

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΠΟΛΙΤΙΣΜΟΥ  
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΕΚΠΑΙΔΕΥΣΗΣ  
ΛΕΥΚΩΣΙΑ

# ΠΑΓΚΥΠΡΙΕΣ ΓΡΑΠΤΕΣ ΕΞΕΤΑΣΕΙΣ 2010 (ΓΙΑ ΑΠΟΛΥΣΗ)

## Α΄ ΣΕΙΡΑ ΕΞΕΤΑΣΕΩΝ

**ΜΑΘΗΜΑ : ΔΙΚΤΥΑ - CISCO**

**ΧΡΟΝΟΣ : 2 ώρες**

**ΗΜΕΡΟΜΗΝΙΑ : 10 Μαΐου**

**ΩΡΑ ΕΝΑΡΞΗΣ : 7.45 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.**

Which command tests for end-to-end device connectivity?

- (a) netstat
- (b) nslookup
- (c) ipconfig
- (d) tracert
- (e) arp

**Ερώτηση 2.**

Which device connects a local LAN to a geographically separate network?

- (a) switch
- (b) hub
- (c) router
- (d) bridge

**Ερώτηση 3.**

Which is a function 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) formats and encodes data for transmission
- (e) transmits data to the next directly connected device

**Ερώτηση 4.**

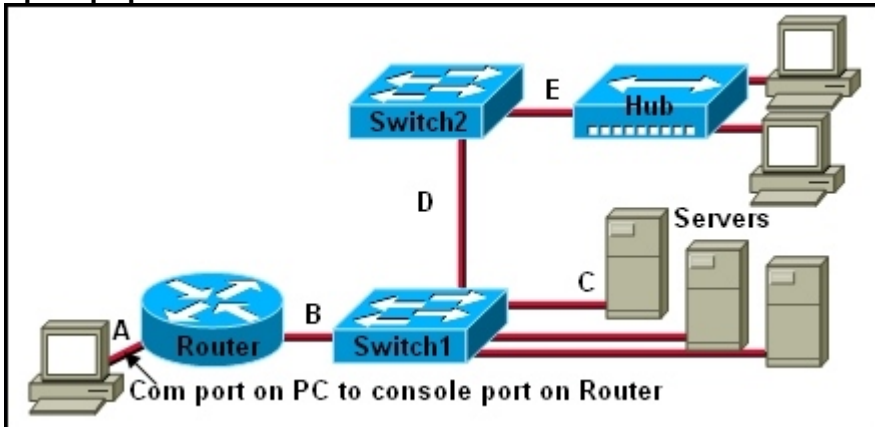
Which address is used by the router to direct a packet between networks?

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

**Ερώτηση 5.**

What is the benefit for a company to use an ISR router?

- (a) An ISR provides the functionality of a switch, router, and firewall in one device.
- (b) ISRs use a PC operating system for routing traffic, thus simplifying configuration and management.
- (c) An ISR is immune to security attacks by hackers and so replaces all other network security measures.
- (d) ISRs make routing decisions at OSI Layer 7, thus providing more intelligence to the network than do other routers.

**Ερώτηση 6.**

Refer to the exhibit. Which type of twisted pair cable is used between each device?

- (a) A=console, B=straight, C=crossover, D= crossover, E=straight
- (b) A=straight, B=straight, C=straight, D=crossover, E=console
- (c) A=console, B=straight, C=straight, D=crossover, E=crossover
- (d) A=crossover, B=straight, C=straight, D=crossover, E=crossover

**Ερώτηση 7.**

What is the network broadcast address for a Class C address of 192.168.32.0 with the default subnet mask?

- (a) 192.168.0.0
- (b) 192.168.0.255
- (c) 192.168.32.0
- (d) 192.168.32.255
- (e) 192.168.255.255

**Ερώτηση 8.**

Which option shows the proper notation for an IPv6 address?

- (a) 2001,0db8,3c55,0015,abcd,ff13
- (b) 2001:0db8:3c55:0015::abcd:ff13
- (c) 2001-0db8-3c55-0015-abcd-ff13
- (d) 2001.0db8.3c55.0015.abcd.ff13

**Ερώτηση 9.**

Which statement accurately describes public IP addresses?

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

**Ερώτηση 10.**

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

- (a) console
- (b) RS232
- (c) AUX
- (d) Telnet
- (e) Modem

**Ερώτηση 11.**

A router has been switched on. Which of the following will be executed first?

- (a) Load start-up configuration
- (b) Load the operating system from flash
- (c) Load the operating system from a TFTP server
- (d) Bootstrap
- (e) POST

**Ερώτηση 12.**

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 13.**

Refer to the exhibit. What can be determined about the network from the exhibited output?

```

MontegoBay> show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater

Device ID      Local Intrfce  Holdtme  Capability Platform      Port ID
Negril         Ser 0/1       146      R           2620           Ser 0/1
Lucia          Ser 0/0       175      R           2621           Ser 0/0
MBSwitch       Fas 0/0       155      S I         WS-C2950-2     Fas 0/11
  
```

- (a) The MontegoBay router does not have any LAN interfaces configured.
- (b) The Negril router is connected to the S0/1 interface of the MontegoBay router.
- (c) There are only four devices in this network.
- (d) Layer 3 is functioning properly on all routers.
- (e) The MBSwitch is connected to the Negril, Lucia, and MontegoBay routers.

**Ερώτηση 14.**

What is the purpose of a routing protocol?

- (a) It is used for building and maintaining ARP tables
- (b) It is used to automatically configure the IP address of a router interface
- (c) It changes private IP addresses to public, so that a packet can travel through the Internet
- (d) It is used for de-encapsulating and encapsulating packets on different interfaces
- (e) It allows a router to share information about known networks with other routers

**Ερώτηση 15.**

Which routing protocol is used to exchange data between two different ISPs?

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

**Ερώτηση 16.**

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 source application on the sending host.
- (e) It identifies the destination application on the receiving host.

**Ερώτηση 17.**

Which protocol is used to retrieve email from a mail server?

- (a) SNMP
- (b) TFTP
- (c) FTP
- (d) IMAP
- (e) SMTP

**Ερώτηση 18.**

What is the term for the public network between the boundary router and the firewall?

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

**Ερώτηση 19.**

A router is configured with a security feature that inspects network packets and only permits those that are responses to legitimate requests. What is the name of this feature?

- (a) Packet blocker
- (b) Port filtering
- (c) Proxy filtering
- (d) Stateful packet inspection
- (e) Intrusion alert

**Ερώτηση 20.**

The command `show interfaces serial 0/1` on a Cisco router has produced the output

**Serial 0/1 is administratively down, line protocol is down.**

Which of the following can be determined?

- (a) Interface Serial 0/1 has not been configured with an IP address
- (b) Interface Serial 0/1 has no cable connected to it.
- (c) Interface Serial 0/1 has been shut down by the administrator.
- (d) A cable is connected to interface Serial 0/1 but no keepalives are received.
- (e) There is a high error rate on Serial 0/1 and the system has automatically disabled it.

**Μέρος Β (30 μονάδες)**

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

**Ερώτηση 1.**

Fill in the blanks in the following statements, which relate to the configuration of a router:  
(1 pt for each statement)

- The command to switch from user mode to privileged mode is \_\_\_\_\_.
- The command to back up the current configuration to a TFTP server is \_\_\_\_\_.
- The command to reboot the router is \_\_\_\_\_.
- The command to display devices found by the Cisco discovery protocol (CDP) is \_\_\_\_\_.
- The start-up configuration file is kept in the \_\_\_\_\_ memory of the router.
- If a router fails to boot an IOS correctly, it will boot into \_\_\_\_\_ mode.

**Ερώτηση 2.**

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 [120/2] via 192.168.10.1, 00:00:24, Serial0/1
```

Fill in the blanks in the following statements: (1 pt for each statement)

- This route was set up using the \_\_\_\_\_ routing protocol.
- The value 120 is called the \_\_\_\_\_.
- This route tells the router where to forward packets for network \_\_\_\_\_.
- The **next hop** interface address is \_\_\_\_\_.
- A packet sent via this route will have to pass through another \_\_\_\_\_ routers before reaching the destination network.
- The next update for this route is expected in \_\_\_\_\_ seconds.

**Ερώτηση 3.**

Correspond each of the routing protocols on the left with the characteristics on the right. Some routing protocols appear in more than one answer. (1 pt each)

Routing Protocol	A/A	Characteristics	Answer
RIP	a.	Non-proprietary link state protocol	
OSPF	b.	Uses the Diffused Update Algorithm (DUAL) to calculate the shortest path to a destination	
EIGRP	c.	Manages routing between Autonomous Systems (AS)	
BGP	d.	Supports routing up to a maximum of 15 hops	
	e.	Maintains a topological map of the whole network in each router	
	f.	Uses hop count as its default metric	

**Ερώτηση 4.**

State the names of the three systematic troubleshooting techniques and give a brief description of each, with reference to the OSI model. (2 pts each)

**Ερώτηση 5.**

Match the protocol name to the port number. Write the correct answer in the column **port answer** (some port numbers will not be used). (1 pt each)

Port numbers
21
22
23
25
53
67
80
1023
8000

A/A	Protocol	port answer
a.	FTP	
b.	SMTP	
c.	TELNET	
d.	HTTP	
e.	DHCP	
f.	DNS	

**ΜΕΡΟΣ Γ (24 Μονάδες)**

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

**Ερώτηση 1.**

Write the necessary commands for configuring a router to have the passwords set as in the table below. All passwords should appear encrypted in the configuration file and the privileged mode password should have strong encryption. The first two commands are given.

Privileged mode password	DISCOVERY
Console password	CISCOadmin
Telnet password (for all telnet connections)	guesswhat

```
Router>enable
Router#config t
```

**Ερώτηση 2.**

Write the necessary commands to configure the following interfaces on a router. After configuration, the router should be left in privileged EXEC mode (not in configuration mode):

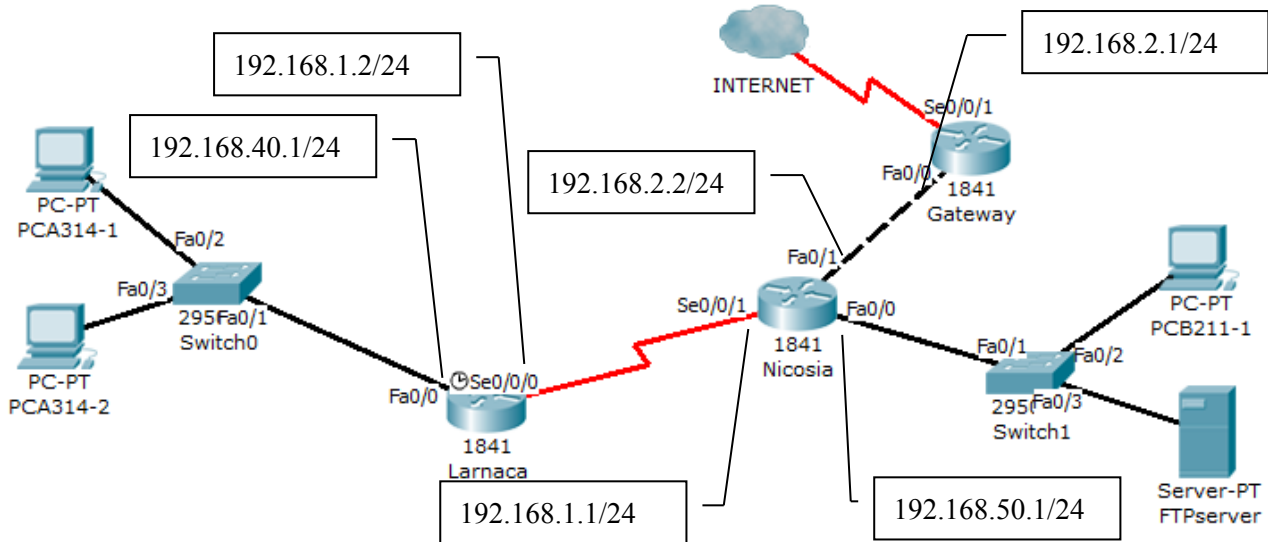
Interface	IP Address	Comment
FA 0/1	192.168.10.1	
Serial 0/0	192.168.42.1	Act as DCE at 56000 bps

```
Router>enable
Router#conf t
```



**Ερώτηση 3.**

Answer the following questions based on the network below:



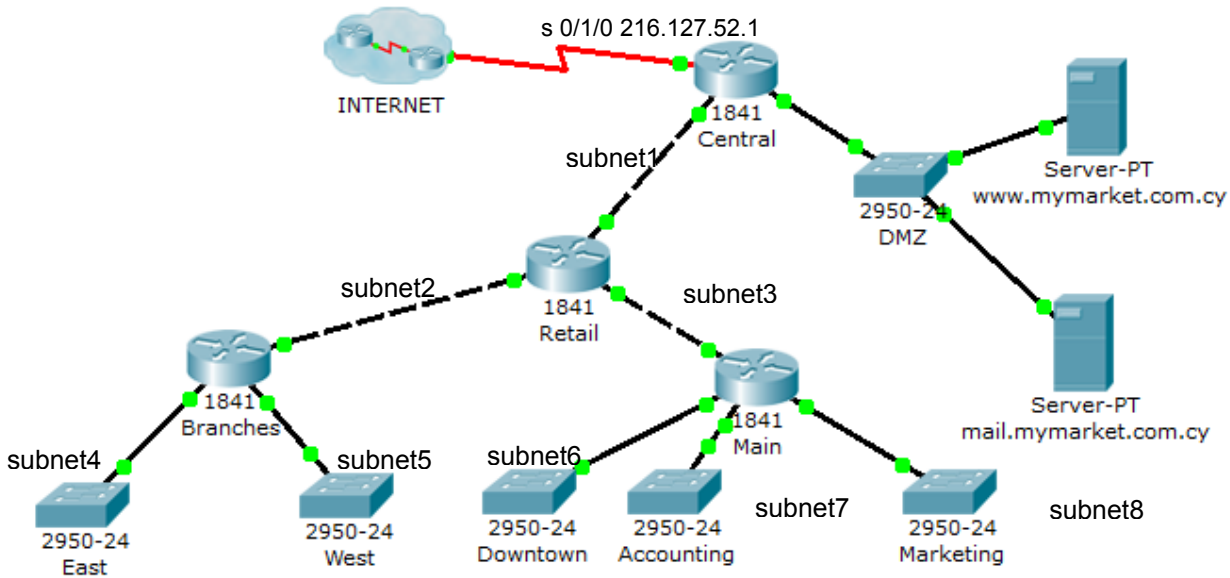
a. Give the necessary commands for configuring RIP v2 on routers Larnaca and Nicosia, so that routes to all connected networks are created on both routers. Assume that both routers are initially in global configuration mode. You must clearly indicate which commands should be entered on Nicosia and which commands should be entered on Larnaca. (6 pts)

b. Write the necessary commands to set up the default route of router Nicosia and router Larnaca, so that packets to unknown networks are forwarded to router Gateway. (2 pts)

**Nicosia (config) #**

**Larnaca (config) #**

**ΜΕΡΟΣ Δ (16 Μονάδες)**  
 Να απαντήσετε στην πιο κάτω ερώτηση.



Consider the above network diagram, which shows the network of MyMarket, a supermarket chain. The five departments/branches and the remaining subnets (subnet1–subnet8) must be assigned addresses, by subnetting network 192.168.200.0. Each of the five departments (subnet4 to subnet8) can have **up to 12 hosts** and the company wishes to have the **maximum number of possible spare subnets for future expansion**.

Answer the following questions:

- a. How many bits must be borrowed from the host part to create these subnets?

(2 pts)

- b. What is the subnet mask for these subnets?

(1 pt)

- c. How many subnets in total can we have on this network?

(1 pt)

- d. How many spare subnets are available for future expansion? (assume all subnets are useable.)

(1 pt)

- e. Assign the first available subnet to subnet1, the second to subnet2, and so on and fill in the following table. Assign the first useable IP address as the default gateway of each subnet: (8 pts)

Subnet	Subnet address	Default gateway	Broadcast address
Subnet1			
subnet2			

subnet3			
subnet4 (East)			
subnet5 (West)			
subnet6 (Downtown)			
subnet7 (Accounting)			
subnet8 (Marketing)			

- f. The following configuration file is loaded to a router. Identify and describe briefly three problems, which relate to the configuration settings provided in this file. (3 pts)

```
!  
interface FastEthernet0/0  
ip address 192.168.100.33 255.255.255.192  
no shutdown  
!  
interface FastEthernet0/1  
ip address 192.168.100.62 255.255.255.224  
no shutdown  
!  
interface Serial0/0/0  
ip address 19.25.32.16 255.255.255.252  
encapsulation ppp  
no shutdown  
!  
interface Serial0/0/1  
encapsulation ppp  
ip address 172.12.32.31 255.255.255.240  
no shutdown  
!
```

ΤΕΛΟΣ ΕΞΕΤΑΣΗΣ