Assignment 10

Name: Rajat Rajesh Shetty
CWID: 10477484

5. a)

Prefix Match	Link Interface
1110000000	0
1110000001000000	1
1110000	2
111000011	3
Other-wise	3

b) Prefix match for first address is 5th entry: link interface 3
Prefix match for second address is 3rd entry: link interface 2
Prefix match for third address is 4th entry: link interface 3

6.

Destination Address Range Link Interface
00000000 – 00111111 0
01000000 – 01011111 1
01100000 – 01111111 2
10000000 – 10111111 2
11000000 – 11111111 3

Number of addresses for interface 0 = 2^6 =64
Number of addresses for interface 1 = 2^5 =32
Number of addresses for interface 2 = 2^5 +2^6 =32+64 =96
Number of addresses for interface 3 = 2^6 =64

Available host address = Number of address – 2

One IP address is reserved for network and other for the broadcast.

Final solution is as follows:

Prefix Match	Interface	Destination Address Range	Available IP Address	Hosts
00	0	00000000 – 00111111	64	62
010	1	01000000 – 01011111	32	30
011	2	01100000 – 01111111	32	30
10	2	10000000 – 10111111	64	62
11	3	11000000 – 11111111	64	62

7.

Destination Address Range	Link Interface
11000000 through (32 addresses) 11011111	0
10000000 through (64 addresses) 10111111	1
11100000 through (32 addresses) 11111111	2
00000000 through (128 addresses) 01111111	3

8.

223.1.17.0/26

223.1.17.128/25

223.1.17.192/28

11.

Any IP address in range 128.119.40.128 to 128.119.40.191

Four equal size subnets:128.119.40.64/28, 128.119.40.80/28, 128.119.40.96/28, 128.119.40.112

14.

The maximum size of data field in each fragment= 680(because there are 20 Bytes IP header).Thus the number of required fragments= [2400-20/680] = 4. Each fragment will have Identification number 422. Each fragment except the last one will be of size 700 bytes (including IP header).The last datagram will be of size 360 bytes (including IP header).The off sets of the 4 fragments will be 0,85,170,255. Each of the first 3fragments will have flag=1; the last fragment will have flag=0.

15.

MP3 file size = 5 million bytes. Assume the data is carried in TCP segments, with each TCP segment also having 20 bytes of header. Then each datagram can carry 1500-40=1460 bytes of the MP3 file

Number of datagrams required $= \left\lceil \frac{5 \times 10^6}{1460} \right\rceil = 3425$. All but the last datagram will be 1,500 bytes; the last datagram will be 960+40 = 1000 bytes. Note that here there is no fragmentation – the source host does not create datagrams larger than 1500 bytes, and these datagrams are smaller than the MTUs of the links.

16.

a) Home addresses: 192.168.1.1, 192.168.1.2, 192.168.1.3 with the router interfacebeing192.168.1.4

b)

NAT Translation Table	WAN Side LAN Side
24.34.112.235,4000	192.168.1.1,3345
24.34.112.235,4001	192.168.1.1,3346
24.34.112.235,4002	192.168.1.2,3445
24.34.112.235,4003	192.168.1.2,3446
24.34.112.235,4004	192.168.1.3,3545
24.34.112.235,4005	192.168.1.3,3546

20.

S2 Flow Table

Match	Action
Ingress Port=3; IP Dst=10.1.*.*	Forward(2)
Ingress Port=3; IP Dst=10.3.*.*	Forward(2)

Ingress Port=4; IP Dst=10.1.*.* Forward(1)

Ingress Port=4; IP Dst=10.3.*.* Forward(1)

21.

S1 Flow Table	
Match	Action
IP Src = 10.2.*.*; IP Dst = 10.1.0.1	Forward (2)
IP Src = 10.2.*.*; IP Dst = 10.1.0.2	Forward (3)
IP Src = 10.2.*.*; IP Dst = 10.3.*.*	Forward (1)

S3 Flow Table	
Match	Action
IP Src = 10.2.*.*; IP Dst = 10.3.0.6	Forward (1)
IP Src = 10.2.*.*; IP Dst = 10.3.0.5	Forward (2)
IP Src = 10.2.*.*; IP Dst = 10.1.*.*	Forward (3)