Solution to Question 1

Binary representation of the number -12.125 according to IEEE 754 single-precision

Sign	Exponent	Mantissa
1	10000010	10000100000000000000000

Explanation

Sign Bit

0 = positive.
1 = negative.

The given number is negative, therefore the sign bit is 1.

Whole Number Portion Conversion

Whole number portion = 1100_2

Decimal Number Portion Conversion

Decimal number portion = 001_2

Decimal Number Multiplication	Result	Whole Number Portion
$0.125 \cdot 2$	0.25	0
$0.25 \cdot 2$	0.5	0
$0.5 \cdot 2$	1	1
$0 \cdot 2$	0	0

Result: 1100.001_2 → Move by 3 decimal places → $1.100001_2 \cdot 2^3$
Exponent: $127 + 3 = 130$ (10000010_2)
Mantissa = $10000100000000000000000_2$