**Question 1:** **[20 points]**

Subnet the network address of “192.168.10.0” by using a subnet mask (255.255.255.192) or a CIDR value of 192.168.10.0/26, and then answer the following questions accordingly.

1. How many subnets? Use a formula or justify your answer to show the total number of subnets.

[2 Points]

Total subnets are equal to 2^x where x= number of mask bits, while the CIDR value /26 means that the last octet of this IP is 11000000.

So, total subnets= 2^2 = 4

1. How many valid/usable hosts per subnet? Use a formula or justify your answer to show the total number of valid/usable hosts per subnets.

[2 Points]

Total valid/usable hosts per subnet= 2^y-2, where y= number of zero bits, while the CIDR value /26 means that the last octet of this IP is 11000000.

So, total hosts per subnet= 2^6-2 = 62

1. What are the valid subnets? List down the Network addresses of each subnet.

[2 Points]

As block size= 256-192 = 64.

Subnet1 IP: 192.168.10.0

Subnet2 IP: 192.168.10.64

Subnet3 IP: 192.168.10.128

Subnet4 IP: 192.168.10.192

1. What is the broadcast address for each subnet?

[2 Points]

BA1 IP: 192.168.10.63

BA2 IP: 192.168.10.127

BA3 IP: 192.168.10.191

BA4 IP: 192.168.10.255

1. What are the valid hosts? List down the first and last two IP addresses from the range of the valid hosts in each subnet. [12 Points]

|  |  |
| --- | --- |
| IP address of Subnet#1\_\_\_:  First valid/usable host IP: \_\_192.168.10.1\_\_\_\_  Second valid/usable host IP: \_\_192.168.10.2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  -------------------------  Second last valid/usable host IP: \_\_192.168.10.61\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Last valid/usable host IP: \_\_\_\_\_\_\_\_\_192.168.10.62\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |
| IP address of Subnet\_#2\_:  First valid/usable host IP: \_\_\_\_192.168.10.65\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Second valid/usable host IP: \_\_192.168.10.66\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  -------------------------  Second last valid/usable host IP: \_192.168.10.125\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Last valid/usable host IP: \_\_\_\_\_\_192.168.10.126\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |
| IP address of Subnet\_#3\_  First valid/usable host IP: \_\_\_\_192.168.10.129\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Second valid/usable host IP: \_\_192.168.10.130\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  -------------------------  Second last valid/usable host IP: \_\_192.168.10.189\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Last valid/usable host IP: \_\_\_\_\_\_\_\_192.168.10.190\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |
| IP address of Subnet\_#4\_:  First valid/usable host IP: \_\_\_192.168.10.193\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Second valid/usable host IP: \_192.168.10.194\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  -------------------------  Second last valid/usable host IP: \_192.168.10.253\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Last valid/usable host IP: \_\_\_\_\_\_\_\_192.168.10.254\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |
|  |  |
| IP address of Subnet#\_\_\_\_No more subnets  First valid/usable host IP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Second valid/usable host IP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  -------------------------  Second last valid/usable host IP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Last valid/usable host IP: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |