1) A convolutional coder of rate ½, constraint length =3, and with generator polynomial g_0 =101 and g_1 =111 has been used to encode the data 100111, what is the output of the encoder. (assume the first input bit is the left most bit) and the coder starts with 1 in both stages. (6 degree)

Input	→	output
100111	→	01 10 ------

2) The code sequence below is from a code with DSV of 6. Fill the following table, assuming initial RDS=0. (4 degree)

code	DSV	Contain error?
++-- --+- --++		
-+++ -+++ ----		

3) For a (7,4) CRC code with G(x)= $(11)_{10}$ and a message vector is $(12)_{10}$. A single error occurred at X^6. Determine:

I. The transmitted code.

II. The remainder at the receiver. (5 degree)