BAIT1013 Introduction To Computer Networks

Tutorial 8.1: Subnetting IP Networks (Class A, B, C)

Q1. The network of Dimension International School is subnetted based on an IPv4 address of 192.168.3.0/24. The School consists of 20 classroom and 5 offices. Each classroom and office require a subnet to support the teaching and administrative works. Answer the following questions.

(i) How many subnets are needed? *(201705 TAR UC, resit)* (1 mark)

(ii) How many bits must be borrowed to support the required number of subnets? *(201705 TAR UC, resit)* (2 marks)

(iii) How many usable host addresses per subnet? *(201705 TAR UC, resit)* (2 marks)

(iv) Compute the decimal value of the new subnet mask. *(201705 TAR UC, resit)* (2 marks)

(v) Compute and list the first 4 subnets information in the table below. Write your answer in dotted decimal format. *(201705 TAR UC, resit)* (8 marks)

Subnet Number	Subnet Address/Prefix Length	First Usable Address	Last Usable Address	Broadcast Address

Table 1: Subnet Table

Tutorial 8.1: Subnetting IP Networks (Class A, B, C)

Q2. Given Host IP address 192.168.4.210 and subnet mask 255.255.255.240. Complete the Table 2. *(201703 TAR UC, resit)* (8 marks)

Host IP Address	
Subnet Mask	
Number of Subnet Bits	
Number of Subnets	
Number of Host Bits per Subnet	
Number of Usable Hosts per Subnet	
Subnet Address for this IP Address	
IP Address of First Usable Host on this Subnet	
IP Address of Last Usable Host on this Subnet	
Broadcast Address for this Subnet	

Table 2: Custom Subnet Table

Q3. With reference to Figure 1, answer the following questions:

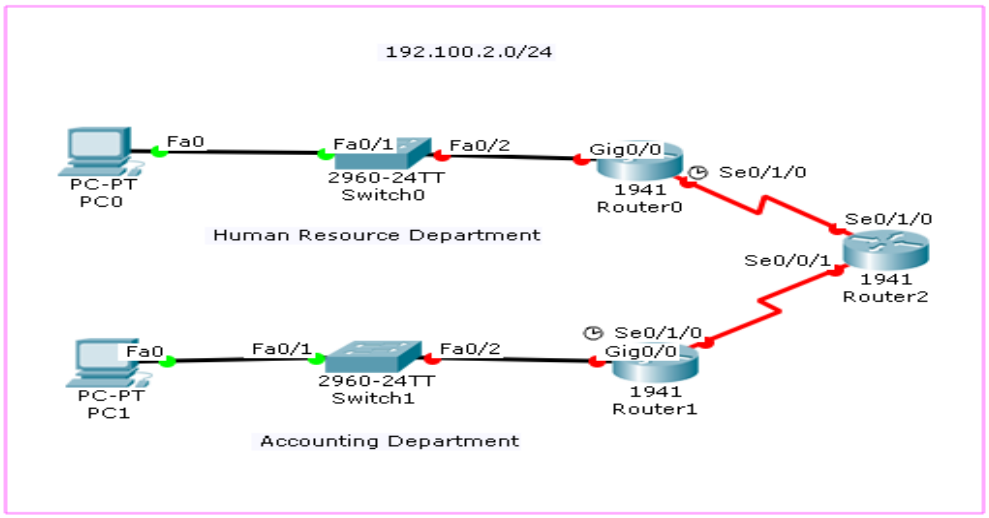

Figure 1: Branch Campus Network

(i) In Figure 1, how many subnets are needed? *(201609 TAR UC, Main)* (1 mark)

(ii) How many bits must be borrowed to support the required number of subnets? *(201609 TAR UC, Main)* (2 marks)

(iii) How many usable host addresses per subnet? *(201609 TAR UC, Main)* (2 marks)

(iv) Compute the decimal value of the new subnet mask. *(201609 TAR UC, Main)* (2 marks)

(v) Computer and list all possible subnet information in the format given in Table 3. *(201609 TAR UC, Main)* (8 marks)

Subnet No	Subnet Address/ Prefix length	Host Range	Broadcast Address

Table 3: Subnetting Table

Q4. Provide any TWO (2) reasons for subnetting a network. (*201709 TAR UC main*) (4 marks)

Tutorial 8.1: Subnetting IP Networks (Class A, B, C)

Q5. OCM College has an IPv4 network based on 172.38.0.0/16 address. They are required to provide subnets with 4,096 hosts per subnet. Based on these needs, answer the following questions.

(i) How many subnets are needed? (1 mark)

(ii) How many bits need to be borrowed to support the required subnets? (2 marks)

(iii) How many *usable* host addresses per subnet? (2 marks)

(iv) What is the decimal value of the new subnet mask? (2 marks)

(v) Calculate and list the subnets information in the table below. Write your answer in dotted decimal format.

Subnet No.	Network Address	First Usable Address	Last Usable Address	Broadcast Address

Table 4: Subnet Table (8 marks)