# *420-A32 - Networks*

# *IP Addressing and Subnetting*

**Date Due: April 27th, 2016**

**Learning Objectives**

Upon successful completion of this exercise, the student will be able to:

* Apply subnet mask calculations.

**To submit**

You must submit this assignment through Moodle.

To do:

**IP Addressing**

**Complete the following subnet questions.**

**Question 1 (50%)**

This question refers to the network you designed in Assignment #1. Assume that the school now decides that they want to subnet their network so that each room has its own subnet and IP address range.

**Assumptions:**

1. The computer and printer in the shared room can be added to the teacher’s lounge subnet.
2. All other rooms must be on their own subnet.
3. You are given a single IP address for the whole school. It is 192.168.100.100
4. Each computer or printer will need an IP address.
5. Assume that the first available IP address in each subnet will be used for the Default Gateway. All others are free to be used for equipment.

**Answer the following questions:**

1. How many subnets do we need?
2. How many hosts will each subnet be able to support taking into account the Default Gateway which uses one of the available IP addresses?
3. What will be your subnet mask in decimal?
4. What will be the network address of each subnet?
5. What will be the broadcast address of each subnet?
6. What will be the IP address range of each subnet?
7. You **do not** have to draw a diagram. Instead make a table for each room that shows the Network Address, the Default Gateway address and the Broadcast address for that room plus gives a static IP address to each of the devices in the room within their allowable subnet range. You do not have to give addresses to the routers or switches.

**Question 2 (30%)**

Assume an Internet Service Provider (ISP) has the following address block available to them to assign to their customers: 128.211.0.0/16

* 1. Suppose the ISP has three customers, one customer needs 12 IP addresses, the second 10 addresses and the third customer needs 9. Subnet this IP address so that the number of hosts for each subnet is the smallest it can be but still allow each customer to have the required number of hosts.
  2. How many subnets will be available and how many hosts are available within each subnet.
  3. Assign the three lowest subnet network addresses to these three customers. For each customer show their subnet network address, broadcast address and the range of available IP addresses on their subnet.

**Question 3 (20%)**

Network Address: 192.168.100.0

Subnet mask: 255.255.255.240

1. What is the slash notation for this network address?
2. How many subnets can be supported if the all zeroes and all ones subnets are not used?
3. How many host addresses can there be per subnet?
4. How many usable host addresses are there per subnet?
5. What is the network address for each subnet?
6. What is the broadcast address for each subnet?
7. What is the address range for the hosts in each subnet?

**Note:**

10 marks on this assignment are reserved for presentation. This includes a valid cover page, neatness and completeness of the answers.