Subject

Perform the following operations:

(0.75p) 1. $33221100_{(4)} + 123032122_{(4)} = ?_{(4)}$

(0.75p) 2. $1230056_{(7)} - 445566_{(7)} = ?_{(7)}$

(0.75p) 3. $ABCDE1_{(16)} * 7_{(16)} = ?_{(16)}$

(0.75p) 4. $54321_{(6)} : 3_{(6)} = ?_{(6)}$ remainder $?_{(6)}$

(3p) 5. Convert the number 12345,04 from base 6 into base 8 with 2 digits on the fractional part. Explain the chosen method.

5. Convert the number ABCDE,1234 from base 16 into base 4 and the number 11223300 from base 4 into base 8. Explain the chosen method.

(3p) 6. Floating point representation of real numbers: theory.
Represent in single precision with a mantissa >1 the number -3456,78.

6. Codes (direct, inverse, complementary) for signed subunitary numbers: theory and example for the number -0,241, representation on 16 bits.

6. Addition and subtraction in complementary code for signed integers: theory.
Examples for 55+91, 55-91 and -91-55, representation on 8 bits.

6. Fixed point representation for real numbers: theory.
Represent in fixed point notation on 32 bits the number -4501,33.

6. Floating point representation of real numbers: theory.
Represent in single precision with a subunitary mantissa the number 0,023.

6. Codes (direct, inverse, complementary) for signed integers: theory and example for the number 12345, representation on 16 bits.

6. Addition and subtraction in complementary code for subunitary numbers: theory.
Examples for $-\frac{7}{16} - 0{,}71$ and $\frac{7}{16} - 0{,}71$, representation on 16 bits.