University of Larbi Ben M'hidi
2024-2025

Exam in Networks 3

Responsible:
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Name :	Group :

Questions of understanding (7.5 points, -0.25 for the wrong answer): Choose the correct answer(s):

1. VLAN segmentation involves:

□ Combining multiple networks into one □ Physically separating network devices

□ Dividing a single physical network into multiple logical networks

2. What is the purpose of VLAN trunking?

□ To encrypt VLAN data □ To carry traffic for multiple VLANs over a single link.

□ To connect VLANs across different physical locations

3. What is the primary function of a router in a network?

□ Forwarding data packets between devices within the same network segment.

□ Filtering network traffic based on IP addresses.

□ Connecting multiple networks together and forwarding data between them.

□ Providing wireless access to network devices.

4. Which of the following is NOT a type of routing protocol ?

□ Static routing □ Dynamic routing □ Link-state routing □ Broadcast routing

5. We use an algorithm in dynamic routing to :

□ Determine the best path determination

□ discover neighbors and exchange the routing information

□ specify the preference of a particular route

6. Which two (2) statements describe the OSPF protocol?

□ automatically summarizes networks at the classful boundaries

□ calculates its metric using bandwidth □has an administrative distance of 100 □ uses Dijkstra's algorithm to build the SPF tree

7. The OSPF protocol is an intra-domain routing protocol based on …….. routing

□ Distance Vector □link state □ path vector

8. RIP stands from :

□ Routing Information Protocol □ Routing Internet Protocol

□ Reverse Interior Protocol □ Run Information Protocol

9. Which type of routing protocol typically exchanges routing information between routers within the same autonomous system (AS)?

□ Interior Gateway Protocol (IGP) □ Exterior Gateway Protocol (EGP)

□ Border Gateway Protocol (BGP) □ Static Routing Protocol

10. What is the purpose of the Internet Assigned Numbers Authority (IANA) with respect to Autonomous Systems?

□ To assign IP addresses to Autonomous Systems

□ To regulate the use of routing protocols within Autonomous Systems

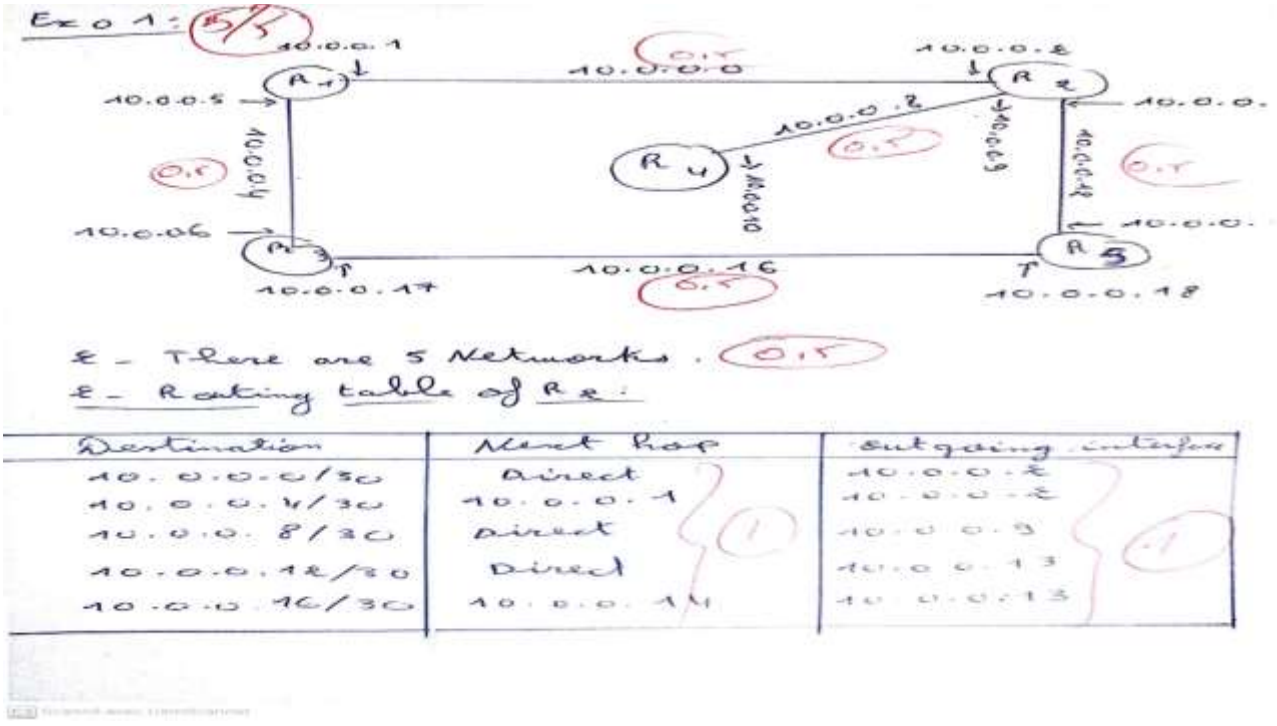
□ To manage routing policies between Autonomous Systems

□ To allocate Autonomous System Numbers (ASNs)

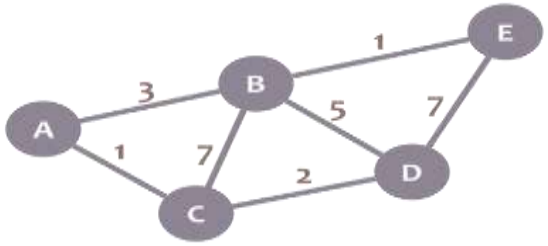
Exercise 01 (5 points): Consider a small network consisting of five routers (R1, R2, R3, R4, and R5) interconnected as follows:

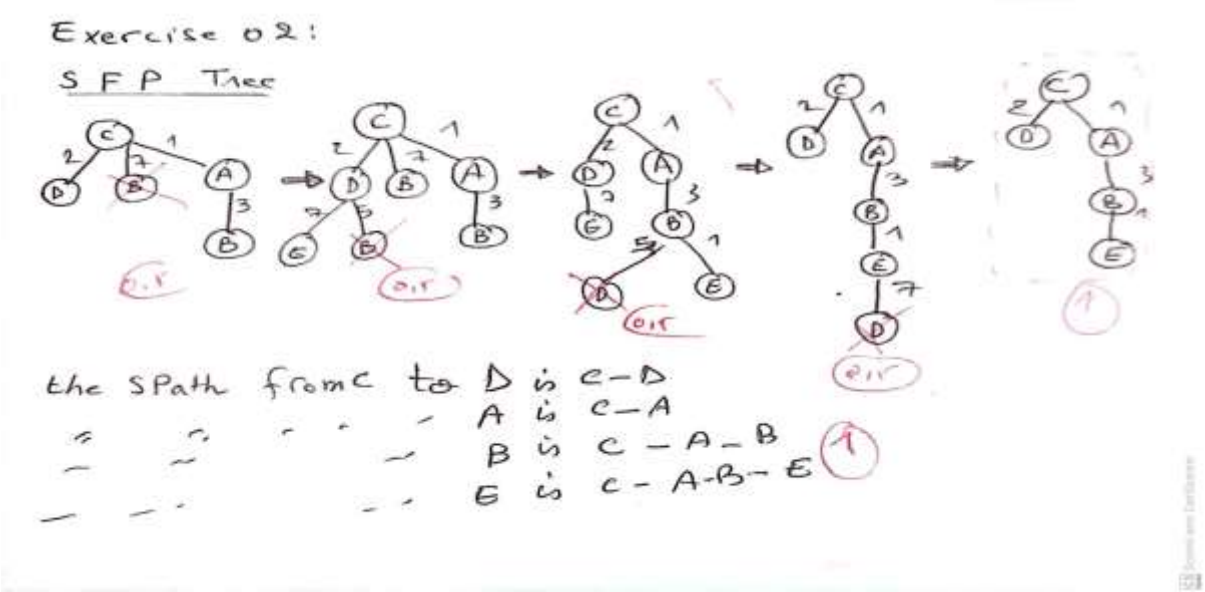
• R1 is connected to R2 and R3. • R2 is connected to R1, R4, and R5. • R3 is connected to R1 and R5. • R4 is connected to R2. • R5 is connected to R2 and R3.	Using the following IP addresses for the router interfaces: • R1-R2 link: 10.0.0.1/30 (R1) and 10.0.0.2/30 (R2) • R1-R3 link: 10.0.0.5/30 (R1) and 10.0.0.6/30 (R3) • R2-R4 link: 10.0.0.9/30 (R2) and 10.0.0.10/30 (R4) • R2-R5 link: 10.0.0.13/30 (R2) and 10.0.0.14/30 (R5) • R3-R5 link: 10.0.0.17/30 (R3) and 10.0.0.18/30 (R5)

1. Give the corresponding topology of the networks specifying the IP addresses of the different networks and the IP address of each router interfaces.
2. How many networks are in this topology
3. Determine the routing table of R2



Exercice 02 (4 points): applying the Dijkstra Algorithm, calculate the shortest path from the C node to other nodes. Illustrate by the Shortest **Path Tree**. (give all steps in detail)





Exercice 03 (4 points): complete the table below:

Protocol	RIP	OSPF
AD	**120**	**110**
Maximum routers in the network.	**15**	**unlimited**
Metric	**Hop Count**	**bandwidth**
Algorithm	**Bellman Ford**	**Djikstra**
Protocol type	**Distance vector**	**Link State**