

Name: _____ Date: _____

Quiz 1 Median: 8.0/10

1. Calculate the decimal value of 156_7 . Show your work.

$$1 \times 7^2 + 5 \times 7 + 6 \times 7^0 = 90$$

2. Convert the two numbers to

hexadecimal, octal, and binary:

$$\begin{array}{r}
 0r1 \\
 8 \overline{)1} \\
 \\
 0r3 \quad 1r5 \\
 16 \overline{)3} \quad 8 \overline{)13} \\
 \\
 3rB \quad 13r3 \\
 16 \overline{)59} \quad 8 \overline{)107} \\
 \\
 59r6. \quad 107r1. \\
 16 \overline{)950} \quad 8 \overline{)857}
 \end{array}$$

950 3B6, 1666, 0011 1011 0110

857 359, 1531, 001 101 011 001

3. Compute $950 - 857$ using 2's complement addition. Use 12 bits for your word size. Show your work.

$$\begin{array}{r}
 0011\ 1011\ 0110 \\
 + \quad 1100\ 1010\ 0111 \\
 \hline
 1\ 0000\ 0101\ 1101 \\
 \Rightarrow 1 \times 2^6 + 1 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^0 = 64 + 16 + 8 + 4 + 1 = 93 \checkmark
 \end{array}$$

4. Convert 123.015_{10} to binary. Show your work

$$\begin{array}{l}
 123 / 16 = 7 \text{ r } \underline{B}, \quad 7 / 16 = 0 \text{ r } \underline{7} \\
 16 \times .015 = \underline{0.24}, \quad 16 \times .24 = \underline{3.84}, \quad 16 \times .84 = \underline{D.44}, \quad 16 \times .44 = \underline{7.04} \\
 7B.03D7_{16} = 0111\ 1011.0000\ 0011\ 1101\ 0111
 \end{array}$$

5. Complete the values table for the following algorithm with $a[] = \{1, 5, 6\}$, $s = 7$, and $\text{length} = 3$.

```

int decimalValue (int a[], int s, int length) {
    int i, n = 0;
    for (i = 0; i < length; i++) {
        n += a[length - 1 - i] * pow(s, i);
    }
    return n;
}

```

i	a[length - 1 - i]	pow(s, i)	a[length - 1 - i] * pos(s, i)	n
0	6	1	6	6
1	5	7	35	41
2	1	49	49	90
3				