P8.

Destination Address Range	Link Interface
11100000 0000000 00000000 00000000 through 11100000 11111111 11111111 11111111	0
11100001 00000000 00000000 00000000 through 11100001 00000000 11111111 11111111	1
11100001 00000001 00000000 00000000 through 11100001 11111111 11111111 11111111	2
Otherwise	3

a. Provide a forwarding table

Prefix Match	Link Interface
11100000	0
11100001 00000000	1
11100001 00000001	2
Otherwise	3

b. Describe how the forwarding table determines the appropriate link interface for datagrams with destination addresses:

11001000 10010001 01010001 01010101
11100001 00000000 11000011 00111100
11100001 10000000 00010001 01110111

11001000 10010001 01010001 01010101 → Doesn't match any prefix. Takes link interface 3
11100001 00000000 11000011 00111100 → Takes link interface 1 for the first 16 bit matches
11100001 10000000 00010001 01110111 → It doesn't match any prefixes, so take link 3

P11.

A router that interconnects three subnets:
Required prefix 223.1.17/24
Subnet 1 supports 125 interfaces
Subnet 2 supports 60 interfaces
Subnet 3 supports 60 interfaces
Three network address that satisfies these constraints:
223.1.17.0/24
223.1.17.127/24
223.1.17.189/24

P6.

Sending a 3,000 Byte datagram:
Maximum Transfer Unit (MTU) is 500 Bytes.
Stamped Identification Number is 422.
3,000 Byte datagram minus 20 Byte for the IP header data = 2980 Byte of payload data to be sent

The data will be broken down to 7 fragments. Each fragment includes the 20 Byte IP header.

Fragment	Bytes	ID	Offset	Flag
1st fragment	480	422	0	1
2nd fragment	480	422	60	1
3rd fragment	480	422	120	1
4th fragment	480	422	180	1
5th fragment	480	422	240	1
6th fragment	480	422	300	1
7th fragment	100	422	312	0