

4.3 Floating Point Arithmetic (Multiplication) (4 points)

Let the following two 32-Bit Floating Point Numbers FPN1 and FPN2 be given. Both numbers are in IEEE 754-1985 standard. Carry out the following calculation without converting the numbers into decimal numbers! Specify the result as displayed in the definition of FPN1 and FPN2 (s=Signum, e=Exponent, m=Mantisse). You will get 1 point for the correct result. You will get the other 3 points, if you present the steps of calculation in an understandable way.

FPN1: 1 1000 0111 110 1000 0000 0000 0000 0000

FPN2: $\underbrace{1}_s \underbrace{1000\ 0101}_e \underbrace{101\ 0000\ 0000\ 0000\ 0000\ 0000}_m$

Calculate $FPN1 \cdot FPN2$.

4.4 KV-Diagrams (4 points)

Let the following functions $f_1 : B^4 \rightarrow B$ and $f_2 : B^4 \rightarrow B$ be given by their respective vectors of values. Draw the related KV-Diagrams. Use these KV-Diagrams to find ALL prime implicants of both functions and write down the corresponding monomials.

- $f_1(x_1, x_2, x_3, x_4)$ is given by: (1,1,1,1, 1,1,1,1, 0,0,0,1, 0,0,0,1)
- $f_2(x_1, x_2, x_3, x_4)$ is given by: (1,1,0,1, 0,1,0,1, 1,0,1,0, 1,1,1,1)

Notes:

Submission until Wednesday, 18th November 2015, 16:00 pm in the mailbox number 46 at Otto-Hahn-Straße 12.

You can find the mailboxes in the first floor of the Otto-Hahn-Straße 12 near the transition to the ground floor of the Otto-Hahn-Straße 14. The mailboxes are labeled with "Rechnerstrukturen", the exercise group number and time/place of the exercise. The English exercise group is number 30 and the mailbox is number 46.

Please write your **name**, your **student registration number** and your **exercise group number** at the top right corner of your submission. You can make submissions in teams with up to two more students. To make a team submission put names, student registrations numbers and group numbers of all members of the team on the submission. Only one submission per team has to be made.

Tack you submission. Please do not fold your submission and do not put it into an envelope. Use the correct mailbox, you will need your exercise group number for that.

In total there are 12 exercises in 3 blocks (A, B, C). In each block you have to achieve at least 30 points of 64 possible ones to get access to the exam.