Homework 4

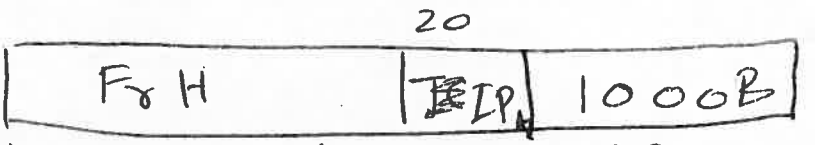
CSCI 4273/5273

Fall 2014

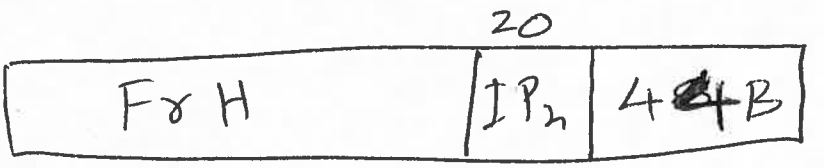
Solution to selected problems

① A —— (R) —— B

A – R:

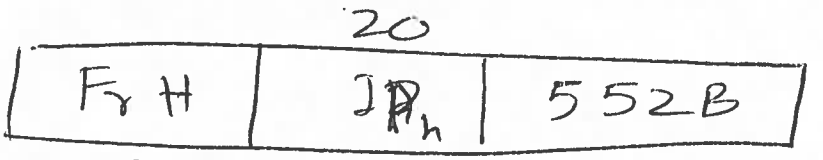


L = 1000, Ident = x, Offset = ∅, F = 1

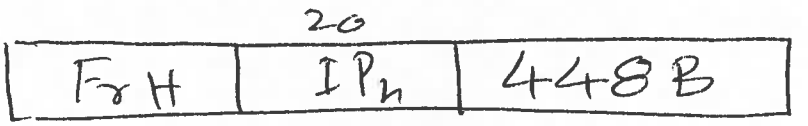


L = 44, Ident = x, Offset = 125, F = ∅

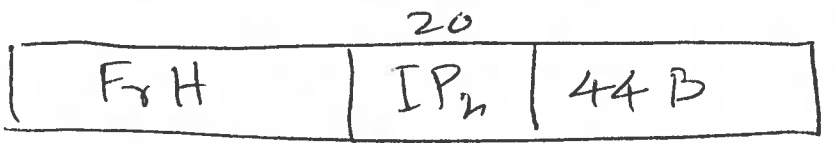
R – B



L = 552, Ident = x, offset = 0, F = 1



L = 448, Ident = x, Offset = 69, F = 1



L = 44, Ident = x, offset = 125, F = ∅

(2) Ident field is 16 bits long

$\Rightarrow 2^{16}$ packets can be sent in 60 sec

$$\Rightarrow BW = \frac{2^{16} \times 576 \times 2^3}{60}$$

$$= 5.033 \text{ Mbps}$$

(3) (a)

	A	B	C	D	E	F
A	0	∞	3	8	∞	∞
B	∞	0	∞	∞	2	∞
C	3	∞	0	∞	1	6
D	8	∞	∞	0	2	∞
E	∞	2	1	2	0	∞
F	∞	∞	6	∞	∞	0

(b)

	A	B	C	D	E	F
A	0	∞	3	8	4	9
B	∞	0	3	4	2	∞
C	3	3	0	3	1	6
D	8	4	3	0	2	∞
E	4	2	1	2	0	7
F	9	∞	6	∞	7	0

(c)

	A	B	C	D	E	F
A	0	6	3	6	4	9
B	6	0	3	4	2	9
C	3	3	0	3	1	6
D	6	4	3	0	2	9
E	4	2	1	2	0	7
F	9	9	6	9	7	0

4 (a) Interface 0
(b) R2
(c) R4
(d) R3
(e) R4

6 (a) Networks C, D (upto 31 hosts)

C: Addresses: 212.1.1.0 — 212.1.1.31
Subnet mask = 255.255.255.224
Subnet #: 212.1.1.0

D. Addresses: 212.1.1.32 — 212.1.1.63
Subnet mask: 255.255.255.224
Subnet #: 212.1.1.32

B: Addresses: 212.1.1.64 — 212.1.1.127
Subnet mask: 255.255.255.192
Subnet #: 212.1.1.64

A: Addresses: 212.1.1.128 — 212.1.1.255
Subnet mask: 255.255.255.128
Subnet #: 212.1.1.128

6 b) If D grows to 32 hosts, we will need to assign 64 IP addresses to it. This is because one IP address in all ~~subet~~ subnets is reserved for broadcast.

This will mean we will need to have 32 + 64 + 64 + 128 IP addresses. This exceeds 256 IP addresses that a class C ~~addr~~ network address can support.

7 a) B

b) A

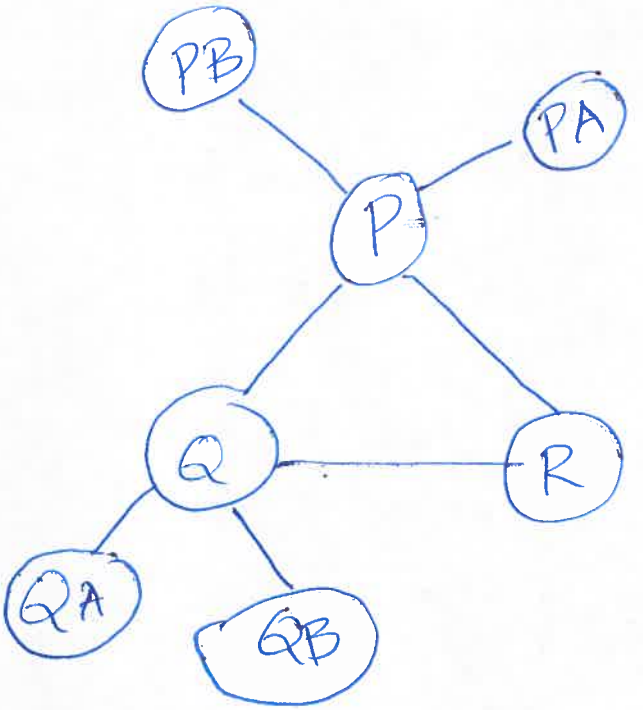
c) E

d) F

e) C

f) D

9 a



Routing table for P

Prefix/length	next Hop
C1.A3.0.0/16	PA
C1.B0.0.0/12	PB
C2.0.0.0/8	Q
C3.0.0.0/8	R

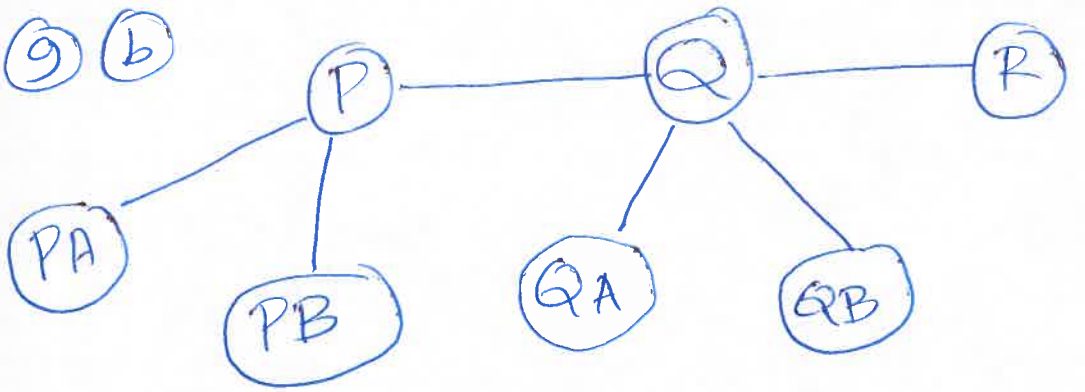
Routing table for Q

C1.0.0.0/8	P
C3.0.0.0/8	R
C2.0A.10.0/20	QA
C2.0B.0.0/16	QB

Routing table for R

C1.0.0.0/8	P
C2.0.0.0/8	Q

(9) (b)



Routing table for P

C1. A3.0.0/16	PA
C1. B0.0.0/12	PB
C2.0.0.0/7	Q

Routing table for R

C0.0.0.0/6	Q

(10) (a) If Q advertises path to A (Q-A), some traffic to A may flow on link Q-A

If Q doesnot advertise path to A, traffic to A from Q will ~~foo~~ flow on Q-A, but all other traffic to A will flow on PA

(b) Q must advertise QA path

(c) A routers will have to be updated with route A-Q. Otherwise, all traffic from A will go via P.

(11) (a) correct

(b) not correct

(c) not correct

(d) Correct

(e) Correct

(12) (a) seq # : 32 bits

Time to wrap around = $\frac{2^{32} \times 2^3}{10^9}$ = 34.36 sec

(b) Timestamp increments 1000 times in the wrap around period of seq #

Time for timestamp to wrap around

$= \frac{2^{32}}{1000} \times 34.36$

$= 1.47 \times 10^8$ sec.