send a DNS query to a DNS server that manages the .com top level domain
- (d) send a DNS query to a DNS server that manages the cisco.com top level domain

**Ερώτηση 17. (Chapter 8) 2011β 2012α**

What is an advantage of using WPA to secure a wireless network?

- (a) It uses a 128-bit pre-shared hexadecimal key to prevent unauthorized wireless access.
- (b) It uses an advanced encryption key that is never transmitted between host and access point.
- (c) It is supported on older wireless hardware, thus providing maximum compatibility with enterprise equipment.
- (d) It requires the MAC address of a network device that is requesting wireless access to be on a list of approved MAC addresses.

**Ερώτηση 18. (Chapter 8) 2011β 2012α**

When is the use of out-of-band network management necessary?

- (a) when a server needs to be monitored across the network
- (b) when enhanced monitoring features are required to gain an overall view of the entire network
- (c) when the management interface of a device is not reachable across the network
- (d) when it is desirable to use the information that is provided by SNMP

**Ερώτηση 19. (Chapter 9) 2011β 2012α**

After issuing the show interfaces command, a network administrator notices a large number of CRC errors but few collisions. Which problem is more likely to cause this result?

- (a) excessive noise
- (b) duplex mismatch
- (c) incorrect NIC driver
- (d) oversize network diameter

**Ερώτηση 20. (Chapter 9) 2011β 2012α**

A user is having trouble accessing the Internet. A network administrator begins by verifying that the IP address of the PC is correctly configured. Next the administrator pings the default gateway. Based on this information, what type of troubleshooting method is the administrator employing?

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

**Μέρος Β (30 μονάδες)**

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

**Ερώτηση 1. (Chapter 4) 2011β 2012α**

Fill in the blanks in the following statements:

(1 pt for each statement)

- (a) When configuring a router the command to switch from user mode to privileged mode is enable.
- (b) Routing table information, fast switching cache, and packet queues are held in RAM memory.
- (c) NAT allows a large group of private users to access the Internet by sharing one or more public IP addresses.
- (d) A private IP address cannot be routed across the public Internet.
- (e) The IOS image file is kept in the flash memory of the router.
- (f) If a router fails to boot an IOS correctly, it will boot into ROM monitor mode.

**Ερώτηση 2. (Chapter 4) 2011β 2012α**

The table to the left lists six characteristics / protocols of TCP and UDP. You must identify those corresponding to TCP or UDP by writing their number or description under each heading in the table to the right (two of the characteristics/protocols listed should not be used)

(1 pt for each answer)

	Characteristics/Protocols
1	SNMP
2	Connectionless
3	HTTP
4	Sequenced Message Segments
5	No Acknowledgement of Receipt
6	TFTP
7	POP3
8	ICMP

TCP
HTTP
Sequenced Message Segments
POP3
UDP
No Acknowledgement of Receipt
TFTP
Connectionless

**Ερώτηση 3. (Chapter 6) 2011β 2012α**

Identify the routing protocol (RIP or IGRP) that matches the protocol description listed in the table.  
(1 pt for each answer)

	Protocol Description	RIP	IGRP
1	15 hop count maximum	✓	
2	90 second routing update intervals		✓
3	Uses hop count as routing metric	✓	
4	Able to scale to large networks		✓
5	Uses bandwidth and delay as routing metrics		✓
6	30 second routing update intervals	✓	

**Ερώτηση 4. (Chapter 9) 2011β 2012α**

Correspond each of the protocol or technology listed in the following table to the appropriate layer of the OSI model, by writing the layer number/name in the layer answer column.

(0.75 pts each answer)

Layer	A/A	Protocol / Technology	Layer answer
7 - Application	a.	Telnet	7
6 - Presentation	b.	Packets	3
5 - Session	c.	FTP	7
4 - Transport	d.	Radio Waves	1
3 - Network	e.	UDP	4
2 - Data link	f.	NIC (Network Interface Cards)	2
1 - Physical	g.	Port Numbers	4
	h.	Frames	2

**Ερώτηση 5. (Chapter 5) 2012α**

In the following table write the show command that will display what is explained in the "Description" column.  
(1 pts each)

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 info on directly connected neighbors	Show cdp neighbor

**ΜΕΡΟΣ Γ (24 Μονάδες)**

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

**Ερώτηση 1. (Chapter 5) 2011β 2012α**

- (a) Give the necessary commands for configuring and activating the interface fa 0/1 of a router with the IP address 10.1.1.1/30. Assume that the router is in privileged exec mode and that it must return in this mode after configuration. You must show the proper router prompts. (5 pts)

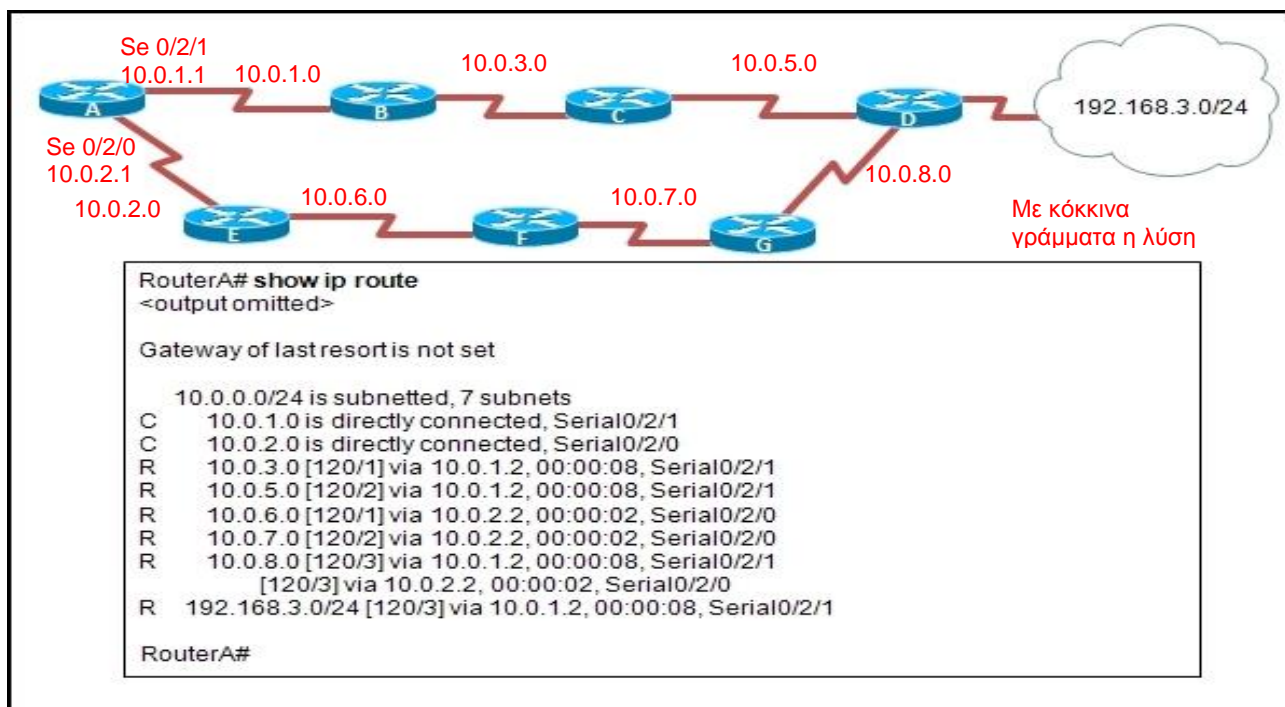
```
Router# configure terminal
Router(config)# interface fa 0/1
Router(config-if)# ip address 10.1.1.1 255.255.255.252
Router(config-if)# no shutdown
Router(config)# exit
Router# exit + exit or ctrl+Z
```

- (b) Give the necessary commands to change the name of a router to **NICOSIA**, set the privileged mode strongly encrypted password to **cisco123** and return to privileged exec mode. (3 pts)

```
Router(config)# hostname NICOSIA (1 pts)
Router(config)# enable secret cisco123 (1 pts)
Router(config)# exit + exit or ctrl+Z
```

**Ερώτηση 2. (Chapter 6) 2011β**

The following graphic shows the output of the **show ip route** command as executed on **router A** in the given network. Assuming that all routers use RIP as the routing protocol and that the serial connections use the first two available host addresses of their corresponding network, answer the questions below:



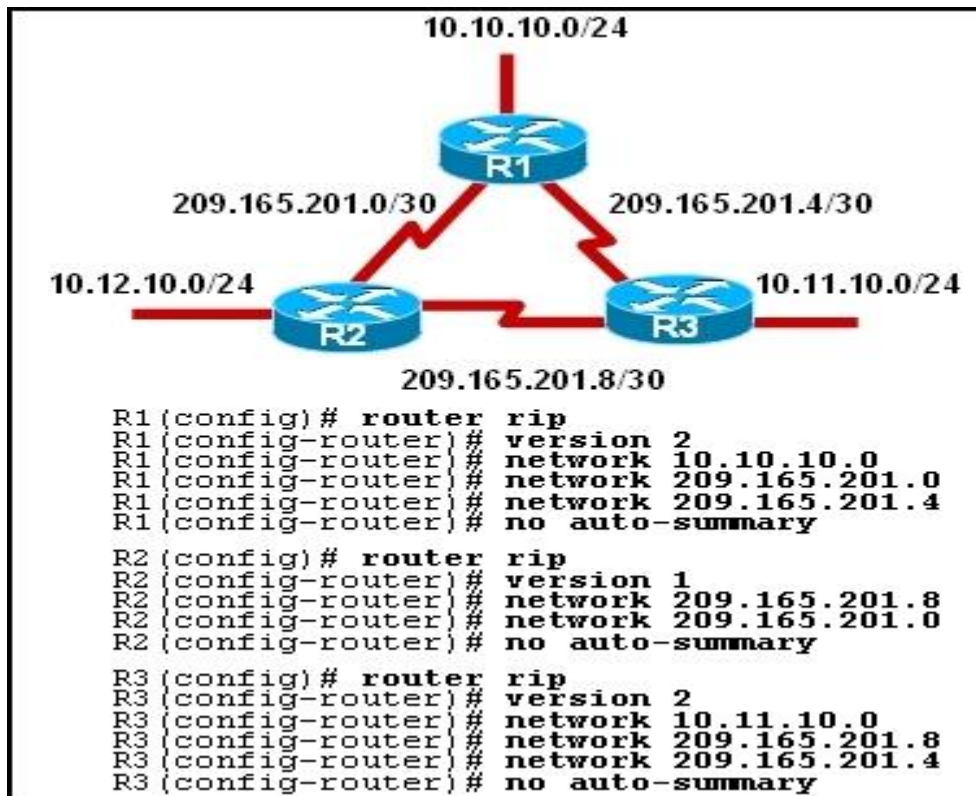
Συνεχίζεται στην επόμενη σελίδα



- (a) Copy the network diagram in your answer book and based on the output of the **show ip route** command write the **network ID** for each network between the routers. (7 pts)
- (b) On the diagram also show the name and the IP address of each of the two serial ports of router A. (1 pt)

### Ερώτηση 3. (Chapter 9) 2011β 2012α

The following graphic lists the configuration for the three routers (R1, R2 and R3) as done by the administrator of the company. As a result, users on the 10.12.10.0/24 network are unable to access any host on the 10.10.10.0/24 network.



- (a) What is the role of the network command in RIP configuration? (2 pts)

It indicates a directly connected network to which it will send and from which it will receive Routing updates via the RIP protocol

- (b) Identify two configuration errors causing this problem. (3 pts)

R2 is using a different version of RIP.  
R2 has a missing network statement for 10.12.10.0.

- (c) Write the commands that need to be executed to correct the problem, assuming that all routers are initially in privileged mode (show router prompts). (3 pts)

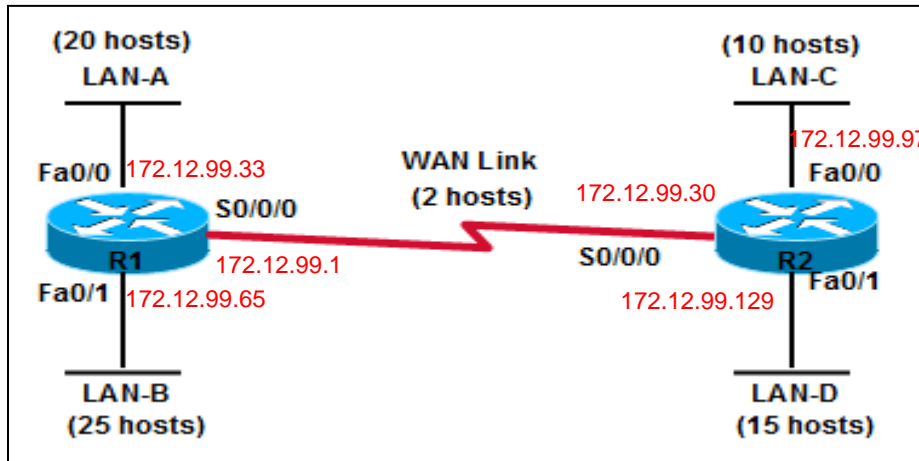
R2(config)# router rip (1 pt)  
R2(config-router)# version 2 (1 pt)  
R2(config-router)# network 209.165.201.8  
R2(config-router)# network 209.165.201.0  
R2(config-router)# network 10.12.10.0 (1 pt)  
R2(config-router)#no auto-summary  
R2(config-router)#exit (not necessary)

**ΜΕΡΟΣ Δ (16 Μονάδες)**

Να απαντήσετε στις πιο κάτω ερωτήσεις στο σενάριο που δίνεται.

2011β 2012α

CSAT Company owns the network shown in the following graphic. The company has been assigned the IP address block **172.12.99.0/24** by their ISP.



Με κόκκινα  
γράμματα η λύση  
στην Ερώτηση 2

Based on the above, answer the following questions:

**Ερώτηση 1. (Chapter 4) 2012α**

(8 pts)

(a)	How many usable addresses are available in the given network?	$2^8 - 2 = 254$ addresses
(b)	What is the dotted decimal subnet mask for a /24 mask?	255.255.255.0
(c)	What is the minimum number of subnets required for this network design?	5 subnets
(d)	How many bits must be borrowed from the host portion of the IP address to allow for that number of subnets (as calculated in question c), and how many total subnets can be created?	3 bits. $2^3 = 8$
(e)	Assuming that the company plans to increase the number of hosts by 20%, how many hosts must the largest subnet support?	30
(f)	What is the number of host bits required to support that many hosts (as in question e)?	5 bits. $2^5 = 32 - 2 = 30$
(g)	What is the subnet mask for the subnetting scheme you have designed	255.255.255.224
(h)	What is the broadcast address of the second subnet (subnet 1)	172.20.99.63

**Ερώτηση 2. (Chapter 4) 2012α**

(3 pts)

Copy the network diagram in your answer book, and assign IP addresses to all router interfaces, based on your subnet design above. Assume that the router interfaces are assigned the first useable IP address of each subnet (if both routers are on the same network segment, assign the last useable IP address to the second router).

**Συνεχίζεται στην επόμενη σελίδα**

**Ερώτηση 3. (Chapter 5) 2012α**

(2 pts)

Give the necessary command/s to configure the message of the day on Router **R1** with the message «This is the Network of CSAT company». Show proper router prompts.

---

```
Gate(config)# banner motd # This is the Network of CSAT company #
```

---

**Ερώτηση 4. (Chapter 5) 2012α**

(3 pts)

The administrator of the company needs to access the two routers through the network. The password «**tasc**» will be used. Write the command/s needed to configure any one of the routers.

---

```
line vty 0 4  
password tasc  
login
```

---

---

**ΤΕΛΟΣ ΕΞΕΤΑΣΗΣ**