Subnetting Example 7

Q. IP address → 10.217.182.223
Subnet mask → /11 (or 255.224.0.0)

1) Network address →
To find we need to apply the subnet mask to given IP address using bitwise AND.

IP address → ~~00000101010~~
00001010 . 11011001 . 10110110 . 11011111

Subnet mask →
11111111 . 11100000 . 00000000 . 00000000

Network address →
⇒ 00001010 . 11000000 . 00000000 . 00000000

In dotted decimal notation,
⇒ (Network Address → 10.192.0.0)

2) Broadcast Address →
It is the highest address in the subnet. To calculate it, convert all bits in host portion of network address.

Broadcast Address .
00001010 . 11011111 . 11111111 . 11111111
⇒ 10.223.255.255

5) **First usable address** →
It is the one right after the network address, i.e., increment the host portion.

Network address →
0000 1010 . 1100 0000 . 0000 0000 . 0000 0000

First usable →
0000 1010 . 1100 0000 . 0000 0000 . 0000 0001

First usable is 10·192·0·1

4) **Last usable address** →
It is the one just before broadcast address.

Broadcast Address → 10·223·255·255
Last Usable → 10·223·255·254

5) **Number of usable host addresses** →
It is the total number of addresses b/w the first usable & last usable inclusive.

→ No. of usable host addresses = last usable host − first usable host + 1

$$\Rightarrow (10.223.255.254) - (10.192.0.1) + 1$$

2) ~~Number of usable host addresses →~~
~~It the number total of first~~

5) **Number of usable host addresses →**
It is the total no. of addresses b/w
first usable address & last usable
address, inclusive :

$$\text{No. of host address} = 2^{(\text{No. of host bits})} - 2$$
$$= 2^{(21)} - 2$$
$$= 2097152 - 2$$
$$= 2,097,150 \; //$$

Therefore →
a) Network address → 10.192.0.0
b) Broadcast address → 10.223.255.255
c) First usable address → 10.192.0.1
d) Last usable address → 10.223.255.254 //
e) No. of host address → 2,097,150 //