American Computer Science League

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1. Prefix-Infix-Postfix

$+ - / * 3\ 6\ 2 / + 3\ 9\ 4\ \wedge 2\ 3$
$= + - / (* 3\ 6)\ 2 / (+ 3\ 9)\ 4\ (\wedge 2\ 3)$
$= + - (/\ 18\ \ 2)\ (/\ 12\ 4)\ 8$
$= +(- 9\ 3)\ 8$
$= (+ 6\ 8)$
$= 14$

1. 14 (D)

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1. **Prefix-Infix-Postfix**

$(A^2 + B) / C + ABC\ = (A \wedge 2 + B) / C + A * B * C$
$= ((A\ 2\ \wedge)+B) / C + (A\ B\ *) * C$
$= (A\ 2\ \wedge B +) / C + (A\ B\ *\ C\ *)$
$= (A\ 2\ \wedge B + C\ /) + (A\ B\ *\ C\ *)$
$= A2\wedge B+C/AB*C*+$

2. A2^B+C/AB*C*+
    (B)

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3. Bit-String Flicking

(01011 OR (NOT 10010) AND 00011)
        = (01011 OR ((NOT 10010) AND 00011))
        = (01011 OR (01101 AND 00011))
        = (01011 OR 00001)
        = 01011

3. 01011 (A)

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4. Bit-String Flicking

(NOT (RSHIFT-2 (LCIRC-2 10011)))
        = (NOT (RSHIFT-2 01110))
        = (NOT 00011)
        = 11100

4. 11100 (E)

5. What Does This Program Do? (Loops)

The first loops counts the numbers from 1 to 50 which have a remainder of 3 when divided by 4. There are 12: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, and 47. The second loop checks even numbers from 1 to 50 to find numbers which are divisible by 6 and not by 4 (6, 18, 30, 42) and those divisible by 7 (14, 28, 42). Therefore, c has a final value of $12 + 4 + 3 = 19$.

5. 19 (C)