Total points = 10

Question 1 (2 points)

a) For a given input of domain name (such as ccn.com), IP address or network administrator name, whois database can be used to locate the corresponding registrar, whois server, DNS server, and so on.
f) An attacker can use the whois database and nslookup tool to determine the IP address ranges, DNS server addresses, etc., for the target institution.
g) By analyzing the source address of attack packets, the victim can use whois to obtain information about domain from which the attack is coming and possibly inform the administrators of the origin domain.

Question 2 (2 points) Please refer to the Syllabus.

Question 3 (2 points) Please refer to the Syllabus.

Question 4 (1 point)

To best answer this question, consider why we needed sequence numbers in the first place. We saw that the sender needs sequence numbers so that the receiver can tell if a data packet is a duplicate of an already received data packet. In the case of ACKs, the sender does not need this info (i.e., a sequence number on an ACK) to tell detect a duplicate ACK. A duplicate ACK is obvious to the rdt3.0 receiver, since when it has received the original ACK it transitioned to the next state. The duplicate ACK is not the ACK that the sender needs and hence is ignored by the rdt3.0 sender.

Question 5 (1 point)

The sender side of protocol rdt3.0 differs from the sender side of protocol 2.2 in that timeouts have been added. We have seen that the introduction of timeouts adds the possibility of duplicate packets into the sender-to-receiver data stream. However, the receiver in protocol rdt.2.2 can already handle duplicate packets. (Receiver-side duplicates in rdt 2.2 would arise if the receiver sent an ACK that was lost, and the sender then retransmitted the old data). Hence the receiver in protocol rdt2.2 will also work as the receiver in protocol rdt 3.0.

Question 6 (1 point) Please refer Figure 1.

Question 7 (1 point) It takes 8 microseconds (or 0.008 milliseconds) to send a packet. in order for the sender to be busy 90 percent of the time, we must have util = 0.9 = (0.008n) / 30.016 or n approximately 3377 packets.

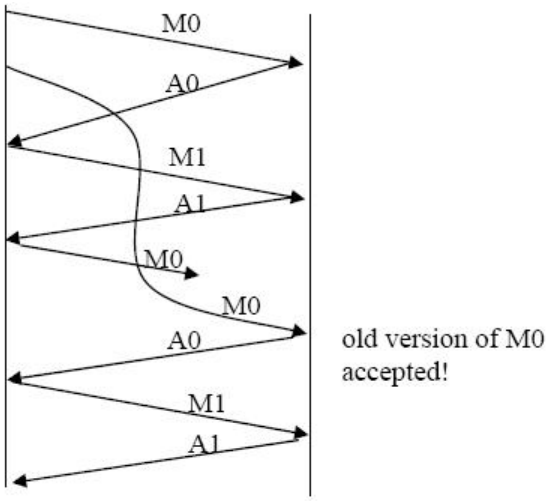

Figure 1: Problem 6