Due Date: End of class on Monday, March 28, 2016

Name: .............................................
1. (14 points)

The instructions below are the first 8 instructions in a Pep8 program. Show what the stack looks like after the last instruction has been executed. Show as ?? any location where the contents are unknown.

```
lda 0x1234,i
ldx 0x3579,i
sta 1,s
subsp 4,i
stx 3,s
lda 4,s
asla
sta 1,s
```

2. (20 points)

Write a Pep8 subroutine that is equivalent to the following C function

```
int Q2 (int A)
{
    int local = 0;

    while (A !=0)
    {
        if (A%2 == 1) local++;
        A/=2;
    }
    return local;
}
```
3. (15 points)

Consider the following programming assignment.

Write a Pep/8 assembly language program that reads integers until a negative one is read. Then it reports the sum of the even numbers read and the sum of the odd numbers read. Both totals exclude the negative terminator.

Example input  2 5 4 0 7 4 5 9 -1
Expected output  10 26

A student’s solution to this assignment is shown below. Identify the errors.

```
main:   deci N,d
       lda N,d
       brgt LAB
       deco sum1,d
       charo ' ',i
       deco sum2,d
       stop
LAB:    anda 2,i
       brgt even
odd:    lda sum2,d
       adda N,d
       br main
even:   lda sum1,d
       adda N,d
       br main
N:      .block 2
sum1:   .word 0
sum2:   .word 0
.end
```
4. (30 points)

Write a Pep/8 program that inputs N (N>0) the outputs an N by N square of characters. Rows of the square alternate between * and +. For example, if the input is 6, output is

```
******
++++++
******
++++++
******
++++++
++++++
```
5. (21 points)

Consider the following Pep/8 object code program

C1 00 11 1C 71 00 0F 1E E1 00 11 39 00 11 00 00 1E 00 32 zz

Identify the instructions and, for each one,

(a) Give the opcode in binary
(b) Indicate if the instruction uses a register and, if so, which one
(c) Indicate if the instruction specifies an addressing mode and, if so, which one.