Problem topic 4

1. Give the real numbers that correspond to the following floating point IEEE754 standard representation in 32 bits.

0	1 0 0 0 0 0 0 0	1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

1	0 0 0 0 0 0 0 0	0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

2. Represent the following numbers in floating point IEEE754 standard in 32 bits.

-0.5625
$+ 2^3 + 2^{10}$

3. Generate for the integer value 6 its BCD representation coded in Hamming-SEC.

D_7	D_6	D_5	P_4	D_3	P_2	P_1

A sender which can at most generate single errors provides us with a Hamming-SEC word of seven bits that corresponds to a BCD digit. It was found that the parity tests for P1 and P2 (C1 and C2) failed and we know that the correct BCD value should be five.
Provide the received Word.

D_7	D_6	D_5	P_4	D_3	P_2	P_1

4. Represent the following integer numbers in 8 bits according the indicated system. Indicate if you think the number cannot be represented.

number	unsigned	S-M	BCD	2C	Excess 64
35					
-96					

5. Given the following two bit strings. Determine the integer value they represent according to the indicated system. If you think the bit string does not represent a number in the system, indicate that.

string	unsigned	S-M	2C	Excess 128	BCD
10101010					
01010101					

6. The following bit strings represent BCD digits coded in Hamming SEC-DED ($x_7x_6x_5p_4x_3p_2p_1p$). Determine, whether an error occurred in one or two bits (ignoring the possibility of 3 bit errors). If possible, give the correct BCD digit sent out ($x_7x_6x_5x_3$).

Bit string $x_7x_6x_5p_4x_3p_2p_1p$	Nº of errors	Error bits	correct BCD digit $x_7x_6x_5x_3$
00001111			
01101000			