APSC 380 : INTRODUCTION TO MICROCOMPUTERS
1998/99 WINTER SESSION TERM 2

Assignment 1

due January 29 1999 (9:30 AM)

Question 1

What are the values of the following C expressions?

1. `4 * ' '`
2. `32 / 5 + 7`
3. `y = ( 2 + 3 ) == ( 6 - 1 )`
4. `x = 3 == -3 + 6`
5. `9 <= 4 + 9 / 2`
6. `( 0xab & 0xf0 )`
7. `( 0x2e & 0x0f ) | ( 0x2e \& 0xf0 )`
8. `7 * ( 0xe0 && 0x0e )`
9. `( 0x18 ^ 0xff ) + ( 2 << 1 )`
10. `~ ( 256 | '0' )`
11. `4 || ( ' ' == 0x21 )`

Question 2

What will be printed when the following program is run?

```
#include <stdio.h>
main()
{
   int i ;
   i = 0 ;
   while ( i < 7 ) {
      i = i + ( i > 2 && i < 6 ) + 1 ;
      printf ( "%d\n", i ) ;
   }
}
```

Question 3

Write a (complete) C program that prints the numbers between 5 and 75 inclusive that are multiples of 5 except for those numbers that are between 25 and 65 inclusive. Use one (and only one) `for` loop in your program.

Question 4

Write a function with the name `lowerlen` that takes an array of characters as an argument and returns an integer value which is the number of lower-case characters in the array. The last character in the array has a value zero. This character should not be included in the count. For example, given the following sequence of statements, the value of the last expression would be 1:

```
char s[3] ;

s[0]='H' ;
s[1]='i' ;
s[2]=0 ;

len(s) ;
```

Hint: the expression `x>='a' && x<='z'` *is 1 if* `x` *is a lower case character.*

Question 5

Convert the following decimal numbers to binary and hexadecimal. Express the hexadecimal numbers as C constants (use a `'0x'` prefix). Look for similarities between the numbers – it may save you time.

1. 4

2. `3`
3. `32`
4. `31`
5. `128`
6. `127`
7. `235`

Question 6

Convert the following binary numbers to hexadecimal and decimal. The spaces are for ease of reading.

1. `1101`
2. `1001 1101`
3. `0100 0010`
4. `10 1100`
5. `0101 1110`

Question 7

Convert the following hexadecimal numbers to binary and decimal.

1. `0x0a`
2. `0xa`
3. `0xAA`
4. `0xFA`
5. `0x80`
6. `0x08`