LAB 3

① Representing $(1.5)_{10}$ and $(1.05)_{10}$ in base-2.

Sol:

(a) $(1.5)_{10} = (?)_2$

* The integer part $(1)_{10}$ gives $(1)_2$ since

$$\begin{array}{r|l} 1 & 2 \\ -0 & 0 \\ \hline 1 & \end{array}$$

* The decimal part $(0.5)_{10}$ gives:

$0.5 \times 2 = 1$

Therefore, $(1.5)_{10} = (1.1)_2$

(b) $(1.05)_{10} = (?)_2$

* The integer part $(1)_{10}$ gives $(1)_2$ since:

$$\begin{array}{r|l} 1 & 2 \\ -0 & 0 \\ \hline 1 & \end{array}$$

* The decimal part $(0.05)_{10}$ gives:

$0.05 \times 2 = 0.1$; keep (0).

$0.1 \times 2 = 0.2$; " (0)

$0.2 \times 2 = 0.4$; " (0)

$0.4 \times 2 = 0.8$; " (0)

$0.8 \times 2 = 1.6$; keep (1)

$0.6 \times 2 = 1.2$; " (1)

$0.2 \times 2 = 0.4$; " (0)

↓ repeats

therefore, $(0.05)_{10} = (0.0000110\ldots)_2$

This means that; $(1.05)_2 = (1.0000110\ldots)_2$

② (a) $(1.5)_{10} = (?)_2$

Solution: Given $n = 3$;
the floating point $(0.5)_{10}$ gives;

$0.5 \times 2 =$ ① ; Hence, $(0.5)_{10} = (0.1)_2$

$(1.5)_{10} = (1.1)_2$ since the int

(b) $(5.5)_{10} = (?)_2$

Sol: floating point (0.5)