Assignment-12

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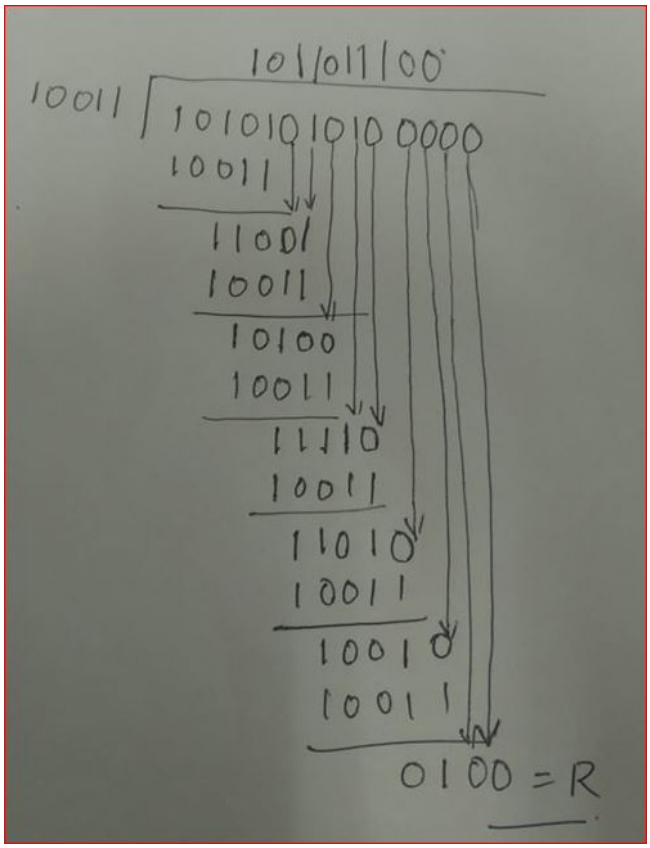
1 Question -1

For a CRC-based error detection scheme, Consider the 7-bit generator, G=10011, and suppose that D has the value 1010101010. What is the value of R?

- If we divide 10011 into 1010101010 0000, we get 1011011100, with a remainder of R=0100.



2 Question -2

Consider a broadcast channel with N nodes and a transmission rate of R bps. Suppose the broadcast channel uses polling (with an additional polling node) for multiple access. Suppose the amount of time from when a node completes transmission until the subsequent node is permitted to transmit (that is, the polling delay) is $d_(poll)$. Suppose that within a polling round, a given node is allowed to transmit at most Q bits. What is the maximum throughput of the broadcast channel?

- Throughput is given by: Data Transmitted in one round/ Time to complete one round
- N * Q/(N * (d + Q/R))= Q/(d + Q/R)

3 Question -3

Suppose nodes A and B are on the same 10 Mbps broadcast channel, and the propagation delay between the two nodes is 325 bit times. Suppose CSMA/CD and Ethernet packets are used for this broadcast channel. Suppose node A begins transmitting a frame and, before it finishes, node B begins transmitting a frame. Can A finish transmitting before it detects that B has transmitted? Why or why not? If the answer is yes, then A incorrectly believes that its frame was successfully transmitted without a collision. Hint: Suppose at time t = 0 bits, A begins transmitting a frame. In the worst case, A transmits a minimum-sized frame of 512 + 64 bit times. So A would finish transmitting the frame at t = 512 + 64 bit times. Thus, the answer is no, if B's signal reaches A before bit time t = 512 + 64 bits. In the worst case, when does B's signal reach A?

- When t = 0, A begins transmitting.
  At t = 512+64 bit time, A finished transmitting.
  The worst case, B begins transmitting at t = 324 (just before the first bit of A arrives to B)
  At t = 324+325=649, the first bit of B arrives to A.
  Since 649 > 576, so A accomplished transmitting before B starts transmitting. This means A will think its frame was transmitted successfully without collision.