

Q1: For the Class A IP address 32.0.0.0, which of the following subnet masks (255.255.0.0 or 255.192.0.0) would be sufficient to create at least 10 networks and each subnet supports a maximum of 100 hosts?

Mask 255.255.0.0 has 8 bits for the subnet and 16 bits for the host :  $2^8 = 256$  subnets and  $2^{16} = 65536 - 2 = 65534$  valid hosts

Mask 255.192.0.0 has 2 bits for the subnet and 22 bits for the host:  $2^2 = 4$  subnets and  $2^{22} = 4194304 - 2 = 4194302$  valid hosts

Therefore, subnet mask 255.255.0.0 will definitely be sufficient

Q2: Given to you the subnet mask 255.255.255.0 to be used to create 9 subnets with at least 150 hosts from the class B network address of 140.1.0.0, would the subnet work and why?

Yes, the subnet mask 255.255.255.0 has 8 bits for the subnets and 8 bits for the hosts

Q3: Write the IP address 145.2.2.25 mask 255.255.248.0 in slash notation?

5 bits have been used for the subnet from the subnet mask, and in total 21 bits have been used; therefore, the subnet mask could be written as: 145.2.2.25/21

Q4: Subnet the Class C IP Address 192.168.1.0 in order to have 3 subnets where each has at least 20 hosts. List the address of the first host on the subnets 1 and 2

Default mask for Class C is 255.255.255.0

The number of bits we need for 3 subnets is 3 since we could have  $2^3 = 8$  subnets and we could use the 5 bits for the hosts; thus the total number of valid hosts per subnet is  $2^5 - 2 = 32 - 2 = 30$  hosts. So, the subnet mask is 255.255.255.224

Network Number	Subnet Address	First host address
1	192.168.1.0/27	192.168.1.1
2	192.168.1.32/27	192.168.1.33

Q5: Subnet the IP Address 204.15.5.32 /24 into 8 Subnets. Is 204.15.5.65 a valid host IP address after subnetting?

We need 3 bits in order to have 8 subnets and that will leave us with 5 bits for the hosts (30 host addresses), so the new mask is 255.255.255.224 (decimal). Hence, the IP address 204.15.5.65 is a valid host address.

Subnet Name	Subnet Address	Host Address Range
A	204.15.5.0/27	1 to 30
B	204.17.5.32/27	33 to 62
C	204.17.5.64/27	65 to 94
D	204.17.5.96/27	97 to 126
E	204.17.5.128/27	129 to 158