While subnetting, we have to see which sub-network has the most number of hosts. Add Network-ID and Broadcast-ID with that and find out how many bits we need for subnetting.

Say, we have 15 hosts in a network. So we will have 17 hosts including Network-ID and Broadcast-ID. Then, we will need 5 bits represent the hosts and use 5 host bits for all sub-networks. Rest of the bits (3-bit) will be added to Network-bits.

So, in this case, we have:

number of sub-networks = 2^3=8 (possible subnets)

CIDR value for all sub-nets = 27

number of host on each sub-net = 2^5=32

number of valid hosts = 32-2=30

1st sub-net:

net-ID:	____.____.____.0000 0000
1st valid host:	____.____.____.0000 0001
last valid host:	____.____.____.0000 1110
broadcast ID:	____.____.____.0000 1111

2nd sub-net:

net-ID:	____.____.____.0001 0000
1st valid host:	____.____.____.0001 0001
last valid host:	____.____.____.0001 1110
broadcast ID:	____.____.____.0001 1111

and so on..

Router configuration:
enable router
R1> en

enter configure mode
R1# config t

interface Gigabit port
R1(config)# int g0/0

Assign IP address and subnet mask to the selected port
R1(config-if)# ip add 172.31.1.1 255.255.255.240

Apply changes
R1(config-if)# no shut

Switch configuration:
enable switch
S1> en

enter configure mode:

S1# config t

Interfacing
S1(config)# int vlan 1

Assign IP address and subnet mask
S1(config-if)# ip add 172.31.1.2 255.255.255.240

Apply changes
S1(config-if)# no shut

exit from interfacing mode
S1(config-if)# exit

define default gateway for the switch. It will be the IP address of the router of this network.
S1(config)# ip default-gateway 172.31.1.1

PC configuration:
Goto Desktop→IP Configuration
IP address: 172.31.1.14
Subnet mask: 255.255.255.240
Default gateway: 172.31.1.1 (it is the IP address of router of this network)

Network	Hosts needed	Network Address	Broadcast-ID	Subnet Mask	CIDR
Subnet-1 SW-4	58+2	0000 0000 192.168.72.0	0011 1111 192.168.72.63	1100 0000 255.255.255.192	26
Subnet-2 SW-3	29+2	0100 0000 192.168.72.64	0101 1111 192.168.72.95	1110 0000 255.255.255.224	27
Subnet-3 SW-2	15+2	0110 0000 96	0111 1111 127	1110 0000 224	27
Subnet-4 SW-1	7+2	1000 0000 128	1000 1111 143	1111 0000 240	28
Subnet-5 WAN	2+2	1001 0000 144	1001 0011 147	1111 1100 252	30