**Practice Problems on Arithmetic**

**Problems**

1. Convert the following binary numbers to their decimal

representations:

(a) 11

(b) 1101

(c) 111011

(d) 0101

2. Convert the following hexadecimal numbers to their

decimal representations:

(a) 11

(b) A1

(c) CEF

(d) BA9

3. Convert the following decimal numbers to their

hexadecimal and binary representations:

(a) 11

(b) 4000

(c) 42

(d) 4095

4. Do the binary arithmetic:

(a) 10110 + 01101

(b) 11001 + 00101

(c) 10110 - 01101

(d) 11111 - 01011

5. Do the hexadecimal arithmetic:

(a) 82CD + 1982

(b) E2C + A31

(c) FB28 - 3254

(d) E2C - A31

6. The integers in the following computations are indicated

in hexadecimal, but represent 32-bit two's complement binary numbers.

Perform the operations and indicate if overflow occurs and why. (If

overflow occurs the result is invalid, but show it anyway.)

(a) BBCA270C (b) E3BA265F (c) E9B20F5D

+ AE223464 + E045B9A9 - FE605C8D

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(d) 5FCA5243 (e) 80000000 (f) 6D4AFBC0

- AE223464 + 7FFFFFFF - F89ABCDE

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7. Assume that:

R0 contains 0007F144

R1 contains 00000028

R7 contains EC088840

Here are some expressions which may be D(X,B) addresses. If they

are valid, calculate the values, and if they are not valid, explain

why not:

(a) 56(,1)

(b) 0(0,1,7)

(c) 1(7,0)

(d) 11(1,7)

**Solutions**

1. (a) 3

(b) 13

(c) 59

(d) 5

2. (a) 17

(b) 161

(c) 3311

(d) 2985

3. (a) B (hex) and 1011 (binary)

(b) FA0 (hex) and 1111 1010 0000 (binary)

(c) 2A (hex) and 10 1010 (binary)

(d) FFF (hex) and 1111 1111 1111 (binary)

4. (a) 100011

(b) 11110

(c) 1001

(d) 10100

5. (a) 9C4F

(b) 185D

(c) C8D4

(d) 3FB

6. (a) 69EC5B70 overflow

(b) C3FFE008

(c) EB51B2D0

(d) B1A81DDF overflow

(e) FFFFFFFF

(f) 74B03EE2

7. (a) 00000060

(b) not valid

(c) EC088841

(d) EC088873