Name _____ Date _____

Chapter 8 – IP Addressing
Study Guide

Tips for success: While answering the questions read Chapter 8, review the summary, and complete the practice Quiz. It is also important to complete conversions without a calculator. Calculators are not allowed on the CCNA certification.

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

- Describe the structure of an IPv4 address.
- Describe the purpose of the subnet mask.
- Compare the characteristics and uses of the unicast, broadcast and multicast IPv4 addresses.
- Explain the need for IPv6 addressing.
- Describe the representation of an IPv6 address.
- Describe types of IPv6 network addresses.
- Configure global unicast addresses.
- Describe multicast addresses.
- Describe the role of ICMP in an IP network (include IPv4 and IPv6)
- Use ping and traceroute utilities to test network connectivity

1. Compare and Contrast

IPv4 Address	IPv6 Address

2. Convert the binary values to decimal:
    a. 00011111 =
    b. 10100011 =
    c. 01110001 =
3. Complete Activity 8.1.1.4 – Binary to Decimal Conversions
4. Convert the decimal values to binary:
    a. 101 =
    b. 237 =
    c. 56 =
5. Complete Activity 8.1.1.7 – Decimal to Binary Conversions
6. The Binary Game – 8.1.1.8 (play to increase speed)
7. What is the purpose of the subnet mask?
8. Write the subnet masks below using the prefix length notation (/?):

a. 255.255.255.128 =
b. 255.255.252.0 =
c. 255.255.255.248 =

9. Use ANDing to determine what network each host is on. Tip: you'll have to convert the values to binary first:
   a. IP: 200.10.57.91 SM: 255.255.255.224 Network = _____
   b. IP: 172.16.32.10 SM: 255.255.224.0 Network = _____
10. Complete Activity 8.1.2.9 – ANDing to Determine the Network Address
11. What is the difference between a limited broadcast and a directed broadcast?

12. Complete Activity 8.1.3.6 – Unicast, Broadcast, or Multicast
13. Determine if the addresses below are Host Addresses, Network Addresses, or Broadcast Addresses:

IP Address with Subnet Mask notation	**Host, Network, or Broadcast**
192.168.1.32/27	
200.25.36.200/25	
172.16.55.71/29	
10.2.3.75/28	

14. Complete Activity 8.1.3.7 – Calculate the Network, Broadcast, and Host Addresses
15. What are Private IP Addresses? List the three ranges of Private addresses:

16. Complete Activity 8.1.4.2 – Pass or Block IPv4 Addresses
17. Fill in the table below:

Address Class	**1st Octet Range**	**Network and Host parts of an Address**	**Default Subnet Mask**	**Number of possible networks and hosts per network**
Class A				
Class B				
Class C				
Class D				
Class E				

18. List the 3 migration techniques for IPv4 to IPv6:

19. Complete Activity 8.2.1.3 – IPv4 Issues and Solutions
20. What are two ways to shorten the length of an IPv6 address without changing its value?

21. Complete Activity 8.2.2.5 – Practicing IPv6 Address Representation
22. What is the range for an IPv6 link local address?
23. Complete Activity 8.2.3.5 – Identify Types of IPv6 Addresses
24. What two show commands can be used to verify IPv6 Address settings?

25. List the 4 ICMP messages common to both ICMPv4 and ICMPv6:
    a.
    b.
    c.
    d.
26. What is a Neighbor Solicitation (NS) message used for?

27. What can be determined with the PING command?

28. What can be determined with the TRACERT command?