ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ, ΠΟΛΙΤΙΣΜΟΥ, ΑΘΛΗΤΙΣΜΟΥ ΚΑΙ ΝΕΟΛΑΙΑΣ
ΔΙΕΥΘΥΝΣΗ ΜΕΣΗΣ ΓΕΝΙΚΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

ΕΝΙΑΙΑ ΓΡΑΠΤΗ ΑΞΙΟΛΟΓΗΣΗ Α΄ ΤΕΤΡΑΜΗΝΟΥ 2022-23
Β΄ ΤΑΞΗΣ ΛΥΚΕΙΟΥ
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ΕΞΕΤΑΖΟΜΕΝΟ ΜΑΘΗΜΑ: ΔΙΚΤΥΑ - CISCO (Α΄ΣΕΙΡΑ)

ΚΩΔΙΚΟΣ ΜΑΘΗΜΑΤΟΣ: Β060

ΣΥΝΟΛΙΚΗ ΔΙΑΡΚΕΙΑ ΓΡΑΠΤΗΣ ΕΞΕΤΑΣΗΣ ΔΙΚΤΥΩΝ CISCO: 90 λεπτά

ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΕΝΤΕΚΑ (11) ΣΕΛΙΔΕΣ

ΟΔΗΓΙΕΣ (για τους εξεταζομένους)

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 κ.λπ.
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 ΚΑΘΕ ΕΠΙΤΥΧΙΑ

ΜΕΡΟΣ Α. (30 μονάδες)

Να απαντήσετε και στις είκοσι (20) ερωτήσεις πολλαπλής επιλογής. Υπάρχει μόνο μια σωστή απάντηση σε κάθε ερώτηση. Η κάθε ερώτηση βαθμολογείται με 1½ μονάδα.

Ερώτηση 1.

What is the Internet?

(a) It is a private network with LAN and WAN connections.
(b) It is a network which provides access to mobile devices.
(c) It is a network based on Ethernet technology.
(d) It is a worldwide collection of interconnected LANs and WANs.

Ερώτηση 2.

What is an Internet Service Provider (ISP)?

(a) It is a protocol that establishes how computers within a local network communicate.
(b) It is a networking device that combines the functionality of several different devices in one.
(c) It is a standards body that develops cabling and wiring standards for networking.
(d) It is an organization that enables individuals and businesses to connect to the Internet.

Ερώτηση 3.

Which media is being used to transmit the data, when data is encoded as pulses of light?

(a) Coaxial cable
(b) Fiber Optic cable
(c) UDP cable
(d) Wireless

Ερώτηση 4.

What is the default Switch Virtual Interface (SVI) on a Cisco switch?

(a) VLAN 1
(b) VLAN 100
(c) VLAN 192
(d) VLAN 999

Ερώτηση 5.

Which memory location on a Cisco router or switch will lose all content when the device is restarted?

(a) NVRAM
(b) flash
(c) ROM
(d) RAM

Ερώτηση 6.
Which message delivery option is used when all devices need to receive the same message simultaneously?
(a) broadcast
(b) multicast
(c) anycast
(d) unicast

Ερώτηση 7.
What is the general term that is used to describe a piece of data at any layer of a networking model?
(a) packet
(b) protocol data unit (PDU)
(c) frame
(d) segment

Ερώτηση 8.
Which procedure is used to reduce the effect of crosstalk in copper cables?
(a) requiring proper grounding connections
(b) avoiding sharp bends during installation
(c) designing a cable infrastructure to avoid crosstalk interference
(d) twisting opposing circuit wire pairs together

Ερώτηση 9.
What is the characteristic of fiber-optic cable?
(a) Each pair of cables is wrapped in metallic foil.
(b) It combines the technique of cancellation, shielding, and twisting to protect data.
(c) It typically contains 4 pairs of fiber-optic wires.
(d) It is more expensive than UTP cabling.

Ερώτηση 10.
Which physical medium which uses electrical pulses?
(a) bandwidth
(b) fiber-optic cable
(c) copper cable
(d) air

Ερώτηση 11.
Which of the below is an invalid hexadecimal number?
(a) b
(b) x
(c) c
(d) f

Ερώτηση 12.
How many bits are in an IPv4 address?
(a) 256
(b) 128
(c) 64
(d) 32

Ερώτηση 13.
What method is used to manage contention-based access on a wireless network?
(a) CSMA/CA
(b) CSMA/CD
(c) Token ring
(d) Bus

Ερώτηση 14.
What is the function of the CRC value that is found in the FCS field of a frame?
(a) to verify the physical address in the frame
(b) to verify the logical address in the frame
(c) to compute the checksum header for the data field in the frame
(d) to verify the integrity of the received frame

Ερώτηση 15.
Which intermediary device uses MAC address table for its forwarding decisions?
(a) router
(b) modem
(c) switch
(d) Hub

Ερώτηση 16.
Which is a broadcast MAC address?
(a) FF-FF-FF-FF-FF-FF
(b) 5C-26-0A-4B-19-3E
(c) 01-00-5E-00-00-03
(d) 00-26-0F-4B-00-3E

Ερώτηση 17.
When a router receives a packet, what information in the packet is examined in order to be forwarded towards its destination?
(a) source IP address
(b) destination data-link address
(c) source data-link address
(d) destination IP address

Ερώτηση 18.
A computer has to send a packet to a destination host in the same LAN. How will the packet be sent?

(a) The packet will be sent directly to the destination host.
(b) The packet will be sent to the default gateway first, and then, depending on the response from the gateway, it may be sent to the destination host.
(c) The packet will first be sent to the default gateway, and then from the default gateway it will be sent directly to the destination host.
(d) The packet will be sent only to the default gateway.

Ερώτηση 19.
Which field in the IPv4 header is used to prevent a packet from traversing a network endlessly?

(a) Time-to-Live (TTL)
(b) Sequence Number (SN)
(c) Acknowledgment Number (ACK)
(d) Differentiated Services (DS)

Ερώτηση 20.
What important information is examined in the Ethernet frame header by a Layer 2 device in order to forward the data onward

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

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

Ερώτηση 1.

(a) What is the hexadecimal equivalent of decimal 254?

(b) What is the hexadecimal equivalent of decimal 77?

(c) What is the decimal equivalent of hexadecimal AC?

(d) What is the decimal equivalent of hexadecimal DC?

(e) What is the dotted decimal value of the IPV4 address with dotted binary representation11000000.10101000.01100100.11001000?

(f) What is the dotted binary representation of the IPv4 address with dotted decimal representation 172.16.20.2?

Ερώτηση 2.

Write down the wire colors for each pin of each connector to build a Straight-Through with T568B in each connector.

Pin / Connector	1	2	3	4	5	6	7	8
T568B				Blue			Brown white	

Ερώτηση 3.

Assign the below Network Components into following Categories:

Network Components

1	
2	 Wireless Router
3	 Laptop
4	 Desktop Computer
5	LAN
6	 Router

Categories

(a) End Devices	(b) Intermediary Devices	(c) Network Media

Ερώτηση 4.

Select the appropriate column to identify the network architecture requirement to which each characteristic or feature belongs:

Network Requirement	Characteristic / Feature			
	(a) Fault Tolerance	(b) Scalability	(c) Quality of Service	(d) Security
1. Business and personal data must be protected				
2. Networks can grow or expand with minimal impact on performance				
3. Developing a plan for priority queuing in a strategy for quality delivery information				
4. Business and personal network equipment must be protected				
5. Priority queues are implemented when demand for network bandwidth exceeds supply				
6. Networks should always be available				

Ερώτηση 5.

The two layered models that are used to describe network operations are the OSI Reference Model and the TCP/IP Reference Model.

The two layered models are partially completed below. Complete the table with missing layers names.

OSI Model	
7	
6	Presentation
5	
4	Transport
3	
2	
1	Physical

TCP/IP Model	
Application	4
	3
Internet	2
	1

ΜΕΡΟΣ Γ (40 Μονάδες)
Να απαντήσετε σε όλες τις ερωτήσεις. Η κάθε ερώτηση βαθμολογείται με είκοσι (20) μονάδες.

Ερώτηση 1.
Five (5) PCs are connected to a switch. Their MAC addresses and the port of the switch that are connected are shown in the table below. Determine how the switch will forward the frame and answer if it will add the source MAC address to the MAC table, for each of the five (5) scenarios below.

PC	MAC Address	Port Connected
PC1	AA	F0/1
PC2	BB	F0/2
PC3	CC	F0/3
PC4	DD	F0/4
PC5	EE	F0/5
		F0/6

Scenario 1

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
	BB				

Frame	
Destination MAC	Source MAC
FF	CC

(a) Write the port(s) where the Switch will forward the frame: _____
(b) The switch will add the source MAC to the MAC table? (YES / NO): _____

Scenario 2

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
AA				EE	

Frame	
Destination MAC	Source MAC
EE	BB

(a) Write the port(s) where the Switch will forward the frame: _____
(b) The switch will add the source MAC to the MAC table? (YES / NO): _____

Scenario 3

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
AA					

Frame	
Destination MAC	Source MAC
EE	DD

(a) Write the port(s) where the Switch will forward the frame: _____

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

Scenario 4

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
AA	BB				

Frame	
Destination MAC	Source MAC
BB	AA

(a) Write the port(s) where the Switch will forward the frame: _____

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

Scenario 5

MAC Table					
F0/1	F0/2	F0/3	F0/4	F0/5	F0/6
	BB	CC	DD	EE	

Frame	
Destination MAC	Source MAC
AA	CC

(a) Write the port(s) where the Switch will forward the frame: _____

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

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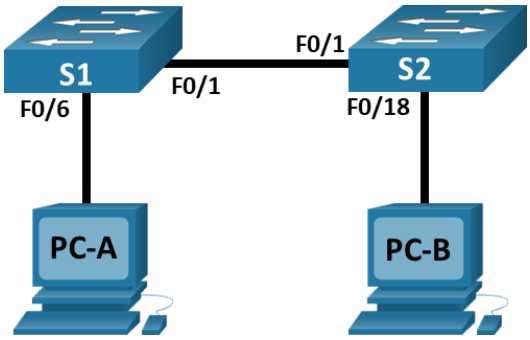
Ερώτηση 2.

Refer to the network topology and addressing table below.

Network Topology



Addressing Table

Device	Interface	IP Address	Subnet Mask
S1	VLAN 1	192.168.0.10	255.255.255.0
S2	VLAN 1	192.168.0.11	255.255.255.0
PC-A	NIC	192.168.0.100	255.255.255.0
PC-B	NIC	192.168.0.101	255.255.255.0

Configure and verify basic Switch (S1) settings:

(a) Enter the global configuration mode and give the switch a name according to the Addressing Table (3 pts).
Switch>
Switch#
Switch(config)#

(b) Set up the message of the day banner **"Exams January 2023"** (1 pt).
S1(config)#

(c) Configure and enable the SVI according to the Addressing Table (3 pts).
S1(config)#
S1(config-if)#
S1(config-if)#

(d) Secure the switch by using **exams23** as the encrypted privileged EXEC password, **cisco23** as the password for console access and **ciscoexam23** as a password for remote access. Return to configuration mode (8 pts).
S1(config)#
S1(config)#
S1(config-line)#
S1(config-line)#
S1(config-line)#
S1(config-line)#
S1(config-line)#
S1(config-line)#

(e) Encrypt all the plain text passwords (1 pt).
S1(config)#

(f) Return to the Privileged EXEC Mode and save the configuration (2 pt).
S1(config)#
S1#

(g) Display the current configuration (1 pt).
S1#

(h) Ping the PC-A (IP address 192.168.0.100) (1 pt).
S1#

ΤΕΛΟΣ ΕΞΕΤΑΣΤΙΚΟΥ ΔΟΚΙΜΙΟΥ