Spring 2014
Computer Networks
CMPE323

Quiz 2

Questions	Points
Q1	/80%
Q2	/20%

Student name: **Student ID:**

Question 1:

Consider Figure 1 where the network is correctly configured to allow PC1 and PC2 to communicate.

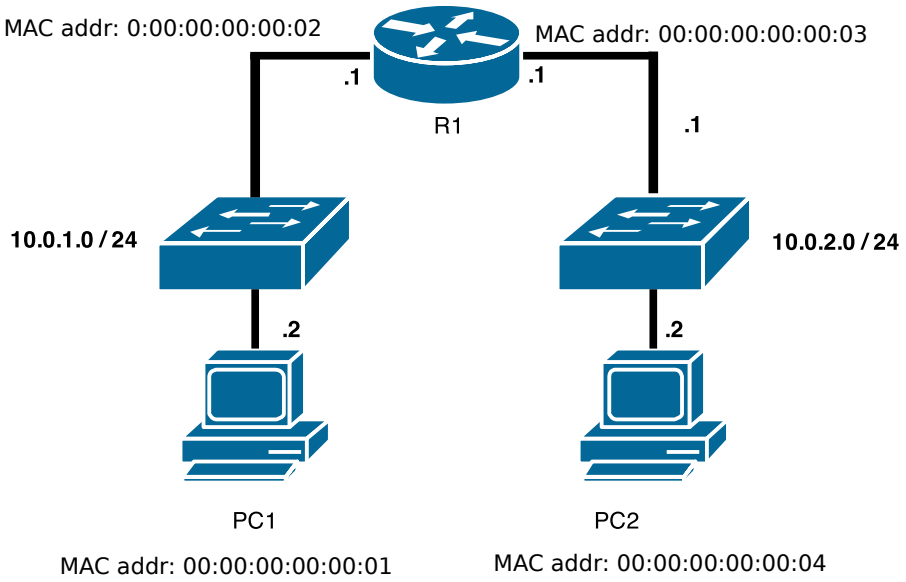

Figure 1: Two PCs in two broadcast domains that are interconnected by a single router.

Additionally, suppose that PC1 initiated some TCP connection against PC2's port 80. The dynamically chosen source port number by PC1 was 40,000. The TCP three-way hand-shake has progressed so far as depicted in Figure 2.

```
   PC 1                                                    PC 2
1. CLOSED                                                  LISTEN
2. SYN-SENT     --> <SEQ=1><CTL=SYN>                  --> SYN-RECEIVED
3. ESTABLISHED <-- <SEQ=300><ACK=2><CTL=SYN,ACK>      <-- SYN-RECEIVED
4. ESTABLISHED -->                ???                 --> ESTABLISHED
```

Figure 2: TCP's three-way hand-shake for connection establishment between PC1 and PC2.

The question is: what data should PC1 send to PC2 in order to complete the TCP three-way hand-shake (i.e. step 4 from Figure 2). Answer this question by filling the Figures 3, 4 and 5 in the next page as follows:

- Only fill fields that are marked by an asterisk "`*`", and ignore the others.
- The protocol type for IP is `0x0800`.
- The protocol type for TCP is `0x06`.

Grading scheme: every field that is correctly filled rewards you with 5 points. I.e. correctly filling all of the 16 fields will give you $5 \times 16 = 80$ points.

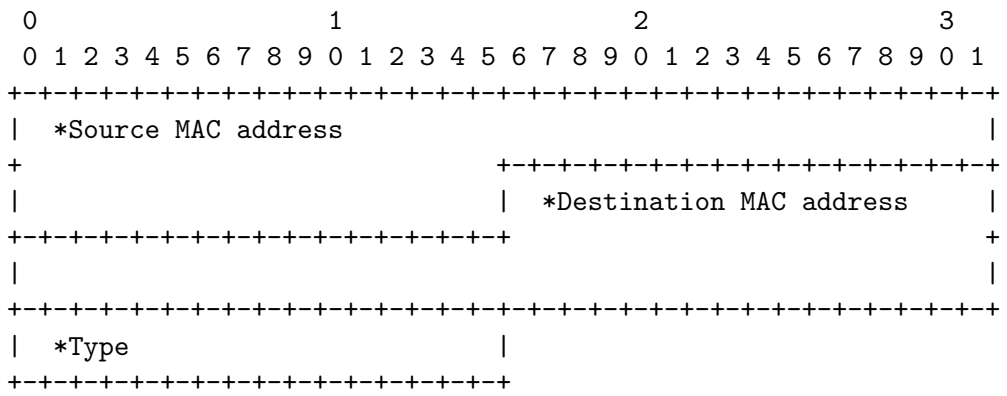

Figure 3: Ethernet frame (only fill the value of fields that are marked with an asterisk "*").

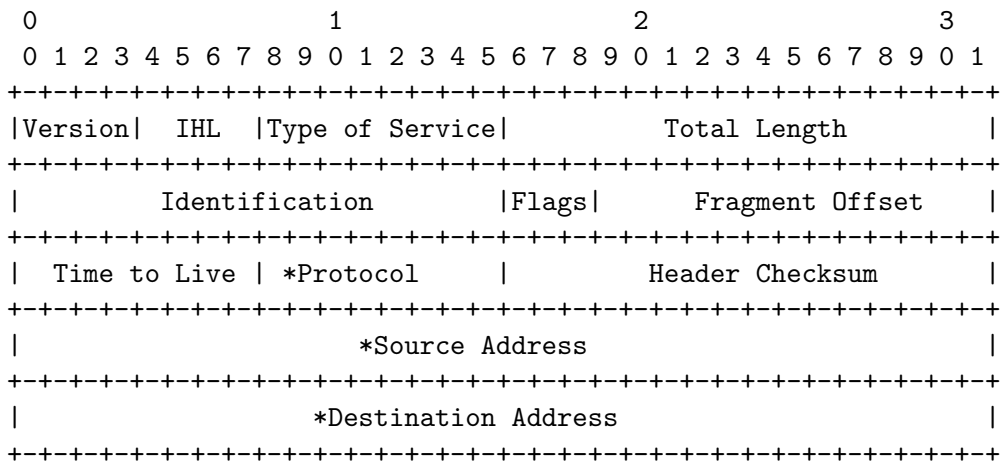

Figure 4: IPv4 header (only fill the value of fields that are marked with an asterisk "*").

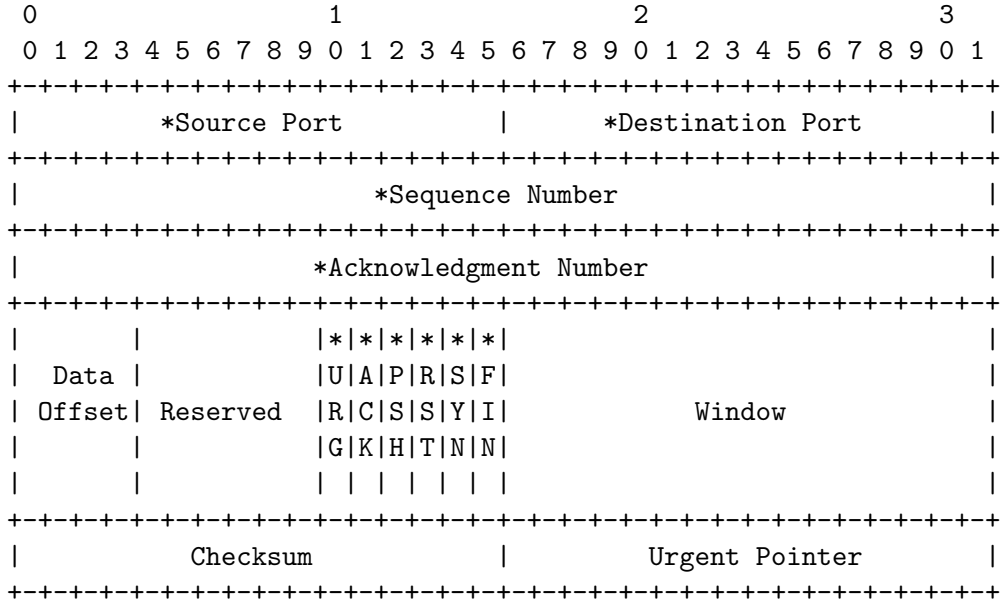

Figure 5: TCP header (only fill the value of fields that are marked with an asterisk "*").

Question 2:

Following the scenario in Figures 1 and 2, and in the context of TCP communication, how would PC2 behave if it did not receive an `ACK` message from PC1 for a relatively long time period?