

Name: \_\_\_\_\_

**Problem 1:**Convert  $48.5_{10}$  to (a) binary (b) hexadecimal and (c) octal(a)  $110000.1$       (b)  $30.8$       (c)  $60.4$ **Problem 2**

(a) Add in binary

$$\begin{array}{r} 011101 \\ + 001011 \\ \hline 101000 \end{array}$$

(b) Subtract using 2's complement

$$\begin{array}{r} 00101 \quad \text{With addition} \\ - 01010 \\ \hline 00101 \\ + 10010 \\ \hline 11011 \end{array}$$

(c) Multiply in binary

$$\begin{array}{r} 0111 \\ \times 0011 \\ \hline 0111 \\ 0111 \\ \hline 0010101 \end{array}$$

**Problem 3**

Reduce the following expression for F using Boolean Algebra

$$F = \overline{A}BC + A\overline{B}C + \overline{A}B\overline{C} + ABC + \overline{A}B\overline{C} + \overline{A}B\overline{C}$$

$$= \overline{A}(\underbrace{\overline{B}\overline{C} + \overline{B}C + B\overline{C} + BC}_1) + AC(\underbrace{B + \overline{B}}_1)$$

$$= \overline{A} + AC$$

$$= \overline{A} + C$$