

## Lab 2 Conversions Base 2, 8, 10, 16

1.  $0.25_{10} = 0.25 \times 16 = 4.0$

$$= 0.416$$

$$0.4_{16} = .0100_2$$

$$\begin{array}{r} 0.010000 \\ \underline{\phantom{0.010000}} \\ 2 \quad 08 \end{array}$$

$$.0100_2 = \boxed{0.2_8}$$

$$2. \quad 0.25_8 = . \underset{010}{2} \underset{101}{5}$$

$$= \boxed{.010101_2}$$

$$\begin{array}{r} \cdot \overline{010100} \mid_2 \\ \quad \underline{\phantom{0}5} \quad \underline{\phantom{0}4} \end{array}$$

$$= \boxed{.54_{16}}$$

$$.54_{16} = 5 \times 16^{-1} + 4 \times 16^{-2} =$$

$$= \frac{3}{16} + \frac{4}{16^2}$$

$$= \frac{16.5}{16^2} + \frac{4}{16^2}$$

$$= \frac{84}{162}$$

$$= \frac{84}{256}$$

$$0.328125_{10}$$

$$3 \quad 0.25_{16} = \begin{matrix} 2 & 5 \\ 0010 & 0101_2 \end{matrix}$$

$$= \boxed{0.00100101_2}$$

$$0.\overbrace{0010}^1 \overbrace{0101}^1_2$$

$$= \boxed{0.1128}$$

$$= \frac{3}{16} + \frac{5}{16^2}$$

$$= \frac{32}{256} + \frac{5}{256}$$

$$= \frac{37}{256} \approx \boxed{0.14453125_{10}}$$

$$4. \quad 0.1101_2$$

$$0.\overbrace{1101}^{13/16}$$

$$= \boxed{0.8125_{10}}$$

$$0.\overbrace{1101}^{6/8} \overbrace{00}^{4/8}$$

$$= \boxed{0.648}$$

$$= \frac{13}{16} = \boxed{0.8125_{10}}$$

$$\frac{6.8}{82} + \frac{4}{8} = \frac{52}{64} = 0.8125_{10} \quad \checkmark$$