

# Subject 2

$$X_{hex} = 431D30B0$$

$$X_{hex} = X_2 = \begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline X_s & & & & & & X_E & & & & & & & & & & & X_M \\ \hline 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ \hline \end{array}$$

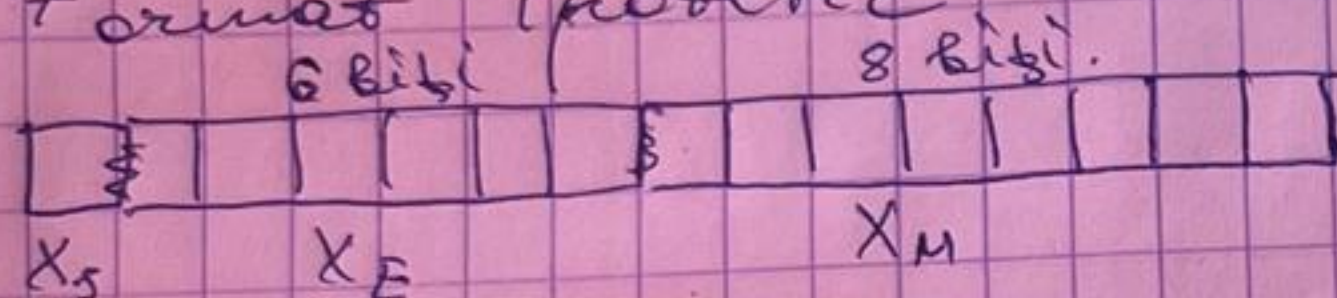
$$67 = X_E \Rightarrow X_E - 64 = 3$$

$$X_{IBM} = (-1)^0 \cdot 16^3 \cdot 0,00011101001100001011 =$$

$$= +111010011,00001011 \Leftrightarrow$$

$$X_{10} = +467,04296875_{10}$$

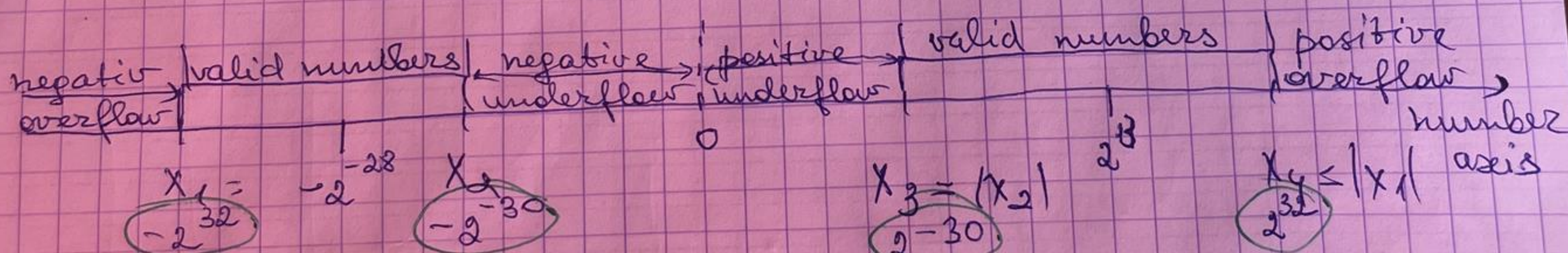
## p) Format ipotetic



- sign - 0, pentru numere > 0  
          1, pentru numere < 0

- exp. - 6 biti
  - bias =  $2^5 - 1 = 31$
  - poate avea valori de la 1 la 63
  - 0 și 63 sunt speciale
    - ↓ denorm
    - ↓ NaN

- mantisa → normalizarea conduce la "hidden bit"



$$X_1 = \begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 \\ \hline \end{array}$$

$$X_1 = (-1)^1 \cdot 2^{62-31} \cdot \left(1 + \frac{1}{2} + \frac{1}{4} + \dots + \frac{1}{2^8}\right) = -2^{31} \cdot \frac{512}{256} =$$

$$= -2^{32} = -10^{9,6}$$

$$\begin{array}{r} 10 \dots 3 \\ 32 \dots x \\ \hline x = 9,6 \end{array}$$

$$X_2 = \begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|} \hline 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \dots 3 \\ -30 \dots x \\ \hline x = -9 \end{array}$$

$$X_2 = (-1)^1 \cdot 2^{1-31} \cdot (1 + 0 + 0 + 0 + 0 + 0) = -2^{-30} = -10^{-9}$$