Date: _____

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Section. A

## Problem 1

1) IP address 172.168.1.0

req host = 160 req subnet = 60.

IP is in class B. (since first octet blw 128-191)

default subnet mask = 255.255.0.0

Now

for 160 host per subnet nearest power of 2 256($2^8$)

for 60 subnet 64 ($2^6$).

upper bound = $2^8 \times 2^6$ = 16,384

avaiable IP: $2^{16}$ = 65,536

sin 16,384 < 65,536 so subnetting is possible.

default subnet mask = 11111111.11111111.00000000.00000000

borrow 6 bits from the host portion.

11111111.11111111.111111oo.oooooooo

Increment in 3rd octet bc 6 bits borrowed = 4.

first subnet = 172.168.0.0 – 172.168.3.255

second = 172.168.4.0 – 172.168.7.255.

third = 172.168.8.0 – 172.168.11.255.

172.168.10 falls within first subnet

172.168.00 – 172.168.3.255.

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Problem 2 10.10.20.0

host = 100 subnet = 100

IP 10.10.20.0 in in class A

default subnet mask = 255.0.0.0

100 host requires 128 hosts ($2^7$)

100 subnet round upto 128 subnet ($2^7$)

total available IP in class A = $2^{24} = 16,777,216$

$2^7 \times 2^7 = 16,384$

so subnetting is feasible.

default subnet mask = 11111111.00000000.00000000.00000000

borrow 7 bits

11111111.1111111.0.11000000.00000000

new subnet mask = 255.254.0.0

Increment in second octet = 2.

first subnet = 10.0.0.0 - 10.1.255.255.

second = 10.2 - 10.3.

third. 10.4 - 10.5.

fourth 10.6 - 10.7

fifth 10.8 - 10.9

sixth 10.10 - 10.11

so IP falls into sixth subnet

10.10.0.0 - 10.11.255.255.

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## Problem 3 192.168.29.1

host = 100 subnet = 60.

IP is in class C.

default subnet mask = 255.255.255.0.

100 host → 128 host ($2^7$)

60 subnet → 64 subnets ($2^6$)

total available IP = $2^8$ = 256

Upper bound. $2^7 \times 2^6$ = 8192 which is feasible.

default subnet mask = 11111111.11111111.11111111.00000000

6 bit borrow.

11111111.11111111.11111111.111111.00

new subnet mask: 255.255.255.252

increment in 4th octet = 4.

first: 192.168.29.0 - 192.168.29.3.

second: 192.168.29.4 - 192.168.29.7.

so IP falls in first subnet.

## Problem 4 220.107.49.1

host - 30 Subnet - 60.

It is in class C.

default subnet class: 255.255.255.0.

30 host → 32 host ($2^5$)

60 subnet → 64 subnet ($2^6$).

available IP = $2^8$ = 256.

Upper bound - $25 \times 2^6$

2048. which is feasible.

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default subnet mask. 11111111.11111111.11111111.00000000

6 bit borrow.

11111111.11111111.11111111.111 00000

new subnet mask = 255.255.255.224

increment in 4th octet = 32.

first - 220.162.49.0 - 220.162.49.31

second 220.162.49.32 - 320.162.49.63.

so IP falls blw first subnet.