Date

Assignment 4 :-

Chap 4 :-

P9 :-

Prefix Match	Interface
00	0
010	1
011	2
10	2
11	3

1.) Interface 0 :-

Associated Range : 00xxxxxx
Num of Addresses : 2^6 : 64 Addresses

2.) Interface 1 :-

Associated Range : 010xxxxx
Num of Addresses : 2^5 : 32 Addresses

3.) Interface 2 :-

Associated Range : 011xxxxx
10xxxxxx
Num of Addresses : $2^5 + 2^6 = 32 + 64 = 96$ Addresses

4.) Interface 3 :-

Associated Range : 11xxxxxx
Num of Addresses : 2^6 : 64 Addresses

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P11 :-

Subnet 1 : 60 interfaces : 2^6 223.1.17/24

Subnet 2 : 90 interfaces : 2^7

Subnet 3 : 12 interfaces : 2^4

223.1.17.00000000/24

223.1.17.0/25 223.1.17.10000000/25

223.1.17.128/26 223.1.17.11000000/26

223.1.17.192/27 223.1.17.11100000/27

223.1.17.224/28 223.1.17.11110000/28

223.1.17.240/28

Subnet 2 : 223.1.17.0/25

Subnet 1 : 223.1.17.128/26

Subnet 3 : 223.1.17.192/27 but if we want the subnet with the least wastage then : 223.1.17.224/28

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P21 :-

Match	Action
ingress port = 1 ; IP Src = 10.3.*, IP Dest = 10.1.*	forward (2)
ingress port = 2 ; IP Src = 10.1.* , IP Dest = 10.3.*	forward (1)
ingress port = 1/2 , IP Src = 10.*, IP Dest = 10.2.03	forward (3)
ingress port = 1/2 , IP Src = 10.*, IP Dest = 10.2.04	forward (4)
ingress port = 4, IP Src = 10.2.0.4, IP Dest = 10.2.0.3	forward (3)
ingress port = 3, IP Src = 10.2.0.3, IP Dest = 10.2.0.4	forward (4)

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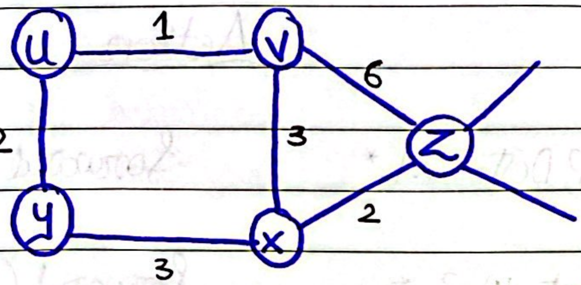
Chapter 5 :-

P5 :-



At t = 0

DV in u :-	DV in v :-	DV in y :-	DV in x :	DV in z :
$D_u(u) = 0$	$D_v(v) = 0$	$D_y(y) = 0$	$D_x(x) = 0$	$D_z(z) = 0$
$D_u(v) = 1$	$D_v(u) = 1$	$D_y(u) = 2$	$D_x(u) = \infty$	$D_z(u) = \infty$
$D_u(y) = 2$	$D_v(x) = 3$	$D_y(v) = \infty$	$D_x(v) = 3$	$D_z(v) = 6$
$D_u(x) = \infty$	$D_v(z) = 6$	$D_y(x) = 3$	$D_x(y) = 3$	$D_z(x) = 2$
$D_u(z) = \infty$	$D_v(y) = \infty$	$D_y(z) = \infty$	$D_x(z) = 2$	$D_z(y) = \infty$

At t = **2**

DV in u :-	DV in v :-	DV in y :-	DV in x :-	DV in z :-
$D_u(u) = 0$	$D_v(v) = 0$	$D_y(y) = 0$	$D_x(x) = 0$	$D_z(z) = 0$
$D_u(v) = 1$	$D_v(u) = 1$	$D_y(u) = 2$	$D_x(u) = 4$	$D_z(u) = 6$
$D_u(x) = 4$	$D_v(x) = 3$	$D_y(v) = 3$	$D_x(v) = 3$	$D_z(v) = 5$
$D_u(y) = 2$	$D_v(y) = 3$	$D_y(x) = 3$	$D_x(y) = 3$	$D_z(x) = 2$
$D_u(z) = 6$	$D_v(z) = 5$	$D_y(z) = 5$	$D_x(z) = 2$	$D_z(y) = 5$

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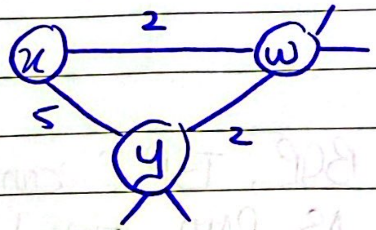
P7 :-



w to u : 5

y to u : 6

DV in x

$D_x(x) : 0$

$D_x(y) : 4$

$D_x(w) : 2$

$D_x(u) : 7$

b.) Link Cost Change for $c(x,w) : 1$

DV in x :-	DV in y :-	Dw in w :-
$D_x(x) : 0$	$D_y(y) : 0$	$D_w(w) : 0$
$D_x(y) : 3$	$D_y(x) : 3$	$D_w(x) : 1$
$D_x(w) : 1$	$D_y(w) : 2$	$D_w(y) : 2$
$D_x(u) : 6$	$D_y(u) : 6$	$D_w(u) : 5$

c.) Link Cost Change for $c(x,w) : 4$

DV in x :-

$D_x(x) : 0$ $D_x(w) : 2$

$D_x(y) : 4$ $D_x(u) : 7$

P14 :-

a.) Since, it's a gateway router, it's running both eBGP and iBGP but it learn about x from eBGP

b.) 3a learns about x using OSPF and iBGP

c.) 1c learns about x using eBGP

d.) 1d learns about x using iBGP and RIP

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P16 :-

To influence the traffic path in BGP, ISP C can use the AS Path attribute along with the AS_PATH prepend technique.

West Coast Path:
D, C, B, B, A

East Coast Path
D, C, B, A

By adding additional instances of its own AS number in the AS Path, ISP B will see the path ~~Bs~~ through the West Coast as longer, & therefore it will prefer the East Coast peering point.

Chapter 6 :-

P2 :-

1	0	1	0
1	1	1	1
0	1	1	0
0	0	1	0

=>

1	1	1	1
1	1	1	1
0	1	1	0
0	1	1	0

-> double-bit error:

0	1	1
1	0	1
1	1	0

=>

1	1	0
1	1	0
0	0	0

P3

```
              10111110
10011 ) 10101010100000
        10011
        ------
          11001
          10011
          ------
           10100
           10011
           ------
             11110
             10011
             ------
              11010
              10011
              ------
               10010
               10011
               ------
                1100 - R
```

D = 10101010101100

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P6 :-

```
              100001001
10011 | 1000100101010000
        10011
          10001
          10011
             10010
             10011
                01000
                10011
                11011

              111101111
10011 ) 01110100011 10000
         10011
         111100
         10011
          110100
          10011
           100100
           10011
            01011
            10011
            110000
            10011
             101100
             10011
               10100
               10011
                1110
```

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P11 :-

a.) Node A succeeds in slot 4 : $p(1-p)^3$ =

b.) Some Node succeeds in slot 5 : $1-(1-p)^4$ =

c.) First success in slot 4 = $(1-p)^3 p$ =

d.) Efficiency = $E = Np(1-p)^{N-1}$

P17 :-

100 Mbps Chennel :

1.) Backoff time = 100 x Slot time
= 100 x 5.12 = 512 μs

2.) Slot time = $\frac{512 \text{ bits}}{100 \text{ Mbps}}$ = 5.12 μs

1 Gbps Chennel :

1.) Backoff time = 100 x Slot time
= 100 x 0.512 = 51.2 μs

2.) Slot time = $\frac{512 \text{ bits}}{1 \text{ Gbps}}$ = 0.512 μs

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P19:-

slot time for 10Mbps Channel: $\frac{2 \times \text{Prop delay}}{\text{data rate}} = \frac{2 \times 245}{10 \times 10^6} = 49\mu s$

Backoff time for B = 1 x Slot time = 49μs

Since $K_A = 0$, A will not wait for any additional time and can start retransmitting immediately after the backoff time

→ B begins retransmission at $t = 245 + \underset{\text{for B}}{\text{Backoff time}} = 245 + \cancel{0}49 = 294$ bit times

→ A begins retransmission immediately after the collision is detected at t = 245 bit times

After returning to Step 2, both A and B must wait for an idle channel before initiating transmission. The time at which A's signal reaches B is t = 245 + 2 x 245 = 735 bit times

At t = 294 bit times, B refrains from transmitting because the channel is not idle due to A's ongoing transmission.