ACSL

2005 - 2006 **American Computer Science League** **Contest #2**

Intermediate Division

1. Bit-String Flicking

A new operation CAT-S,L is defined as follows: Concatenate the bits starting in location S with a length of L to the right-hand side of the original string. Evaluate:

(RCIRC - 3 (LSHIFT – 4 (CAT – 2,3 0110111)))

1.

2. Bit-String Flicking

Evaluate:

(RCIRC–2 (LSHIFT–1(NOT 01101))) OR (RSHIFT-3 (LCIRC-2 11100))

2.

3. Boolean Algebra

Simplify:

$$\overline{(A+\overline{B})}(A\overline{B}+C)(B+\overline{C})$$

3.

4. Boolean Algebra

How many ordered triples make the following expression TRUE?

$$(\overline{A}+\overline{B})\overline{C}+\overline{A}(B\overline{C}+A)+\overline{(C+A)}(\overline{A}B)$$

4.

5. Computer Number Systems

Place the following numbers in descending order with respect to the number of 1's in their binary representation. Using the multiple-choice letters, place the letters in the provided boxes with the letter representing the number with the largest number of 1's in the top box.

A. 231_{16} B. 73_8 C. 10111011_2 D. 84_{10}

5.
