

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

ΔΕΙΓΜΑΤΙΚΟ ΔΟΚΙΜΙΟ

ΕΝΙΑΙΑ ΓΡΑΠΤΗ ΤΕΛΙΚΗ ΑΞΙΟΛΟΓΗΣΗ 2022-23

Γ' ΤΑΞΗΣ ΛΥΚΕΙΟΥ ΕΞΕΤΑΖΟΜΕΝΟ ΜΑΘΗΜΑ: ΔΙΚΤΥΑ-CISCO

ΣΥΝΟΛΙΚΗ ΔΙΑΡΚΕΙΑ ΓΡΑΠΤΗΣ ΕΞΕΤΑΣΗΣ ΔΙΚΤΥΩΝ: 90 λεπτά

ΤΟ ΕΞΕΤΑΣΤΙΚΟ ΔΟΚΙΜΙΟ ΑΠΟΤΕΛΕΙΤΑΙ ΑΠΟ ΔΕΚΑΕΠΤΑ (17) 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 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.

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 advantage does SSH offer over Telnet?

- (a) encryption
- (b) more connection lines
- (c) connection-oriented services
- (d) username and password authentication

Ερώτηση 2.

What is one function of a Layer 2 switch?

- (a) forwards data based on logical addressing
- (b) duplicates the electrical signal of each frame to every port
- (c) learns the port assigned to a host by examining the destination MAC address
- (d) determines which interface is used to forward a frame based on the destination MAC address

Ερώτηση 3.

What is the purpose of the vlan.dat file on a switch?

- (a) It holds the saved configuration.
- (b) It holds the operating system.
- (c) It holds the running configuration.
- (d) It holds the VLAN database.

Ερώτηση 4.

Which type of inter-VLAN communication design requires the configuration of multiple subinterfaces?

- (a) router on a stick
- (b) legacy inter-VLAN routing
- (c) routing via a multilayer switch
- (d) routing for the management VLAN

Ερώτηση 5.

If no bridge priority is configured in Per VLAN Spanning Tree (PVST), which criteria is considered when electing the root bridge?

- (a) lowest IP address
- (b) highest IP address
- (c) lowest Physical address
- (d) highest Physical address

Ερώτηση 6.

A network administrator is configuring an EtherChannel link between two physical ports on a switch. Which statement describes the result when one of the physical ports fails?

- (a) The EtherChannel link fails.
- (b) An STP recalculation is needed.
- (c) The EtherChannel stops transmitting data until it is restarted.
- (d) The EtherChannel continues transmitting data with reduced bandwidth.

Ερώτηση 7.

Which message does an IPv4 host use to reply when it receives a DHCPOFFER message from a DHCP server?

- (a) DHCPACK
- (b) DHCPDISCOVER
- (c) DHCPOFFER
- (d) DHCPREQUEST

Ερώτηση 8.

What method can be used to generate an interface ID by an IPv6 host that is using SLAAC?

- (a) ARP
- (b) DAD
- (c) stateful DHCP v6
- (d) random generation

Ερώτηση 9.

What is the purpose of HSRP?

- (a) It enables an access port to immediately transition to the forwarding state.
- (b) It provides a continuous network connection when a router fails.
- (c) It prevents malicious hosts from connecting to trunk ports.
- (d) It prevents a rogue switch from becoming the STP root.

Ερώτηση 10.

If a router has four (4) interfaces and routes IPv4 and IPv6 traffic. What is the maximum number of ACLs that can be applied on it?

- (a) 4
- (b) 8
- (c) 12
- (d) 16

Ερώτηση 11.

An administrator who is troubleshooting connectivity issues on a switch notices that a switch port configured for port security is in the err-disabled state. After verifying the cause of the violation, how should the administrator re-enable the port without disrupting network operation?

- (a) Reboot the switch.
- (b) Issue the **no switchport port-security** command, then re-enable port security.
- (c) Issue the shutdown command followed by the no shutdown command on the interface.
- (d) Issue the **no switchport port-security violation shutdown** command on the interface.

Ερώτηση 12.

What is an advantage of static routing over dynamic routing?

- (a) Static routing scales well with expanding networks.
- (b) Static routing requires very little knowledge of the network.
- (c) Static routing is relatively easy to configure for large networks.
- (d) Static routing is more secure because it does not advertise over the network.

Ερώτηση 13.

What type of static route is created when IP address of the next router and exit interface are specified?

- (a) directly connected static route
- (b) fully specified static route
- (c) next-hop static route
- (d) floating static route

Ερώτηση 14.

What will a router do if it does not have a default route configured and a packet needs to be forwarded to a destination network that is not listed in the routing table?

- (a) drop it.
- (b) resend the packet.
- (c) send it back to the source.
- (d) forward it to another router.

Ερώτηση 15.

A static route has been configured on a router. However, the destination network no longer exists. What should an administrator do to remove the static route from the routing table?

- (a) Remove the route using the no ip route command.
- (b) Change the administrative distance for that route.
- (c) Nothing. The static route will go away on its own.
- (d) Change the routing metric for that route.

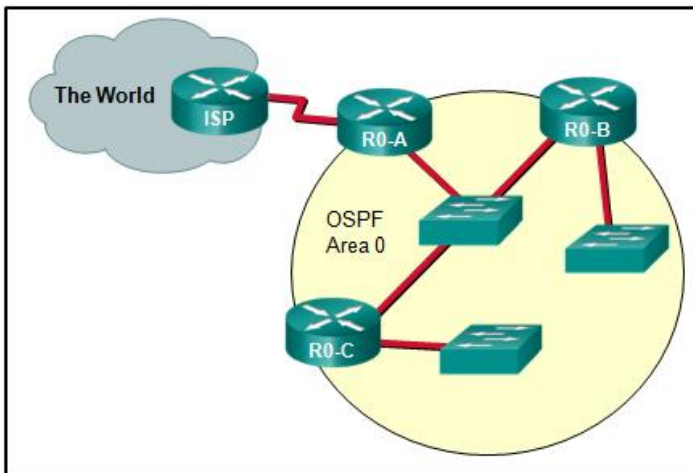
Ερώτηση 16.

What is the format of the router ID on an OSPF-enabled router?

- (a) a character string with no space.
- (b) a 32-bit number formatted like an IPv4 address.
- (c) a unique phrase with no more than 16 characters.
- (d) a unique router host name that is configured on the router.

Ερώτηση 17.

Refer to the exhibit. On which router or routers, a default route **must** be statically configured in a corporate environment that uses single area OSPF as the routing protocol?



- (a) ISP
- (b) R0-A
- (c) ISP and R0-A
- (d) R0-A, R0-B, and R0-C

Ερώτηση 18.

A network engineer issues the **show cdp neighbor command** on several network devices during the process of network documentation. What is the purpose of performing this command?

- (a) to obtain information about directly connected Cisco devices.
- (b) to check the networks that are advertised by the neighboring routers.
- (c) to check the connectivity of PCs that are connected to the network devices.
- (d) to verify the network addresses that are attached to the network devices.

Ερώτηση 19.

A router has used the OSPF protocol to learn a route to the 192.168.2.0/25 network. Which command will implement a backup floating static route to this network?

- (a) ip route 192.16.2.0 255.255.255.128 G0/0/0 25
- (b) ip route 192.168.20.0 255.255.255.128 G0/0/0 25
- (c) ip route 192.168.2.0 255.255.255.128 G0/0/0 128
- (d) ip route 192.168.20.0 255.255.255.28 G0/0/0 255

Ερώτηση 20.

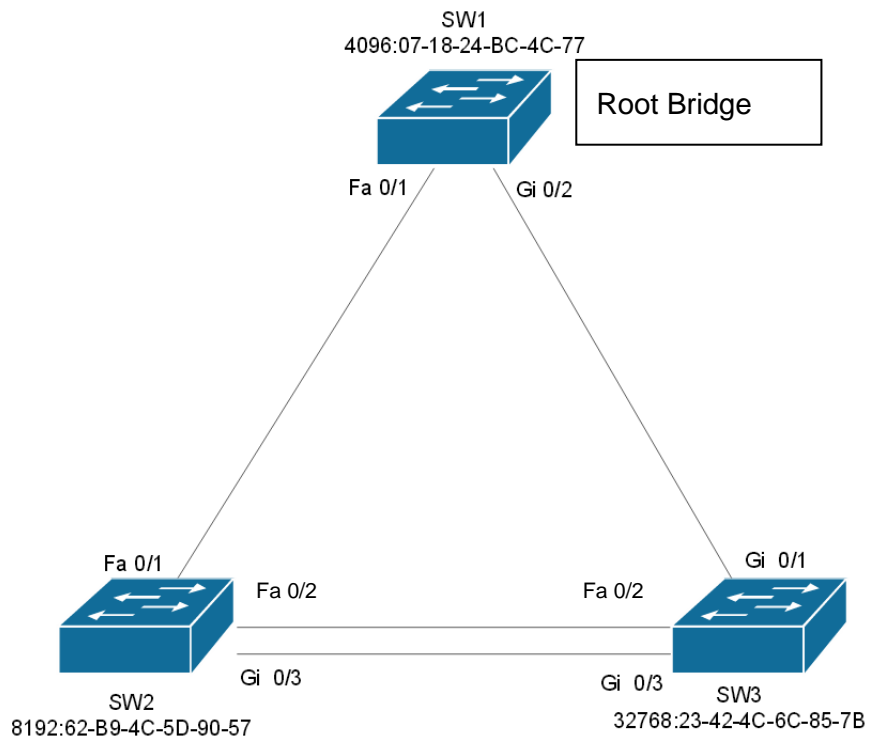
An administrator is configuring single-area OSPF on a router. One of the networks that must be advertised is 192.10.0.0/28. What wildcard mask would the administrator use in the OSPF network statement?

- (a) 0.0.0.7
- (b) 0.0.0.15
- (c) 0.0.0.31
- (d) 0.0.0.63

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

Ερώτηση 1.

The following network topology is given. Fill in the below table by specifying the STP role of each port (**DP**=Designated Port, **RP**=Root Port, **AP/B**=Alternate Port/Blocked).



Switch	Port	Role	Switch	Port	Role
(a) SW2	Fa0/1		(d) SW3	Gi0/1	
(b) SW2	Fa0/2		(e) SW3	Fa0/2	
(c) SW2	Gi0/3		(f) SW3	Gi0/3	

Ερώτηση 2.

For each network specify the corresponding subnet mask and wildcard mask.

Network	Decimal Subnet Mask	Wildcard Mask
(a) 192.168.30.0 /29		
(b) 192.168.64.0 /18		
(c) 192.128.0.0 /12		

Ερώτηση 3.

A network administrator has issued the command **show ip route on a router**. One of the lines in the output is the following:

O 10.0.4.0/24 [110/50] via 10.0.3.2, 00:24:22, Serial0/1/1

Fill in the blanks in the following statements:

- (a) This route was set up using the _____ routing protocol.
- (b) The value 110 is called the _____.
- (c) This route tells the router where to forward packets for network _____.
- (d) The next hop interface address is _____.
- (e) The value 50 is called the _____.
- (f) The exit interface is _____.

Ερώτηση 4.

Six (6) hosts are connected to a switch. Their MAC addresses and the ports of the switch that are connected are shown to the table below. The MAC Table of the switch is also shown. Determine how the switch will forward the frame and answer the following questions.

PC	MAC Address	Port Connected
PC1	0A	F0/1
PC2	0B	F0/3
PC3	0C	F0/5
PC4	0D	F0/7
PC5	0E	F0/8
PC6	0F	F0/9

MAC Table					
F0/1	F0/3	F0/5	F0/7	F0/8	F0/9
	0B				

Frame	
Destination MAC	Source MAC
0E	0F

- Write the ports where the Switch will forward the frame:
- The switch will add the source MAC to the MAC table (YES / NO):
- Frame is a broadcast frame and will be forwarded to all ports (YES / NO):
- Frame is a unicast frame and will be sent to specific port only (YES / NO):
- Frame is a unicast frame and will flooded to all ports except the source port (YES / NO):
- Frame is a unicast frame but will be dropped at the switch (YES / NO):

Ερώτηση 5.

State whether the below statements are True or False.

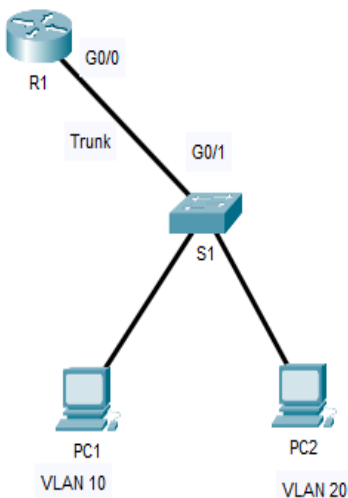
	Statement	True Or False
(a)	One primary benefit of using VLAN design is the smaller broadcast domains.	
(b)	Full duplex communication is when data can flow in only one direction at a time.	
(c)	Spanning Tree Protocol (STP) is a loop-prevention protocol that allows for redundancy while creating a loop-free Layer 2 topology.	
(d)	SSH protocol is less secured than Telnet protocol for remote access.	
(e)	A trunk link is a point-to-point link between two network devices that carries traffic from one VLAN only.	
(f)	EtherChannel technology is a LAN switch-to-switch technique of grouping several Fast Ethernet or Gigabit Ethernet ports into one logical channel.	

ΜΕΡΟΣ Γ (40 Μονάδες)

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

Ερώτηση 1. Α

Consider the following network.



Addressing Table

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway
R1	G0/0.10	172.17.10.1	255.255.255.0	N/A
R1	G0/0.20	172.17.20.1	255.255.255.0	N/A
PC1	NIC	172.17.10.10	255.255.255.0	172.17.10.1
PC2	NIC	172.17.20.10	255.255.255.0	172.17.20.1

Ports	VLAN Number	VLAN Name
Fa0/1-Fa0/10	VLAN 10	Accounting
Fa0/11-Fa0/24	VLAN 20	Programmers

(a) Write the necessary commands on S1 to create VLAN 10 and VLAN 20. Configure the name for VLAN 10 to be Accounting and the name of VLAN 20 to be Programmers. Assign the appropriate ports to VLAN 10 and VLAN 20 and change the switchport mode accordingly. (5 pts)

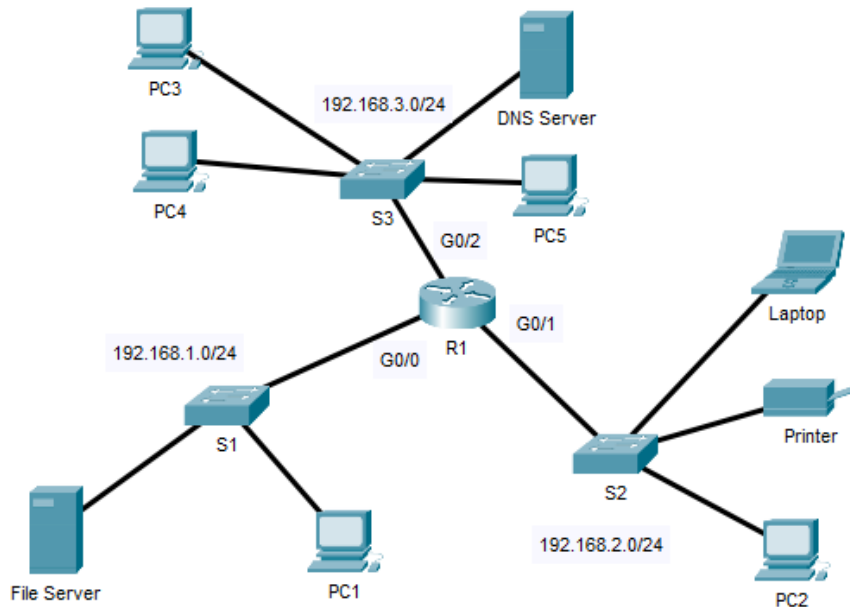
(b) Configure port G0/1 on S1 for trunking.

(1 pts)

(c) Configure sub-interfaces on R1 using the 802.1Q encapsulation in order to achieve communication between VLAN 10 and VLAN 20. Activate the interfaces as needed. Subinterfaces name should match the VLAN number. (4 pts)

Ερώτηση 1. Β

You have been asked to secure a network with standard ACLs and DHCP Service. The topology and all relevant details are show below. Follow the instructions to implement the solution.



Addressing Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
R1	G0/0	192.168.1.1	255.255.255.0	N/A
	G0/1	192.168.2.1	255.255.255.0	N/A
	G0/2	192.168.3.1	255.255.255.0	N/A
PC1	NIC	192.168.1.10	255.255.255.0	192.168.1.1
File Server	NIC	192.168.1.11	255.255.255.0	192.168.1.1
PC2	NIC	192.168.2.10	255.255.255.0	192.168.2.1
Laptop	NIC	192.168.2.11	255.255.255.0	192.168.2.1
Printer	NIC	192.168.2.240	255.255.255.0	192.168.2.1
PC3	NIC	192.168.3.10	255.255.255.0	192.168.3.1
PC4	NIC	192.168.3.20	255.255.255.0	192.168.3.1
PC5	NIC	DHCP Assigned	DHCP Assigned	DHCP Assigned
DNS Server	NIC	192.168.3.5	255.255.255.0	192.168.3.1

(a) Configure the numbered standard ACL 10.

The ACL should block all traffic from network 192.168.3.0/24 to network 192.168.1.0/24 where File Server is located. All other traffic to 192.168.1.0 network should be allowed.

Place the ACL on the right interface and direction. (2 pts)

(b) Configure the numbered standard ACL 20.

The ACL should deny Laptop from accessing any remote network. All other traffic from network 192.168.2.0 should be allowed. Place the ACL on the right interface and direction.

(2 pts)

(c) Configure the numbered standard ACL 30.

The ACL should block PC1 and PC3 from accessing network 192.168.2.0/24. All other traffic to 192.168.2.0/24 network should be allowed. Place the ACL on the right interface and direction. (2,5 pts)

(d) Verify the ACLs.

From the **right mode** on R1, verify that the access lists are configured correctly. (1 pts)

R1(config-if)#

(e) Configure R1 to act as DHCPv4 Server for 192.168.3.0 network.

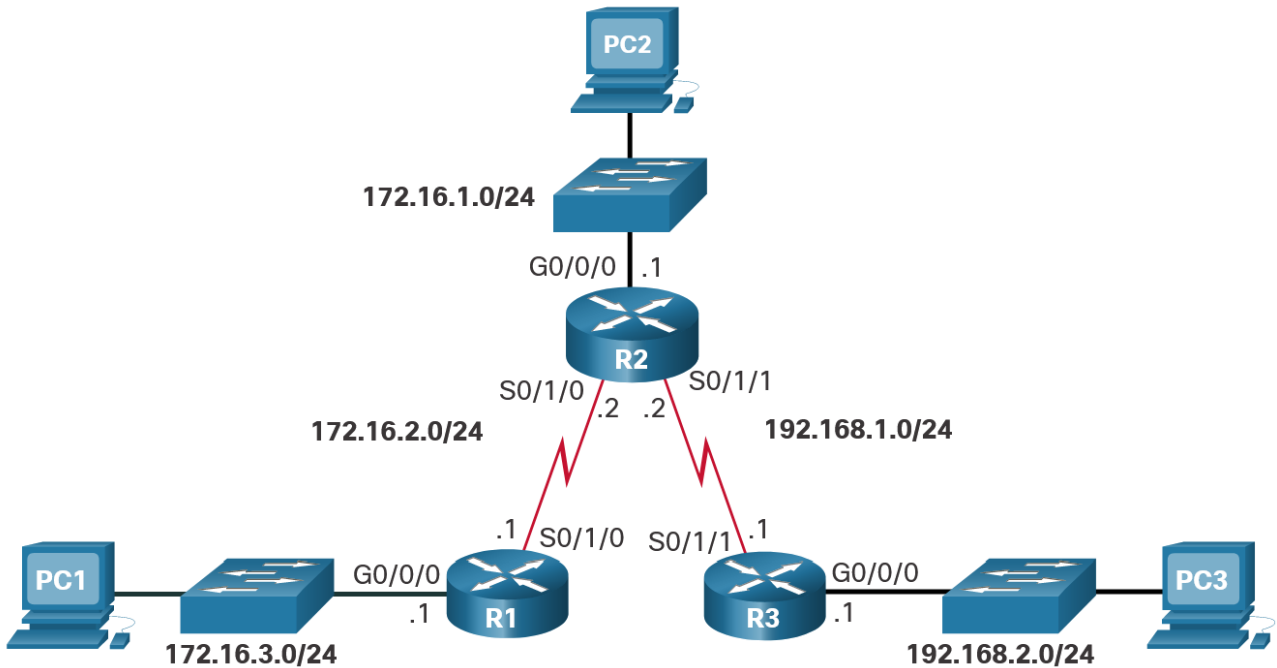
(2,5 pts)

1. Exclude addresses from 192.168.3.1 till 192.168.3.20.
2. Define the pool name as LAN3-POOL.
3. Specify the network that DHCP is supporting (192.168.3.0/24).
4. Configure the default gateway address (192.168.3.1).
5. Configure the DNS server address (192.168.3.5).

Ερώτηση 2. Α

You have been tasked to configure a network with static IPv4 routing configuration. The network topology and Addressing table are given below. Follow the instructions provided.

Network Topology



Addressing Table

Device	Interface	IPv4 Address	Subnet Mask
R1	G0/0/0	172.16.3.1	255.255.255.0
	S0/1/0	172.16.2.1	255.255.255.0
R2	G0/0/0	172.16.1.1	255.255.255.0
	S0/1/1	192.168.1.2	255.255.255.0
R3	G0/0/0	192.168.2.1	255.255.255.0
	S0/1/1	192.168.1.1	255.255.255.0

(a) Configure recursive (next-hop) static route for every remote network of R1. (3 pts)

R1(config)#

(b) Configure directly connected static routes for every remote network of R2. (2 pts)

R2(config)#

(c) Configure a fully specified static route on R3 for R1 LAN. (1 pts)

R3(config)#

(d) Configure a fully specified default route on R3 for the rest unknown remote networks.

(1 pts)

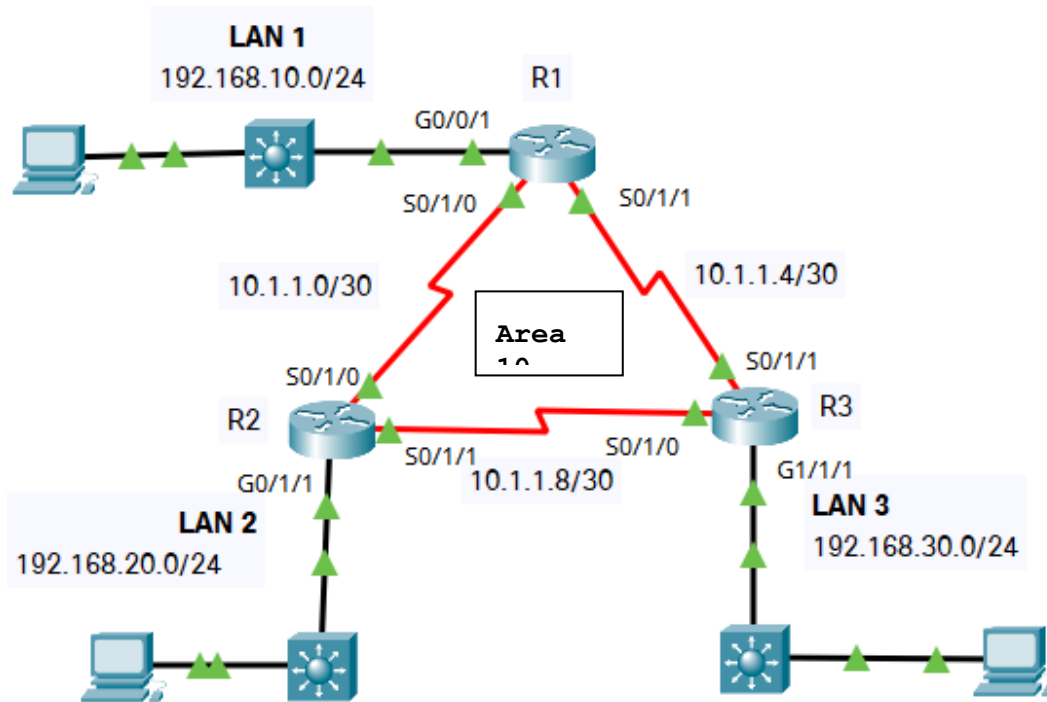
R3(config)#

(e) Write the commands to exit the configuration mode and to display the routes in the routing table. (2 pts)

(f) Verify connectivity from R1 to the LAN interface of R3. (1 pts)

Ερώτηση 2. Β

You have been asked to configure a network with dynamic routing using OSPFv2. The network topology and the addressing table are given below. Assume that all interfaces are properly configured.



Addressing Table

Device	Interface	IP Address	Prefix Notation
R1	G0/0/1	192.168.10.1	/24
	S0/1/0	10.1.1.1	/30
	S0/1/1	10.1.1.5	/30
R2	G0/1/1	192.168.20.1	/24
	S0/1/0	10.1.1.2	/30
	S0/1/1	10.1.1.9	/30
R3	G1/1/1	192.168.30.1	/24
	S0/1/0	10.1.1.10	/30
	S0/1/1	10.1.1.6	/30

A) Use the following requirements to configure OSPFv2 dynamic routing on router R1:

- Process ID 30
 - Router ID for R1 = 1.1.1.1
 - Network address and appropriate network wildcard mask for each interface
 - LAN interface set to passive (4pts)
- R1>

B) Use the following requirements to configure OSPFv2 dynamic routing on router R2:

- Process ID 30
- Router ID for R2 = 2.2.2.2
- Network address and appropriate network wildcard mask for each interface
- LAN interface set to passive (3pts)

R2(config)#

C) Use the following requirements to configure OSPFv2 dynamic routing on router R3:

- Process ID 30
- Router ID for R2 = 3.3.3.3
- Network address and appropriate network wildcard mask for each interface
- LAN interface set to passive (3pts)

R3(config)#

ΣΤΟ ΔΕΙΓΜΑΤΙΚΟ ΔΟΚΙΜΙΟ ΠΕΡΙΛΑΜΒΑΝΟΝΤΑΙ ΕΡΩΤΗΣΕΙΣ/ΑΣΚΗΣΕΙΣ ΑΠΟ ΟΛΗ ΤΗΝ ΔΙΔΑΚΤΕΑ ΥΛΗ, ΟΠΩΣ ΑΥΤΗ ΕΧΕΙ ΚΑΘΟΡΙΣΤΕΙ ΣΤΑ ΠΛΑΙΣΙΑ ΜΑΘΗΣΗΣ. Η ΕΞΕΤΑΣΤΕΑ ΥΛΗ ΘΑ ΑΝΑΚΟΙΝΩΘΕΙ ΣΕ ΜΕΤΑΓΕΝΕΣΤΕΡΟ ΣΤΑΔΙΟ.