P1. a) H3 3

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

P2a) No, you can only transmit one packet at a time over a stored bus.

b) No, only one memory read/write can be done at a time.

c) No, two packets cannot be forwarded to the same output bus at the same time.

R22. 32 bit binary for IP address 228.1.3.27 -

11011111 00000001 00000011 00011011.

P11. 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, 128.119.40.112/28

P12 From 214.97.254/23

a) Subnet A supports 250 interfaces - 214.97.255/24 (256 address)

Subnet B supports 120 interfaces. 214.97.254.0/25 - 214.97.254.0/29

Subnet C supports 120 interfaces. 214.97.254.128/25 (128 address)

Subnet D supports 2 interface - 214.97.254.0/31 (2 address)

Subnet E support 2 interface - 214.97.254.2/31 (2 address)

Subnet F support 2 interface - 214.97.254.4/30 (4 address)

b) Router!

Longest Prefix Match				Outgoing Interface
11010110	01100001	11111111		Subnet A
11010110	01100001	1111111 0	00000000	Subnet D
11010110	01100001	1111110	000001	Subnet F

Router 2

Longest Prefix Match	Outgoing Interface
11010110 01100001 11111111 0000000	Subnet D
11010110 01100001 1111110 0	Subnet B
110 10110 01100001 1111110 0000001	Subnet E

Router 3

Longest Prefix Match	Outgoing Interface.
11010110 01100001 11111111 000001	Subnet F
11010110 01100001 1111110 0000001	Subnet E
11010110 01100001 1111110 1	Subnet C

14. maximum size of data field in each fragment = 680

number of required fragments = $\left(\frac{2400-20}{680}\right) = 4$

Each fragment will have Identification number 422.
Each fragment except the last one will be of size 700 bytes.
The last datagram will be of size 360 bytes.
offsets of the 4 fragments will be 0, 85, 170, 255.
Each of the first 13 fragments, will have flag = 1,
last fragment will have flag = 0.

isp

16. a) Home address: 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, 8546
24.34.112.235, 4005	192.168.1.3, 3546