Name: _____

Directions: **Work only on this sheet** (on both sides, if needed); do not turn in any supplementary sheets of paper. There is actually plenty of room for your answers, as long as you organize yourself BEFORE starting writing.

**Note: There is an ASCII table on p.37.**

**1.** Suppose our machine has 5-bit word size, with 2s complement storge.

(a) (10) Using 0s and 1s, show the representations of +5 and -5.

(b) (20) What are the largest representable positive number and most negative (i.e. largest in absolute value) negative number?

(c) (20) Suppose **x** and **y** are declared as **int** on this machine. Give an example of positive values of **x** and **y** for which **x+y** is negative.

**2.** (10) Consider the code

```
char c = '+';
```

Give the hex form of the byte at which **c** is stored.

**3.** (20) Consider the code at the top of p.20. If **I** were read in as 22, would any element of **X** be affected? If so, state which one; if not, state why not.

**4.** (20) Consider the code

```
int x;
strncpy(&x,"88",2);
printf("%d\n",x);
```

Say this is run on a 16-bit machine. State what value will be printed out. Your answer must be in the form of a numerical expression, e.g. $3.45 \times 5^{12} - 13$.

**Solutions:**

**1.** 00101, 11011; 15, -16; 8+8 is -16, for example

**2.** 0x2b

**3.** **X[2]**

**4.** '8' has ASCIII code 0x38, so the contents of **x** will be 0x3838, and the value printed out will be $3 \times 16^3 + 8 \times 16^2 + 3 \times 16^1 + 8 \times 16^0$.