Name _____ Date _____

Module 1 - Single-Area OSPFv2 Concepts
Enterprise Networking, Security, and Automation– Semester 3
Student Version

Module 1 Sections:

Required Materials:

Reading Organizer

Packet Tracer Activities: None

Labs: None

Module's 1 - 2 Exam

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Name_____ Date _____

Module 1 - Single-Area OSPFv2 Concepts
Reading Organizer
Instructor Version

Note: The Reading Organizer has weighted scoring. Any question with the word **explain**, **define, or describe** in it is expected to have a longer answer and is worth two points each.

After completion of this module, you should be able to:

- Describe basic OSPF features and characteristics.
- Describe the OSPF packet types used in single-area OSPF.
- Explain how single-area OSPF operates.

1.1 OSPF Features and Characteristics

1. Open Shortest Path First (OSPF) includes _____ and _____

2. _____ is used for IPv4 networks, and _____is used for IPv6 networks.

3. OSPF is a _____ routing protocol that was developed as an alternative for the distance vector Routing Information Protocol (RIP).

4. OSPF is a link-state routing protocol that uses the concept of _____.

5. A network administrator can divide the routing domain into distinct _____ that help control routing update traffic.

6. Routers running OSPF exchange messages to convey routing information using five types of packets. List the packets below.

    a.

    b.

    c.

    d.

    e.

7. What are two things OSPF packets are designed to discover?

    a.

    b.

8. List and describe the three databases OSPF messages are used to create and maintain.

    a. _____ -

    b. _____ -

    c. _____ -

9. In OSPF,_____ is used to determine the best path to the destination.

10. List the link-state routing steps that are completed by a router.

    a.

    b.

    c.

    d.

    e.

11. To make OSPF more efficient and scalable, OSPF supports hierarchical routing using areas. Explain what areas are.

12. List and describe the two ways OSPF can be implemented.

    a. _____ -

    b. _____ -

13. What three things happen any time a router receives new information about a topology change within the area (including the addition, deletion, or modification of a link)?

    a.

    b.

    c.

14. List and explain the advantages offered by using hierarchical-topology design options with multiarea OSPF.

    a. _____ -

    b. _____ -

    c. _____ -

15. How does OSPFv3 differ from OSPFv2?

1.2 OSPF Packets

16. Link-state packets are the tools used by OSPF to help determine the fastest available route for a packet. List and describe the five link-state packets (LSPs) used to establish and maintain neighbor adjacencies and exchange routing updates.

    a. <u>Type 1:</u> _____ -

    b. <u>Type 2:</u> _____ -

    c. <u>Type 3:</u> _____ -

    d. <u>Type 4:</u> _____ -

    e. <u>Type 5:</u> _____ -

17. Routers initially exchange _____ packets, which is an abbreviated list of the LSDB of the sending router.

18. What is the difference between LSU and LSA?

19. The OSPF Type 1 packet is the Hello packet. Explain what Hello packets are used to do.

    a.

    b.

    c.

1.3 OSPF Operation

20. List what happens when an OSPF router is initially connected to a network.

    a.

b.

c.

d.

21. Fill in the table details showing the states OSPF progresses through while attempting to reach convergence.

State	Description
Down State	a. b. c.
Init State	a. b. c.
Two-Way State	a. b. c.
ExStart State	a.
Exchange State	a. b.
Loading State	a. b. c.
Full State	a.

22. When OSPF is enabled on an interface, the router must determine if there is another OSPF neighbor on the link. To accomplish this, the router sends a _____ that contains its _____ out all OSPF-enabled interfaces.

23. What does a router do when a neighboring OSPF-enabled router receives a Hello packet with a router ID that is not within its neighbor list?

24. List the steps involved in the process routers use to establish adjacency on a multiaccess network.

    1.

    2.

    3.

    4.

25. After the Two-Way state, routers transition to database synchronization states. While the Hello packet was used to establish neighbor adjacencies, the other four types of OSPF packets are used during the process of exchanging and synchronizing LSDBs. List the three step process routers use to complete this.

    a.

    b.

    c.

26. Multiaccess networks can create two challenges for OSPF regarding the flooding of LSAs. List and explain both.

    a. _____ -

    b. _____ -

27. OSPF elects a DR to be the _____and _____ point for LSAs sent and received.

28. What is a DROTHER?