

# IP AND SUBNETTING EXERCISES

## **1. Write the subnet, broadcast address and valid host range for the following:**

a. 192.168.100.17, with 4 bits of subnetting

11000000.10101000.01100100.00010001/24

11111111.11111111.11111111.11110000

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11000000.10101000.01100100.0001|0001 → 192.168.100.17 - 192.168.100.30 Valid host range

11000000.10101000.01100100.0001|1111 → 192.168.100.31 broadcast

11000000.10101000.01100100.0001|0000 → 192.168.100.16 Subnet of 4 bits/28

b. 192.168.100.66, with 3 bits of subnetting

11000000.10101000.01100100.01000010

11111111.11111111.11111111.00000000

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11000000.10101000.01100100.010|00001 → 192.168.100.65 - 192.168.100.94 Valid host range

11000000.10101000.01100100.110|11111 → 192.168.100.95 broadcast

11000000.10101000.01100100.010|00000 → 192.168.100.64 Subnet of 3 bits /27

c. 172.16.10.5/20

10101100.00010000.00001010.00000101

11111111.11111111.11110000.00000000

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10101100.00100000.00000000.00000001 → 172.16.0.1 - 172.16.15.254 Valid host range

10101100.00100000.00001111.11111111 → 172.16.15.255 broadcast

10101100.00010000.00000000.00000000 → 172.16.0.0 Subnet /21

d. 172.16.10.33/255.255.252.0

10101100.00010000.00001010.00000101

11111111.11111111.11111100.00000000

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10101100.00100000.00001000.00000000 → 172.16.8.1 - 171.16.11.254 Valid host range

10101100.00100000.00000011.11111111 → 172.16.8..255 broadcast

10101100.00010000.00001000.00000000/23 → 172.16.8.0 Subent /23

### **3. Given the following information:**

a. Network address: 192.168.10.0

b. Subnet mask: 255.255.255.192

How many subnets are there? How many hosts? What are the valid subnets?

11000000.10101000.00001010.00|000000

11111111.11111111.11111111.11|000000

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**1st subnet**

11000000.10101000.00001010.00000000 → 192.168.10.0/26

11000000.10101000.00001010.00111111 → 192.168.10.63 Broadcast

11000000.10101000.00001010.00000001 → 192.168.10.1 - 192.168.10.62 Valid host range

#### **2nd subnet**

11000000.10101000.00001010.01000000 → 192.168.0.64/26

11000000.10101000.00001010.01111111 → 192.168.10.127 Broadcast

11000000.10101000.00001010.01000001 → 192.168.10.65 - 192.168.10.126 Valid host range

#### **3rd subnet**

11000000.10101000.00001010.10000000 → 192.168.10.128/26

11000000.10101000.00001010.10111111 → 192.168.10.191 Broadcast

11000000.10101000.00001010.10000001 → 192.168.10.129 - 192.168.10.190 Valid host range

#### **4th subnet**

11000000.10101000.00001010.11000000 → 192.168.10.192/26

11000000.10101000.00001010.11111111 → 192.168.10.255 Broadcast

11000000.10101000.00001010.11000011 → 192.168.10.193 - 192.168.10.254 Valid host range

**5. XYZ Company would like to subnet its network so that there are five separate subnets. They will need 25 computers in each subnet. Complete the following table: NOTE: If you create more than five subnets, list the extra ones too.**

- a. Network address: 192.168.162.0/27
- b. Subnet mask: 255.255.255.224

11000000.10101000.10100010.000|00000

11111111.11111111.11111111.111|00000 //000\*-001\*-010\*-100\*-011\*-101\*-110\*-111\*

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**1st subnet**

11000000.10101000.00001010.00000000 → 192.168.162.00/27

11000000.10101000.00001010.00011111 → 192.168.162.31 Broadcast

11000000.10101000.00001010.00000001 → 192.168.162.1 - 192.168.162.30 Valid host range

**2nd subnet**

11000000.10101000.00001010.00100000 → 192.168.162.32/27

11000000.10101000.00001010.00111111 → 192.168.162.63 Broadcast

11000000.10101000.00001010.00010001 → 192.168.162.33 - 192.168.162.62 Valid host range

**3rd subnet**

11000000.10101000.00001010.01000000 → 192.168.162.64/27

11000000.10101000.00001010.01011111 → 192.168.162.95 Broadcast

11000000.10101000.00001010.01000001 → 192.168.162.65 - 192.168.162.94 Valid host range

**4th subnet**

11000000.10101000.00001010.10000000 → 192.168.162.128/27

11000000.10101000.00001010.10011111 → 192.168.162.159 Broadcast

11000000.10101000.00001010.10000001 → 192.168.162.129- 192.168.162.253 Valid host range

**5th subnet**

11000000.10101000.00001010.01100000 → 192.168.162.96/27

11000000.10101000.00001010.01111111 → 192.168.162.127 Broadcast

11000000.10101000.00001010.00000001 → 192.168.162.97- 192.168.162.126 Valid host range

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#### **6th subnet**

11000000.10101000.00001010.10100000 → 192.168.162.160/27

11000000.10101000.00001010.10111111 → 192.168.162.191 Broadcast

11000000.10101000.00001010.00000001 → 192.168.162.161- 192.168.162.190 Valid host range

#### **7th subnet**

11000000.10101000.00001010.11000000 → 192.168.162.192/27

11000000.10101000.00001010.11011111 → 192.168.162.223 Broadcast

11000000.10101000.00001010.00000001 → 192.168.162.193- 192.168.162.222 Valid host range

#### **8th subnet**

11000000.10101000.00001010.11100000 → 192.168.162.224/27

11000000.10101000.00001010.11111111 → 192.168.162.255 Broadcast

11000000.10101000.00001010.00000001 → 192.168.162.225- 192.168.162.254 Valid host range