Problem 1

a) Data destined to host H3 is forwarded through interface 3

Destination Address	Link Interface
H3	3

b) No, because forwarding rule is only based on destination address.

Problem 2

a) No, you can only transmit one packet at a time over a shared bus.

b) No, as discussed in the text, only one memory read/write can be done at a time over the shared system bus.

c) No, in this case the two packets would have to be sent over the same output bus at the same time, which is not possible.

Problem 6

a)

Packet Index	Leave queue time	Delay	Average Delay
2	2	2	3.091
3	3	2	
4	4	3	
5	6	3	
6	5	3	
7	7	4	
8	8	3	
9	9	4	
10	10	3	
11	11	3	
12	12	4	

b)

Packet Index	Leave queue time	Delay	Average Delay
2	3	3	3.091
3	2	1	
4	7	6	
5	4	1	
6	8	6	
7	5	2	
8	10	5	

Packet Index	Leave queue time	Delay	Average Delay
9	6	1	
10	11	4	
11	9	1	
12	12	4	

c)

Packet Index	Leave queue time	Delay	Average Delay
2	3	3	3.091
3	5	4	
4	2	1	
5	4	1	
6	7	5	
7	6	3	
8	8	3	
9	10	5	
10	12	5	
11	9	1	
12	11	3	

d)

Packet Index	Leave queue time	Delay	Average Delay
2	3	3	3.091
3	2	1	
4	6	5	
5	4	1	

Packet Index	Leave queue time	Delay	Average Delay
6	8	6	
7	5	2	
8	10	5	
9	7	2	
10	11	4	
11	9	1	
12	12	4	

e) All average delay remains the same, no matter what algorithm is used.

Problem 8

a)

Prefix Match	Link Interface
11100000 00	0
11100000 01000000	1
1110000	2
11100001 1	3
otherwise	3

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

Problem 10

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

Problem 11

223.1.17.0/26

223.1.17.128/25

223.1.17.192/28

Problem 18

a) Home addresses: 192.168.1.1, 192.168.1.2, 192.168.1.3 with the router interface being 192.168.1.4

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

Problem 21

S2 Flow Table	
Match	**Action**
Ingress Port = 1; IP Src = 10.3.*.*; IP Dst = 10.1.*.*	Forward (2)
Ingress Port = 2; IP Src = 10.1.*.*; IP Dst = 10.3.*.*	Forward (1)
Ingress Port = 1; IP Dst = 10.2.0.3 Ingress Port = 2; IP Dst = 10.2.0.3 Ingress Port = 1; IP Dst = 10.2.0.4 Ingress Port = 2; IP Dst = 10.2.0.4	Forward (3) Forward (3) Forward (4) Forward (4)
Ingress Port = 4; IP Dst = 10.2.0.3 Ingress Port = 3; IP Dst = 10.2.0.4	Forward (3) Forward (4)

Problem 24

S2 Flow Table	
Match	**Action**
IP Src = 10.1.0.1; IP Dst = 10.2.0.3	Forward (3)

IP Src = 10.1.0.1; IP Dst = 10.2.0.4	Forward (4)
IP Src = 10.3.0.6; IP Dst = 10.2.0.3	Forward (3)
IP Src = 10.3.0.6; IP Dst = 10.2.0.4	Forward (4)

S2 Flow Table	
Match	**Action**
IP Src =.*.*.*.*; IP Dst = 10.2.0.3; port = TCP	Forward (3)
IP Src =.*.*.*.*; IP Dst = 10.2.0.4; port = TCP	Forward (4)

S2 Flow Table	
Match	**Action**
IP Src =.*.*.*.*; IP Dst = 10.2.0.3	Forward (3)

S2 Flow Table	
Match	**Action**
IP Src = 10.1.0.1; IP Dst = 10.2.0.3; port = UDP	Forward (3)