Q5)

Given IP = 192.168.1.0/24

This is a CLASS C Address, default subnet mask of CLASS C is 255.255.255.0

Since we have to classify into 4 subnets, we will have to borrow 2 bits.

So, the new subnet mask is : 255.255.255.**11**000000 = 255.255.255.192

SUBNET IP:

SUBNET 1:

192.168.1.**00**000000 to 192.168.1.**00**111111 = 192.168.1.0 to 192.168.1.63

Here, 192.168.1.0 is network IP
192.168.1.1 is default gateway
192.168.1.63 is broadcast IP

Therefore, the available IPs for hosts are 192.168.1.2 to 192.168.1.62

SUBNET 2:

192.168.1.**01**000000 to 192.168.1.**01**111111 = 192.168.1.64 to 192.168.1.127

Here, 192.168.1.64 is network IP
192.168.1.65 is default gateway
192.168.1.127 is broadcast IP

Therefore, the available IPs for hosts are 192.168.1.66 to 192.168.1.126

SUBNET 3:

192.168.1.**10**000000 to 192.168.1.**10**111111 = 192.168.1.128 to 192.168.1.191

Here, 192.168.1.128 is network IP
192.168.1.129 is default gateway
192.168.1.191 is broadcast IP

Therefore, the available IPs for hosts are 192.168.1.130 to 192.168.1.190

SUBNET 4:

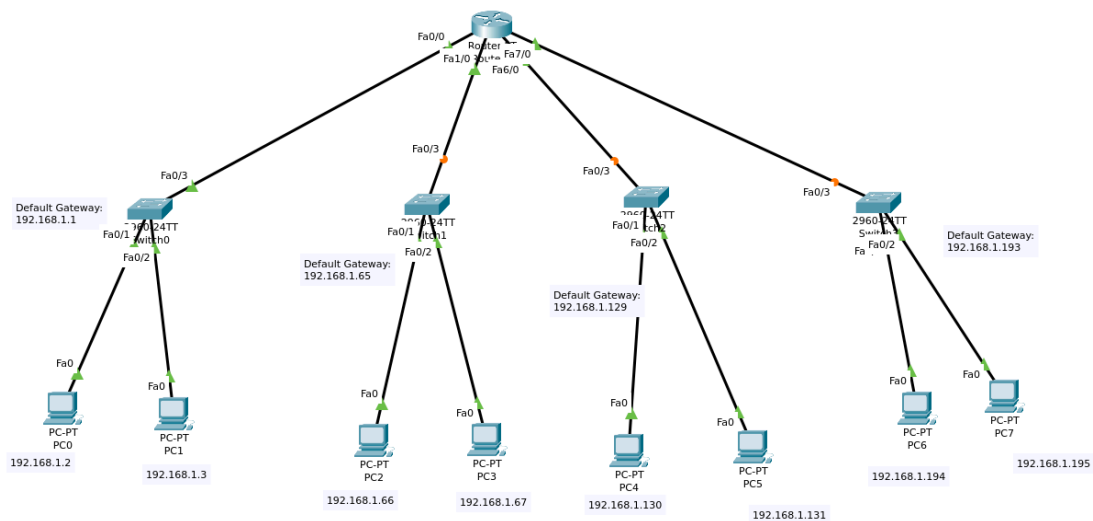192.168.1.**11**000000 to 192.168.1.**11**111111 = 192.168.1.192 to 192.168.1.255

Here, 192.168.1.192 is network IP
192.168.1.193 is default gateway
192.168.1.255 is broadcast IP

Therefore, the available IPs for hosts are 192.168.1.194 to 192.168.1.254

SIMULATION IN CISCO PACKET TRACER:

By assigning the above Subnet IP in the systems, we have:

SUBNET1:
Default gateway: 192.168.1.1
PC0:192.168.1.2
PC1: 192.168.1.3

SUBNET 2:
Default Gateway:192.168.1.65
PC2: 192.168.1.66
PC3: 192.168.1.67

SUBNET 3:
Default Gatway: 192.168.1.129
PC4: 192.168.1.130
PC5: 192.168.1.131

SUBNET 4:
Default Gateway: 192.168.1.193
PC6: 192.168.1.194
PC7: 192.168.1.195

PING CHECK:

i) Pinging from PC0 to PC1 (SUBNET 1 to SUBNET 1)

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=12ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 12ms, Average = 3ms

C:\>
```

ii) PC0 to PC2 (SUBNET 1 to SUBNET 2):

```
C:\>ping 192.168.1.66

Pinging 192.168.1.66 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.66: bytes=32 time<1ms TTL=127
Reply from 192.168.1.66: bytes=32 time<1ms TTL=127
Reply from 192.168.1.66: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.66:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

iii) PC0 to PC4 (SUBNET 1 to SUBNET 3):

```
C:\>ping 192.168.1.130

Pinging 192.168.1.130 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.130: bytes=32 time=22ms TTL=127
Reply from 192.168.1.130: bytes=32 time<1ms TTL=127
Reply from 192.168.1.130: bytes=32 time=13ms TTL=127

Ping statistics for 192.168.1.130:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 22ms, Average = 11ms

C:\>
```

iv) PC0 to PC6

```
C:\>ping 192.168.1.194

Pinging 192.168.1.194 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.194: bytes=32 time=4ms TTL=127
Reply from 192.168.1.194: bytes=32 time<1ms TTL=127
Reply from 192.168.1.194: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.1.194:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms

C:\>
```