question 1

Routing table entries do not have an explicit expiry algorithm: once an entry is in the table, it will stay there forever unless deleted by **ICMP** (or manually, etc.). List 2 **relevant** pros and cons of adding an additional column in the table:

Time last used

Pro 1:

Pro 2:

Con 1:

Con 2:

Question 2

True or false:

( ) IPv4 has addresses that are 4–byte long.

( ) IPv6 has addresses that are 6–byte long.

( ) The subnet mask of $202.33.44.128/25$ is $255.255.255.128$.

( ) There are two variants of the **silly window** scenario: *sender produces data too slowly* or *receiver removes data from buffers too slowly*.

( ) **ICMP** sends a report when a datagram is dropped because the destination host is unreachable.

( ) CSMA/CD is a protocol used by the Physical Layer.

( ) IPv6 has addresses long enough so that there is no need to specify port numbers in IPv6.

( ) ICMP sends its reports inside UDP datagrams.

( ) Datagrams are reassembled at the destination host and never by intermediate routers.

( ) A router must have at least 2 different **IP** addresses.

( ) the **MF** flag is part of a **TCP** header and it means that the connection must be terminated immediately.

Question 3

I.P. Veafore proposes to add a special flag to **IP**. This flag, using the reserved (i.e. unused) flag bit next to **DF** and **MF** will be called **RST** and will signal abandoning (and restarting) the transfer of the currently transmitted multi–fragment datagram.

Comment on the usefulness of this idea.

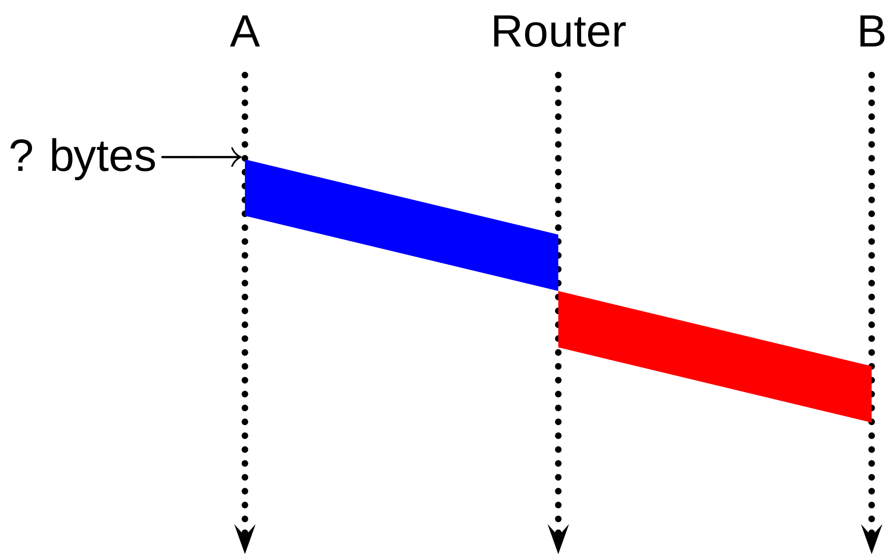
Question 4

Suppose two nodes, $\mathcal{A}$ and $\mathcal{B}$ are connected by a sequence of 2 links, operating at 100 Mb/s and 300 Mb/s, respectively. The length of each link is 200m (the propagation delay is $10^{-6}s$ for each link). There is a router between the two links links; the router uses store–and–forward to route packets. The router has very large buffers and is infinitely fast.

$\mathcal{A}$ sends a file of length 10,000 bytes using **UDP**. The TL protocol enforces a maximum segment size of 1008 bytes (header included). The sender's IP protocol allows datagrams up to 2000 bytes long; the intermediate router fragments datagrams longer than 576 bytes into fragments of size not exceeding 576 (**including the fragment header!!!**).

If all the transmissions are successful, how many bytes will reach $\mathcal{B}$? How much time will elapse before $\mathcal{B}$ can start to reassemble the original file?

Assume that there are no processing or queuing delays.


A
Router
B
? bytes

Question 5

A router receives a datagram with a destination address of $123.123.123.123$. The router's routing table does not have a matching entry for this address. What can the router do (besides dropping the datagram)?

Question 6

A program decides to read a **UDP** datagram but wants to make sure that the function returns after no more than 30 seconds.

How can one implement that?