ITEC350 – HW #2

Given: IP 193.2.3.0/24

Atlanta HQ : 58 hosts
Perth HQ : 26 hosts
Sydney HQ : 10 hosts
Corpus HQ : 10 hosts
WAN1 : 2 IP addr
WAN2 : 2 IP addr
WAN3 : 2 IP addr

I. Atlanta HQ : 58 hosts ← the subnet with the greatest # of hosts.

① # of bits for a host id ?

if 6 bits
$\Rightarrow 2^6 - 2 = 64 - 2 = 62$

good ! to cover 58 host ids

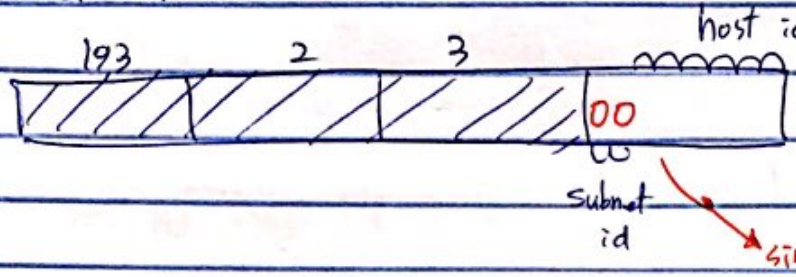
∴ 6 bits for a host id

② # of bits for a subnet id ?

8 − 6 bits = 2 bits for a subnet id.

No. 2

③ subnet id ?



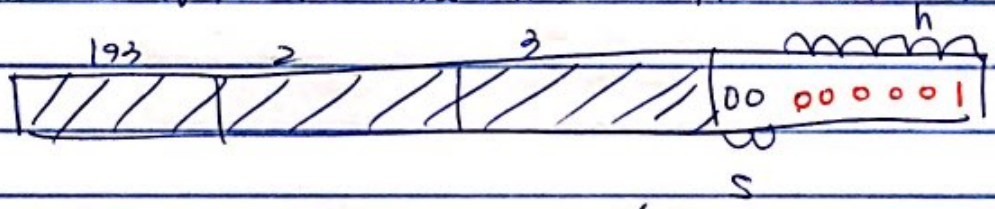
since this is the first subnet.

&

VLSM allows all ϕ_s are a subnet id.

note: original IP Addressing doesn't allow all ϕ_s as a subnet id

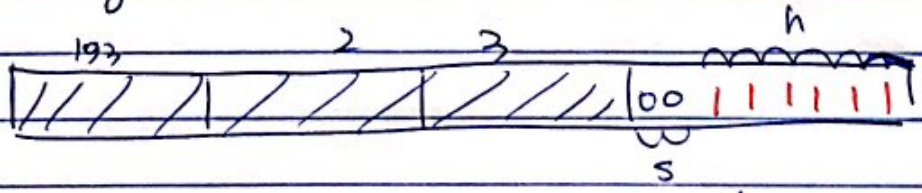
Question 1 ⇒ ④ IP Addr of the 1st usable host id in Atlanta HQ ?



⇒ 193 . 2 . 3 . 1 /26

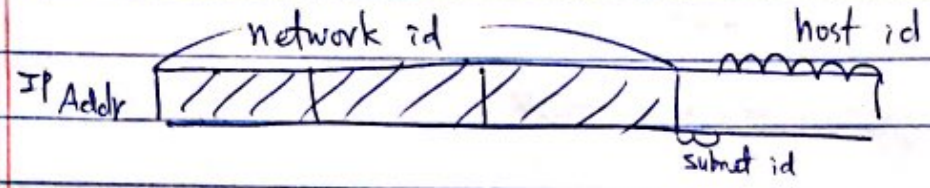
24 (# of bits for a network id)
+
2 (# of bits for a subnet id
=
~~26~~

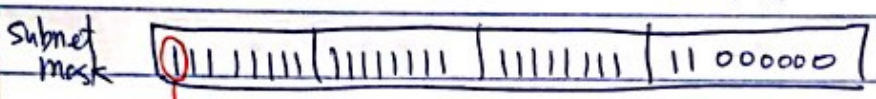
Question 2 ⇒ ⑤ Broadcasting IP Addr for Atlanta HQ ?



⇒ 193 . 2 . 3 . 63 /26

Question 3 ⇒ (b) Subnet mask for AtlantaHQ?





1 if the matching IP Addr bits is a part of (a net id or a subnet id.)

0 if " " is a part of a host id

⇒ 255 . 255 . 255 . 192

II. Perth HQ : 26 hosts

① # of bits for a host id ?

if 5 bits

$2^5 - 2 = 32 - 2 = 30$

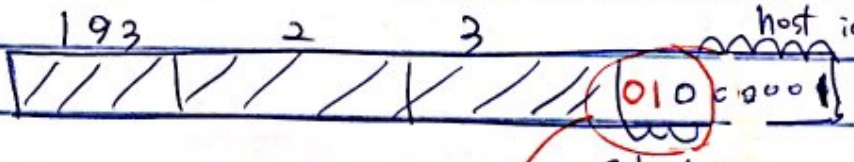
good to cover 26 host id.

∴ (5 bits) for a host id

② # of bits for a subnet id ?

$8 - 5 =$ (3 bits) for a subnet id.

Question 4 ⇒ ③ IP Addr for the 1st usable host id in Perth HQ ?



0 1 0

since the previous subnet id is 00.

00 in binary + 1 = 01.

Thus, the first two bits must be 01

and the remaining bit(s) must be filled up with 0(s).

⇒ 193. 2. 3. 65 / 27

III SydneyHQ : 10 hosts

① # of bits for a host id

if 4 bits

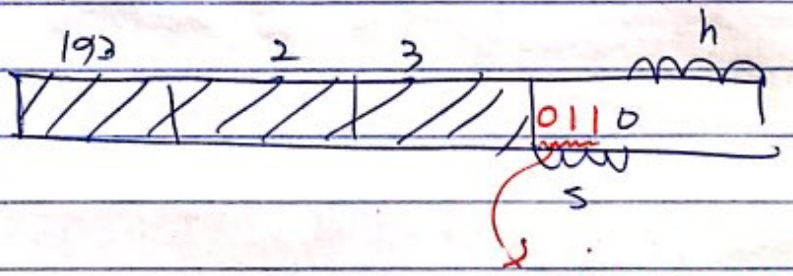
$\Rightarrow 2^4 - 2 = 14$

$\therefore$ 4 bits

② # of bits for a subnet id

$8 - 4 = 4$ bits

③ subnet id



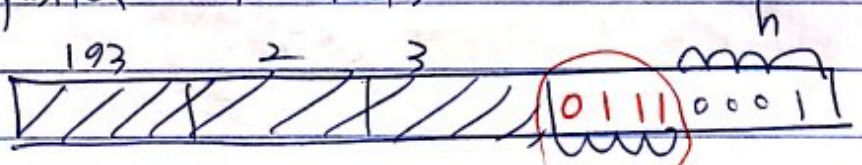
perthHQ 010

\+ 1

= 011

IV CorpusHQ : 10 hosts

Question 5 ⇒



sydneyHQ 0110

\+ 1

= 0111

⇒ 193. 2. 3. 113/28