

Tutorial 1:

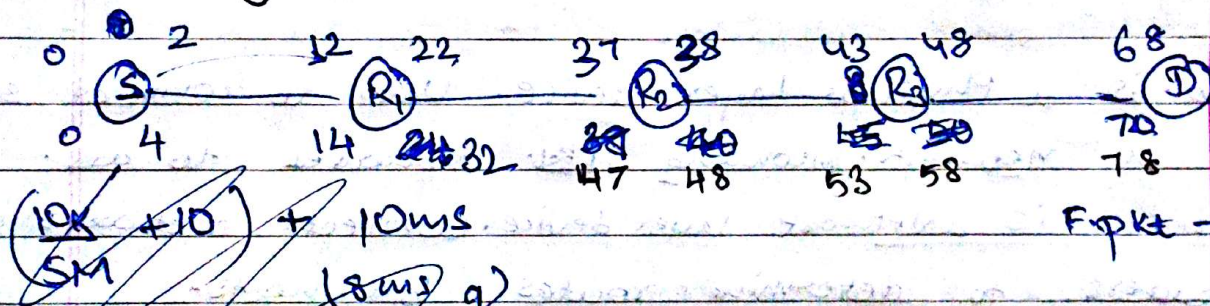
1. • For small messages, too much address bits. High energy usage.
 - Performance suffers as application is bound to work on constraints set by others. Might have to compromise on efficiency.
2. • On failure, resend. (If packet too large, ...) Hence, can get very inefficient.
 - Too small - overhead is too high.
 - Too large - multiplexing affected. Network clogged.
3. • Hub is a Physical Layer device. Used to connect segments of a network. Incoming packets forwarded to all.
 - Router is a Network Layer device. Connects networks. Use headers to determine routes b/w hosts.
4. • More the transmission/reception energy, better is performance and low bit-error. \propto (Bit loss with dist.)
5. • - Traffic / failure at a hop and plan @ source fails.
 - Security affected.
7. • Throughput makes sense only for amount of data tending to infinity, as for small packets, prop. delays matter. Let this be 2 Mbps.

The throughput will depend on the bottleneck of the network and hence $4p = 1 \text{ Mbps}$

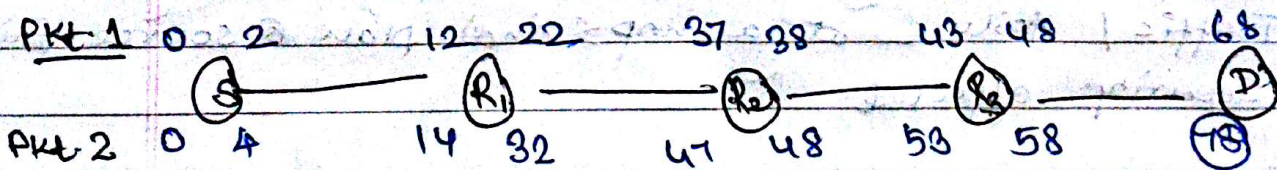
8. (Considering Store-and-forward)

$$\begin{aligned} \text{ms) time} &= 10 + \frac{10K}{5M} + 15 + \frac{10K}{1M} + 5 + \frac{10K}{10M} + 20 + \frac{10K}{2M} \\ &= 50 + 2 + 10 + 1 + 5 = \underline{\underline{68 \text{ ms}}} \end{aligned}$$

9. (Considering Store-and-forward)



12ms + 10ms + 15ms + Queuing delay only at R_1 .
(-5ms)



Total Time: 78ms

6.