IP Forwarding. (Peterson 4.38) Shown is a routing table using CIDR. Address bytes are in hexadecimal The notation "/12" in C4.50.0.0/12 denotes a netmask with 12 leading 1 bits, that is, FF.F0.0.0. Note that the last three entries cover every address and thus serve in lieu of a default route.

Net/MaskLength	**Nexthop**
C4.50.0.0/12	A
C4.5E.10.0/20	B
C4.60.0.0/12	C
C4.68.0.0/14	D
80.0.0.0/1	E
40.0.0.0/2	F
00.0.0.0/2	G

(a) **C5.5E.13.87**

(b) **C4.5E.22.09**

(c) **C3.41.80.02**

(d) **5E.43.91.12**

(e) **C4.6D.31.2E**

(f) **C4.6B.31.2E**

Connection management. (Peterson 5.2) Consider a simple UDP-based protocol for requesting files. The client sends an initial file request, and the server answers (if the file can be sent) with the first data packet. Client and server then continue with a stop-and-wait transmission mechanism.

(a) Describe a scenario by which a client might request one file but get another; you may allow the client application to exit abruptly and be restarted with the same port.

(b) Propose a change in the protocol that will make this situation much less likely.

Sliding window. (Peterson 5.9) You are hired to design a reliable byte-stream protocol that uses a sliding window (like TCP). This protocol will run over a 100-Mbps network. The RTT of the network is 100 ms, and the maximum segment lifetime is 60 seconds.

(a) How many bits would you include in the AdvertisedWindow and SequenceNum fields of your protocol header?

(b) How would you determine the bandwidth, RTT, and MSL given above, and which values might be less certain?