6. a) What are the differences between synchronous and asynchronous communication? Why is one or the other preferable?

   b) What is the relationship between the Hamming distnace of a code (d) and its ability to detect errors? Correct errors?

   c) What is the residual error rate of an error-detecting code? Why is it important?

   d) What is LRC and why is it used?

7. a) Given $P=x^4+x+1$, compute the FCS for message M=101101101 using CRC.
   b) What is transmitted?
   c) Show the shift register implementation of this coding, and explain its operation.

8. a) What is the Hamming distance of this code: {0000, 1100, 0011, 1111}.

   b) If the following is a 15-bit Hamming code using even parity, is there an error? If so, where?

   1 0 1 1 0 1 1 0 0 0 1 0 1 0 1
   bit: 15 1

   c) What is the (corrected) message?

BONUS - What is the difference between balanced and unbalanced transmission? Which is better, and why?

SIGN HERE: I have not discussed the contents of this test with anyone who was taking it, nor anyone who took it before I did, nor will I discuss it with anyone who has not taken it until they have turned it in. I have received no help on this test from others. SIGNED & DATED: _____