

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ, ΠΟΛΙΤΙΣΜΟΥ, ΑΘΛΗΤΙΣΜΟΥ ΚΑΙ ΝΕΟΛΑΙΑΣ
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

ΟΔΗΓΟΣ ΔΙΟΡΘΩΣΗΣ – ΠΡΟΤΕΙΝΟΜΕΝΕΣ ΛΥΣΕΙΣ

ΓΡΑΠΤΗ ΑΞΙΟΛΟΓΗΣΗ Β΄ ΤΕΤΡΑΜΗΝΟΥ 2020-21
Β΄ ΤΑΞΗΣ ΛΥΚΕΙΟΥ
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ΕΞΕΤΑΖΟΜΕΝΟ ΜΑΘΗΜΑ: ΔΙΚΤΥΑ – ΑΚΑΔΗΜΙΑ CISCO (Α΄ ΣΕΙΡΑ)

ΚΩΔΙΚΟΣ ΜΑΘΗΜΑΤΟΣ: Β060

ΣΥΝΟΛΙΚΗ ΔΙΑΡΚΕΙΑ ΓΡΑΠΤΗΣ ΕΞΕΤΑΣΗΣ ΔΙΚΤΥΩΝ – ΑΚΑΔΗΜΙΑΣ CISCO:
90΄ λεπτά

ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΕΝΤΕΚΑ (11) ΣΕΛΙΔΕΣ

ΟΔΗΓΙΕΣ (για τους εξεταζόμενους)

1. Στο εξώφυλλο του τετραδίου απαντήσεων να συμπληρώσετε όλα τα κενά με τα στοιχεία που ζητούνται.
2. **Να απαντήσετε ΟΛΑ τα ερωτήματα**
3. **Να μην αντιγράψετε τα θέματα** στο τετράδιο απαντήσεων.
4. Να μη γράψετε πουθενά στις απαντήσεις σας το όνομά σας.
5. Να απαντήσετε στο τετράδιό σας σε όλα τα θέματα **μόνο με μπλε πένα ανεξίτηλης μελάνης**. Μολύβι επιτρέπεται, μόνο αν το ζητάει η εκφώνηση, και μόνο για σχήματα, πίνακες, διαγράμματα κλπ.
6. Απαγορεύεται η χρήση διορθωτικού υγρού ή διορθωτικής ταινίας.
7. Επιτρέπεται η χρήση μη προγραμματιζόμενης υπολογιστικής μηχανής που φέρει τη σφραγίδα του σχολείου.

ΣΑΣ ΕΥΧΟΜΑΣΤΕ ΚΑΛΗ ΕΠΙΤΥΧΙΑ

ΜΕΡΟΣ Α. (30 μονάδες)

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

Ερώτηση 1. (ch3.5. 2021)

What layer is responsible for routing messages through an internetwork in the TCP/IP model?

- (a) Transport
- (b) Internet
- (c) Session
- (d) Network access

Ερώτηση 2. (ch3.5. 2021)

At which layer of the OSI model would a physical address be added during encapsulation?

- (a) physical layer
- (b) data link layer
- (c) network layer
- (d) transport layer

Ερώτηση 3. (ch3.3. 2021)

What is the name of the OSI Layer that is located between Physical and Network?

- (a) Session
- (b) Transport
- (c) Data-Link
- (d) Application

Ερώτηση 4. (ch4.1. 2021)

What is a primary role of the Physical layer in transmitting data on the network?

- (a) provide physical addressing to the devices
- (b) determine the path packets take through the network
- (c) control data access to the media
- (d) create the signals that represent the bits in each frame on to the media

Ερώτηση 5. (ch4.2. 2021)

What is the definition of throughput?

- (a) the capacity at which a medium can carry data
- (b) the measure of the transfer of bits across a medium over a given period of time
- (c) the amount of time, including delays, for data to travel from one point to another
- (d) the measure of usable data transferred over a given period of time

Ερώτηση 6. (ch7.1. 2021)

Which part of an Ethernet frame detects errors in the frame?

- (a) Ether type
- (b) Preamble
- (c) Start of Frame Delimiter
- (d) Frame Check Sequence

Ερώτηση 7. (ch7.4. 2021)

What is the auto-MDIX feature on a switch?

- (a) the ability to turn a switch interface on or off accordingly if an active connection is detected
- (b) the automatic configuration of full-duplex operation over a single Ethernet copper or optical cable
- (c) the automatic configuration of an interface for a straight-through or a crossover Ethernet cable connection
- (d) the automatic configuration of an interface for 10/100/1000 Mb/s operation

Ερώτηση 8. (ch8.4. 2021)

A computer can access devices on the same network but cannot access devices on other networks. What is the probable cause of this problem?

- (a) The cable is not connected properly to the NIC
- (b) The computer has an invalid default gateway address
- (c) The computer has an incorrect subnet mask
- (d) The computer has an invalid IP address

Ερώτηση 9. (ch8.5. 2021)

Which parameter does the router use to choose the path to the destination when there are multiple routes available?

- (a) the higher gateway IP address to get to the destination network
- (b) the higher metric value that is associated with the destination network
- (c) the lower gateway IP address to get to the destination network
- (d) the lower metric value that is associated with the destination network

Ερώτηση 10. (ch9.2. 2021)

Which destination address is used in an ARP request frame?

- (a) 0.0.0.0
- (b) 255.255.255.255
- (c) FFFF.FFFF.FFFF
- (d) The physical address of the destination host

Ερώτηση 11. (ch9.1. 2021)

What destination MAC address would be included in a frame sent from a source device to a destination device on a remote local network?

- (a) FFFF.FFFF.FFFF
- (b) The MAC address of the destination device
- (c) The MAC address of the source device
- (d) The MAC address of the local router

Ερώτηση 12. (ch10.3. 2021)

The global configuration command **ip default-gateway 172.16.100.1** is applied to a switch. What is the effect of this command?

- (a) The switch can be remotely managed from a host on another network.
- (b) The switch can communicate with other hosts on the 172.16.100.0 network.
- (c) The switch is limited to sending and receiving frames to and from the gateway 172.16.100.1
- (d) The switch will have a management interface with the address 172.16.100.1

Ερώτηση 13. (ch11.5. 2021)

How many bits must be borrowed from the host portion of an address to accommodate a router with nine connected networks?

- (a) Two
- (b) Three
- (c) **Four**
- (d) Five

Ερώτηση 14. (ch12.2. 2021)

Which is the compressed format of the IPv6 address 2001:0db1:0000:0110:ab00:0000:0000:0000 ?

- (a) **2001:db1:0:110:ab00::**
- (b) 2001:0db1::0110:ab00::
- (c) 2001:0db1:0:011:ab::
- (d) 2001:0db1:0000:0110:ab00::

Ερώτηση 15. (ch13.2. 2021)

Which protocol is used by the traceroute command to send and receive echo-requests and echo-replies?

- (a) SNMP
- (b) **ICMP**
- (c) TCP
- (d) UDP

Ερώτηση 16. (ch13.1. 2021)

A technician uses the ping 127.0.0.1 command. What is the technician testing?

- (a) **the TCP/IP stack on a network host**
- (a) connectivity between two adjacent Cisco devices
- (b) connectivity between a PC and the default gateway
- (c) connectivity between two PCs on the same network

Ερώτηση 17. (ch14.5. 2021)

A PC is downloading a large file from a server. The TCP window is 5000 bytes. The server is sending the file using 200-byte segments. How many segments will the server send before it requires an acknowledgment from the PC?

- (a) 5 segments
- (b) **25 segments**
- (c) 50 segments
- (d) 1 segment

Ερώτηση 18. (ch14,6 2021)

What information is used by TCP to reassemble and reorder received segments?

- (a) port numbers
- (b) **sequence numbers**
- (c) acknowledgment numbers
- (d) fragment numbers

Ερώτηση 19. (ch15.3 2021)

What is the function of the HTTP GET message?

- (a) to retrieve client email from an email server using TCP port 110
- (b) to upload content to a web server from a web client
- (c) to send error information from a web server to a web client
- (d) to request an HTML page from a web server

Ερώτηση 20. (ch15.1. 2021)

Which layer in the OSI model is used for formatting, compressing, and encrypting data?

- (a) Application
- (b) Presentation
- (c) Session
- (d) Transport

Μέρος Β (30 μονάδες)

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

Ερώτηση 1. (ch10 ch11. 2021)

(A) Fill the last column with YES or NO if the 2 addresses belong to the same network or not.

(3 pts)

	IP address A	IP address B	Belong to the same network? YES or NO
(a)	192.16.25.100/27	192.16.25.120/27	YES
(b)	172.16.0.1/18	172.168.0.2/19	NO
(c)	192.168.12.100/25	192.168.13.101/25	NO

(B) Description of switch frame forwarding methods are provided at the table below. Match the descriptions with the methods.

(3 pts)

		(1) Store-and-Forward	(2) Cut-Through
(a)	Buffers frames until the full frame has been received by the switch	*	
(b)	No error checking on frames is performed by the switch before releasing the frame out of its port		*
(c)	The faster switching method		*

Ερώτηση 2. (ch14.2-14.3. 2021)

Write next to each application the protocol that is using TCP or UDP or BOTH.

(3 pts)

	Application	Protocol (TCP or UDP or BOTH)
(a)	TFTP	UDP
(b)	HTTP	TCP
(c)	DHCP	UDP
(d)	TCP	TCP
(e)	SSH	TCP
(f)	DNS	BOTH

Ερώτηση 3. (ch3.3-7.1 2021)

(A) Write down the wire colors to build a **T568B** cable pinout that can be used as an Ethernet Straight Through cable. (3 pts)

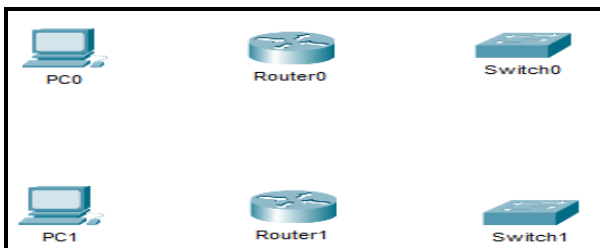
1	2	3	4	5	6	7	8
Orange white	Orange	Green White	Blue	Blue white	Green	Brown white	Brown

(B) Fill the Ethernet Frame with the correct order of its fields. (3 pts)

(Destination MAC Address – Type/Length – Preamble and SDF – FCS – Source MAC Address – Data)

Ethernet frame fields					
(a) 8 bytes	(b) 6 bytes	(c) 6 bytes	(d) 2 bytes	(e) 46-1500 bytes	(f) 4 bytes
Preamble and SDF	Destination MAC Address	Source MAC Address	Type / Length	Data	FCS

Ερώτηση 4. Refer to the exhibit. (ch4. 2021)



Complete the following table (6 pts)

	Connection	Appropriate Cable (crossover or straight or rollover)
(a)	Switch1 with Switch0 (ethernet port)	Crossover
(b)	Router0 with Router1 (ethernet port)	Crossover
(c)	PC0 with Router 1 (ethernet port)	Crossover
(d)	PC1 with Switch0 (ethernet port)	Straight
(e)	Router0 with Switch1 (ethernet port)	Straight
(f)	PC0 (RS-232/usb port) with Router 1	Rollover

Ερώτηση 5. (ch7.3. 2021)

Five (5) PCs are connected to a switch. Their MAC addresses and the port of the switch that are connected are shown to the table below. Determine how the switch will forward the frame and answer if the switch will add the source MAC address to the MAC table, for each of the three (3) scenarios below.

PC	Port Connected	MAC Address
PC1	F0/1	0A
PC2	F0/2	0B
PC3	F0/3	0C
PC4	F0/4	0D
PC5		
PC6	F0/0	0E

A) Scenario 1

(2 pts)

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
0A	0B	0C			

Frame	
Destination MAC	Source MAC
0A	0C

(a) Write the ports where the Switch will forward the frame: F0/1

(b) The switch will add the source MAC to the MAC table (YES / NO): NO

B) Scenario 2

(2 pts)

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
0A	0B				0E

Frame	
Destination MAC	Source MAC
0D	0C

(a) Write the ports where the Switch will forward the frame: F0/1, F0/2, F0/4, F0/6

(b) The switch will add the source MAC to the MAC table (YES / NO): YES

C) Scenario 3

(2 pts)

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
0A	0B				

Frame	
Destination MAC	Source MAC
0C	0A

(a) Write the ports where the Switch will forward the frame: F0/2, F0/3, F0/4, F0/6

(b) The switch will add the source MAC to the MAC table (YES / NO): NO

ΜΕΡΟΣ Γ (40 Μονάδες)

Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με είκοσι (20) μονάδες.

Ερώτηση 1. (Ch11.6. 2021)

You are the administrator of the network 192.168.22.0

A) Complete the following table: **Before Subnetting**

(4 pts)

(a)	Network IP Class:	C
(b)	Subnet Mask:	255.255.255.0
(c)	Number of Usable hosts:	254
(d)	Broadcast Address:	192.168.22.255

B) You must divide network 192.168.22.0 to smaller equal subnets. Each subnet should contain 28 hosts so that you would waste the least number of IP addresses.

Complete the following table: **After Subnetting**

(4 pts)

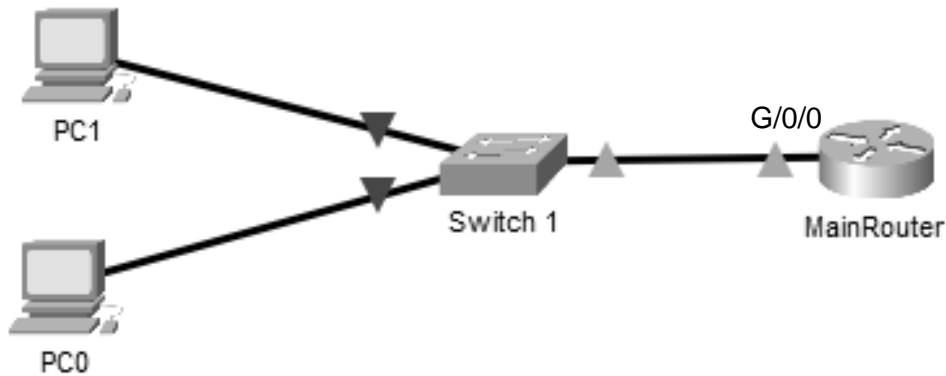
(a)	Subnet Mask:	255.255.255.224
(b)	Number of available subnets	8
(c)	Number of addresses in each subnet:	32
(d)	Number of usable hosts addresses in each subnet:	30

C) Fill the table with the **Subnet Address, Host Usable Addresses and Broadcast Addresses** for each of the three subnets below. **The first subnet number is 0** (12 pts)

Subnet number	Subnet Address	Usable Host Range	Broadcast Address
1	192.168.22.32	192.168.22.33 - 192.168.22.62	192.168.22.63
4	192.168.22.128	192.168.22.129 - 192.168.22.158	192.168.22.159
7	192.168.22.224	192.168.22.225 - 192.168.22.254	192.168.22.255

Ερώτηση 2. (Ch2. 2021)**Topology**

We have the following private network with IP address 192.168.10.0/24



Write the commands to configure the Router: (be careful to move to the right mode) (20 pts)

(A) Named the device as **MainRouter**.

```
Router> enable
_____
configure terminal
_____
hostname MainRouter
_____
```

(B) Assign **Ciscoenpa55** as the encrypted privileged EXEC mode password.

```
MainRouter# conf t
_____
enable secret Ciscoenpa55
_____
```

(C) Assign **Ciscoconpa55** as the console password and enable login.

```
MainRouter # conf t
_____
line console 0
_____
password Ciscoconpa55
_____
login
_____
```

(D) **Encrypt** all plaintext passwords.

```
MainRouter(config) # service password-encryption
_____
```

(E) Create a **banner** that warns anyone accessing the device that unauthorized access is prohibited. Make sure to include the word **Warning** in the banner.

```
MainRouter(config) # banner motd "Warning"
_____
```

- (F) Configure the IPv4 address of the **GigabitEthernet0/0** interface with the **first usable address**.

```
MainRouter (config)# interface g0/0  
ip address 192.168.10.1 255.255.255.0  
no shutdown
```

- (G) Configure 192.168.10.1 as the **default gateway** for S1.

```
Switch_1> enable  
configure terminal  
ip default-gateway 192.168.10.1
```

- (H) **Show** the running-configuration.

```
MainRouter> enable  
show running-configuration
```

- (I) **Save** the configuration.

```
MainRouter# copy running-config startup-config
```

ΤΕΛΟΣ ΕΞΕΤΑΣΗΣ