**CS5222 Assignment 2 (Sem A, 2025-26)**

Chapter 3

P8. Draw the FSM for the receiver side of protocol `rdt3.0`.

P22. Consider the GBN protocol with a sender window size of 4 and a sequence number range of 1,024. Suppose that at time $t$, the next in-order packet that the receiver is expecting has a sequence number of $k$. Assume that the medium does not reorder messages. Answer the following questions:

a. What are the possible sets of sequence numbers inside the sender's window at time $t$? Justify your answer.

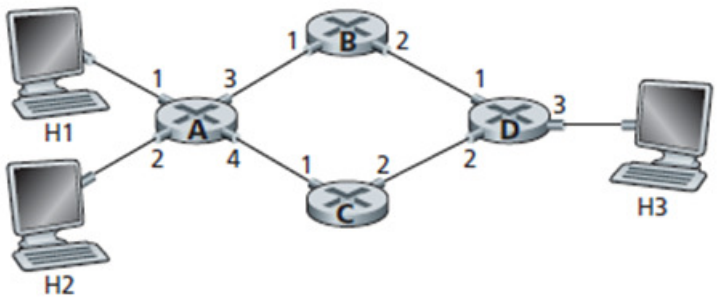
b. What are all possible values of the ACK field in all possible messages currently propagating back to the sender at time $t$? Justify your answer.

Chapter 4 & 5

P4. Consider the network below.

a. Suppose that this network is a datagram network. Show the forwarding table in router A, such that all traffic destined to host H3 is forwarded through interface 3.

b. Suppose that this network is a datagram network. Can you write down a forwarding table in router A, such that all traffic from H1 destined to host H3 is forwarded through interface 3, while all traffic from H2 destined to host H3 is forwarded through interface 4? (Hint: this is a trick question.)



**Paper reading**

Please read the paper “S. Savage *et al*., "Detour: informed Internet routing and transport," in *IEEE Micro*, vol. 19, no. 1, pp. 50-59, Jan.-Feb. 1999, doi: 10.1109/40.748796” and answer the following questions.

According to this paper:

1) What are the inefficiencies in the network-layer protocol?
2) What are the inefficiencies in the transport-layer protocol?
3) How to address these inefficiencies?

(**Note**: Please do not copy and paste the answers directly from the paper. Rather, we hope that you apply the knowledge you learn from this course to enrich your discussion here.)