4.1.9 Practice Questions

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Date: 2/10/2025, 10:15:32 AM • **Time Spent:** 01:39

Score: 100%

Passing Score: 80%

Question 1. ✓ Correct

What is the decimal format of the following binary IP address?

11001110.00111010.10101010.01000011

→ ◉ 206.58.170.67

○ 190.42.154.51

○ 238.90.202.99

○ 205.57.169.66

Explanation

The decimal equivalent of the 11001110.00111010.10101010.01000011 IP address is 206.58.170.67. To convert from binary to decimal, use the decimal equivalent of the following binary numbers:

- 10000000: 128
- 01000000: 64
- 00100000: 32
- 00010000: 16
- 00001000: 8
- 00000100: 4
- 00000010: 2
- 00000001: 1

To find the decimal form of a binary number, add up each decimal equivalent for each 1 bit in the address. For example, the equation for the number 11001110 is 128 + 64 + 8 + 4 + 2 = 206.

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Question 2. ✓ Correct

What is the correct binary form of the decimal IP address 192.168.1.1?

- 00001010.10101000.00000001.00000001
- 11000000.10101000.00000010.00000001
- 10101100.00010001.00000001.00000001
- → 11000000.10101000.00000001.00000001

Explanation

The decimal equivalent of the 11000000.10101000.00000001.00000001 IP address is 192.168.1.1. To convert from binary to decimal, use the decimal equivalent of the following binary numbers:

- 10000000: 128
- 01000000: 64
- 00100000: 32
- 00010000: 16
- 00001000: 8
- 00000100: 4
- 00000010: 2
- 00000001: 1

For each bit position with a 1 value in the binary form of the address, add the decimal values for that bit. For example, the decimal equivalent of 11000000 is: 128 + 64 + 0 + 0 + 0 + 0 + 0 + 0 = 192

The decimal equivalent of 10101100.00010001.00000001.00000001 is 172.17.1.1.

The decimal equivalent of 00001010.10101000.00000001.00000001 is 10.168.1.1.

The decimal equivalent of 11000000.10101000.00000010.00000001 is 192.168.2.1.

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Question 3.

✓ Correct

Match each decimal value on the left with the corresponding hexadecimal value on the right. Not all decimal values have a corresponding hexadecimal value.

11

✓ 17

B

✓ 11

D

✓ 13

F

✓ 15

C

✓ 12

10

✓ 16

Explanation

Hexadecimal is a Base 16 numbering system, which means there are 16 characters possible for each number place. These characters go from 0 to 9, as decimal does; however, hexadecimal uses the letter A to represent the decimal number 10, B to represent 11, and so on up to F, which represents 15. The easiest way to convert between decimal and hexadecimal is to memorize the corresponding values for each hexadecimal number using the following tables.

Hex Value	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal Value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Hex Value	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
Decimal Value	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

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Question 4. ✓ Correct

Which of the following are valid IP addresses? (Select three.)

- [ ] 137.65.256.1
- [ ] 256.1.1.1
- [x] 172.17.1.3
- [x] 137.65.1.1
- [ ] 137.65.1.257
- [x] 224.0.0.1
- [ ] 10.256.1.1

Explanation

An IPv4 address is a 32-bit binary number represented as four octets (four 8-bit values). Each octet is separated by a period. Because each octet is 8 bits long, the smallest possible decimal value for a single octet is 0, while the largest possible decimal value is 255. In this example, the following are valid IP addresses:

- 137.65.1.1
- 172.17.1.3
- 224.0.0.1

The other addresses are not valid because they contain values larger than 255.

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Question 5. ✓ Correct

A workstation has been assigned the following IP addressing information:

- IP address: 192.168.1.26
- Subnet mask: 255.255.255.0
- Default gateway: 192.168.1.254
- DNS server: 192.168.1.1

Given this information, what is the network IP address of this workstation?

- 192.0.0.0
- 192.168.0.0
- → 192.168.1.0
- 192.168.1.255

Explanation

The IP address includes both the network and the host address. The subnet mask is a 32-bit number associated with each IP address that identifies the network portion of the address. In binary form, the subnet mask is always a series of 1s followed by a series of 0s (1s and 0s are never mixed in sequence in the mask). In this example, the decimal form of the subnet mask is 255.255.255.0. This specifies that the network address in this example is 192.168.1.0

192.168.1.255 is the broadcast address for this network.

A network address of 192.168.0.0 would require a subnet mask of 255.255.0.0.

A network address of 192.0.0.0 would require a subnet mask of 255.0.0.0.

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Question 6. ✓ Correct

A network host has an IP address of 137.65.1.2 assigned to it. Given that the network uses the default classful subnet mask, what is the default routing prefix for this address using CIDR subnet mask notation?

→ ◉ /16

○ /24

○ /32

○ /8

Explanation

Because 137.65.1.2 falls within the range of 128.0.0.0 to 191.255.255.255, it is a class B address and uses a default subnet mask of 255.255.0.0. Therefore, the default routing prefix is /16.

/8 is the default routing prefix for class A IP addresses, while /24 is the default routing prefix for class C IP addresses. A default routing prefix of /32 would use all available bits in an IPv4 address for the network address, leaving no host addresses available.

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Question 7. ✓ Correct

Your network uses a network address of 137.65.0.0 with a subnet mask of 255.255.0.0.

How many IP addresses are available for assignment to network hosts on this network?

→ ◉ 65534

○ 254

○ 16777214

○ 2

Explanation

Given a network address and subnet mask, you can have 2 to the *n*th power - 2 hosts per subnet. Begin by converting the subnet mask to a binary number. To find the number of valid hosts, n = the number of unmasked bits in the mask. In this example, there are 16 unmasked bits in the mask. Therefore, the number of available hosts is 2 to the 16th power - 2, which equals 65534.

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Question 8. ✓ Correct

Which of the following IP addresses is a valid IP address for a host on a public network?

- 172.16.254.12
- → 142.15.6.1
- 192.168.16.45
- 10.3.125.2

Explanation

A public network is a network that does not limit traffic to members of a corporation or other group. The internet is an example of a public network. Certain sets of IP addresses are reserved for private networks only and cannot be used on public networks. They are:

- 10.0.0.0 - 10.255.255.255
- 172.16.0.0 - 172.31.255.255
- 192.168.0.0 - 192.168.255.255

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Question 9. ✓ Correct

Which of the following are private IP addresses? (Select two.)

- [ ] 198.162.1.12
- [x] 192.168.250.11
- [ ] 127.99.1.155
- [x] 10.244.12.16
- [ ] 172.32.119.199

Explanation

10.244.12.16 and 192.168.250.11 are private IP addresses. Private addresses fall within the following range:

- 10.0.0.0 to 10.255.255.255
- 172.16.0.0 to 172.31.255.255
- 192.168.0.0 to 192.168.255.255

Private addresses are used only within a private network and cannot be used on the internet. A service such as Network Address Translation (NAT) is required to translate private addresses into public addresses.

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Question 10. ✓ Correct

Which of the following devices is most likely to be assigned a public IP address?

- A workstation on your company network that has internet access.
- A database server used by your company's website for storing customer information.
- A router on your company network that segments your LAN into two subnets.
- → A router that connects your home network to the internet.

Explanation

To connect a private network, home or business to the internet, you must have a router with a public IP address. The public address allows hosts on the internet to send packets to the router.

When you connect a private network to the internet, only the router interface connected to the internet needs a public address. You can then use Network Address Translation (NAT) and assign private addresses to hosts on your private network (including all routers on the private network). The NAT router translates your private addresses into the public address.

You can even use NAT to place publicly available hosts, such as web servers, on the private network (although these servers are often placed in a special subnet connected to the internet and assigned public addresses). With port address translation, incoming messages sent to the publicly available servers are relayed to the private network. Servers that hold confidential data, such as database servers, are normally placed on the private network, and can only be contacted directly by the necessary devices (such as a web server).

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