

NORTH SOUTH UNIVERSITY

*Center of Excellence in Higher Education*

Assignment

**North South University**

**Department of Electrical and Computer Engineering**

**CSE 438: Data communication and Network**

**Faculty: SAM3**

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**Answer 1:**

Since there is no machine that is configured as an IP router, and there is no IP router on this network, we need to find out which hosts are able to communicate directly in the following network.

**So, let's analyze which hosts can communicate with each other directly without IP router by finding their subnet range:**

* Host A has IP address 192.0.3.88 with a subnet mask of 255.255.255.0, placing it in the subnet range 192.0.3.0 to 192.0.3.255. It can send data to all hosts in 192.0.3.(0-255)
* Host B has IP address 192.0.3.94 with a subnet mask of 255.255.255.240, placing it in the subnet range 192.0.3.80 to 192.0.3.95. It can send data to all hosts in 192.0.3.(80-95)
* Host C has IP address 192.0.3.200 with a subnet mask of 255.255.255.240, placing it in the subnet range 192.0.3.192 to 192.0.3.207. It can send data to all hosts in 192.0.3.(192-207)

1. Host A can transmit data to Host B
2. Host B can transmit data to Host A
3. Host A can transmit data to Host C
4. Host C cannot transmit data to Host A
5. Host B cannot transfer data to Host C
6. Host C cannot transfer data to Host B

Calculation:

Host C:

IP address: 192.0.3.200/28

Subnet mask: 255.255.255.240

Binary IP address: 11000000.00000000.00000001.11001000

Binary subnet mask: 11111111.11111111.11111111.11110000

Subnet address: 11000000.00000000.00000001.11000000 [perform bitwise AND]

Subnet address: 192.0.3.[192-207] (2^4=16,192+16-1=207)

Host B:

IP address: 192.0.3.94/28

Subnet mask: 255.255.255.240

Binary IP address: 11000000.00000000.00000001.01011110

Binary subnet mask: 11111111.11111111.11111111.11110000

Subnet address: 11000000.00000000.00000001.01010000 [perform bitwise AND]

Subnet address: 192.0.3.[80-95] (2^4=16,80+16-1=95)

**Answer 4:**

**a) Define an extended-network-prefix that allows the creation of 20 hosts on each subnet.**

To be able to address 20 hosts, we need a minimum of 5 bits, 2^4=16. This gives us a subnet mask of 255.255.255.224, or /27 in CIDR notation.

**b) What is the maximum number of hosts that can be assigned to each subnet?**

The maximum number of hosts that can be assigned to each subnet is 2^5 - 2 = 30. This is because we need to reserve two IP addresses for the network address and broadcast address.

**c) What is the maximum number of subnets that can be defined?**

5 bits for host, 3 bits for network portion, therefore 2^3=8 subnets possible to be defined.

