

CNG 436 WIRELESS COMMUNICATIONS AND NETWORK

ASSIGNMENT 1 REPORT

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We read and accept the submission rules individually and the extra limitations specified in each question. This is our own work with no involvement of anyone else.

TASKS

1) $STD_NO = 2385383$

$$STD_NO \% 10 = 3$$

$$STD_NO \% 20 = 3$$

$$STD_NO \% 30 = 23$$

⇒ So the range of IP addresses:

$$(192+23).3.3.0 = 215.3.3.0$$

$$(192+23).3.(3+30).0 = 215.3.33.0$$

➔ **215.3.3.0 to 215.3.33.0**

2) $STD_NO \% 2 = 1$

$$STD_NO \% 25 = 8$$

$$STD_NO \% 100 = 83$$

⇒ So the no of hosts per workgroup is:

- Administration: $9+1 = 10$
- Classrooms: $130+83 = 213$
- Labs: $16+3 = 19$
- Student Accommodation: $130+83 = 213$
- Staff: $35+8 = 43$

VLSM & Supernetting:

⇒ As we can represent 254 different host per class C address, we will need different amount of class C per workgroup based on the hosts on that particular workgroup. So the class C we need to represent each workgroup is as shown below:

- Administration = **1/16** (enough to represent 10 hosts)
- Classrooms = **1** (enough for 213 hosts)
- Labs = **1/8** (enough for 19 hosts)
- Student Accommodation = **1** (enough for 213 hosts)
- Staff = **1/4** (enough for 43 hosts)

⇒ In total $(1/16+1+1/8+1+1/4)$, we will need **3 class C** addresses but as it cannot be represented as a power of 2, we will reserve **4** (2^2).

⇒ From $2^h-2 \geq 2$, **$h=2$ bits are borrowed.**

Block reserved	{	➔ 215.3 .000000 11.0	- cannot take this one to advertise as the reserved bits aren't all 0s.
		.000001 00.0	- can be the first one, advertise this address: 215.3.4.0/22
		.000001 01.0	- 215.3.5.0
		.000001 10.0	- 215.3.6.0
		.000001 11.0	- 215.3.7.0

⇒ Reserved from **215.3.4.0 to 15.3.7.0**

⇒ The mask according to the advertised address is: **255.255.252.0**

Subnetting:

Classrooms: 215.3.4. 00000000 / 24 -> **NA – 215.3.4.0**
(213 hosts – 8 bits) .00000001 -> **FA – 215.3.4.1**
.11111110 -> **LA – 215.3.4.254**
.11111111 -> **BA – 215.3.4.255**

Student Accommodation: 215.3.5. 00000000 / 24 -> **NA – 215.3.5.0**
(213 hosts – 8 bits) .00000001 -> **FA – 215.3.5.1**
.11111110 -> **LA – 215.3.5.254**
.11111111 -> **BA – 215.3.5.255**

Administration: 215.3.6.0000|0000 / 28 -> Network Address (**NA**) – **215.3.6.0**
(10 hosts – 4 bits) .0000|0001 -> First Available Address (**FA**) – **215.3.6.1**
.0000|1110 -> Last Available Address (**LA**) – **215.3.6.14**
.0000|1111 -> Broadcast Address (**BA**) – **215.3.6.15**

Labs-1: 215.3.6. 001|00000 / 27 -> **NA – 215.3.6.32**
(19 hosts – 5 bits) .001|00001 -> **FA – 215.3.6.33**
.001|11110 -> **LA – 215.3.6.62**
.001|11111 -> **BA – 215.3.6.63**

Labs-2: 215.3.6. 010|00000 / 27 -> **NA – 215.3.6.64**
(19 hosts – 5 bits) .010|00001 -> **FA – 215.3.6.65**
.010|11110 -> **LA – 215.3.6.94**
.010|11111 -> **BA – 215.3.6.95**

Staff: 215.3.6. 10|000000 / 26 -> **NA – 215.3.6.128**
(43 hosts – 6 bits) .10|000001 -> **FA – 215.3.6.129**
.10|111110 -> **LA – 215.3.6.190**
.10|111111 -> **BA – 215.3.6.191**