1. DNS uses UDP instead of TCP. If a DNS packet is lost, there is no automatic recovery. Does this cause a problem, and if so, how is it solved?
2. Can a machine with a single DNS name have multiple IP addresses? How could this occur?
3. From an ISP’s point of view, POP3 and IMAP differ in an important way. POP3 users generally empty their mailboxes every day. IMAP users keep their mail on the server indefinitely. Imagine that you were called in to advise an ISP on which protocol it should support. What considerations would you bring up?
4. SMTP involves the exchange of several small messages. In most cases, the server responses do not affect what the client sends subsequently. The client might thus implement command pipelining: sending multiple commands in a single message. For what SMTP commands does the client need to pay attention to the server’s responses?
5. Suppose within your web browser you click on a link to obtain a web page. Suppose that the IP address for the associated URL is not cached in your local host, so that a DNS look up is necessary to obtain the IP address. Suppose that n DNS servers are visited before your host receives the IP address from DNS; the successive visits incur a RTT of RTT_1, ..., RTT_n. Further suppose that web page associated with the link contains exactly one object, a small amount of HTML text. Let RTT_0 denote the RTT between the local host and the server containing the object. Assuming zero transmission time of the object, how much time elapses from when the client clicks on the link until the client receives the object.
6. True or false.
   a) Suppose a user requests a Web page that consists of some text and two images. For this page the client will send one request message and receive three response messages?
   b) True or false. Two distinct Web pages (e.g., www.mit.edu/research.html and www.mit.edu/students.html) can be sent over the same persistent connection?
c) With non-persistent connections between browser and origin server, it is possible for a single TCP segment to carry two distinct HTTP request messages?

d) The *Date:* header in the HTTP response message indicates when the object in the response was last modified?