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10619

(1) Numerical Computes
LAB#01

Q.

(a) Find how 0.02832 will be represented in the floating point 10 bit word?

(b) What is the decimal equivalent of the 10 bit word representation of part(a)?

(a)

Integer part = 0
fractional part = 0.02832

Integer part $(0)_{10} = (0)_2$

Fractional Part Iterations:

0.02832x2
0.05664x2
0.11328x2
0.22656x2
0.45312x2
0.90624x2
1.81248x2
1.62496x2
1.24992x2
0.49984x2

(2)

0.99968×2
$\Rightarrow 1.99936$

$(0.02832)_{10} \cong (0.0000011100 1)_2$
$= (1.11001)_2 \times 2^{-6}$
$\cong (1.1100)_2 \times 2^{-6}$

* Calculating binary equivalent:

	Quotient	Remainder
6/2	3	0
3/2	1	1
1/2	0	1

$(6)_{10} = (110)_2$
$(0.02832)_{10} = (1.1100)_2 \times 2^{-(110)_2}$
$= (1.1100)_2 \times 2^{-(0110)_2}$

Therefore, the ten bit representation would be:
0101101100

Ans.

(b) $(1.1100)_2 \times 2^{-(0110)_2}$
$= (1\times2^0 + 1\times2^{-1} + 1\times2^{-2} + 0\times2^{-3} + 0\times2^{-4}) \times 2^{-(0\times2^3 + 1\times2^2 + 1\times2^1 + 0\times2^0)}$
$= (1.75)_{10} \times 2^{-(6)_{10}}$
$= 0.02734375$

Ans.