Department of Electrical and Computing Engineering

UNIVERSITY OF CONNECTICUT

ECE 3411 Microprocessor Application Lab: Fall 2015

Quiz I

There are 5 short questions in this quiz. There are 7 pages in this quiz booklet. Answer each question according to the instructions given.

You have **45 minutes** to answer the questions.

Some questions are harder than others and some questions earn more points than others—you may want to skim all questions before starting.

If you find a question ambiguous, be sure to write down any assumptions you make.
Be neat and legible. If we can't understand your answer, we can't give you credit!

Write your name in the space below. Write your initials at the bottom of each page.

THIS IS A CLOSED BOOK, CLOSED NOTES QUIZ.
PLEASE TURN YOUR NETWORK DEVICES OFF.

Any form of communication with other students is considered cheating and will merit an F as final grade in the course.

Do not write in the boxes below

1 (x/12)	2 (x/16)	3 (x/24)	4 (x/24)	5 (x/24)	Total (xx/100)

Name:

Student ID:

1. **[12 points]:** Answer the following questions:

   a. Name the loop which executes it's loop body atleast once?

   b. In the code given below, is 'x' a global variable (i.e. it can be accessed anywhere in the program) ?

```
int main(void)
{
 int x;
 ...
 ..
}
```

   c. Does the following code print an "Okay" ?

```
int main(void)
{
 int x = 1;
 if(--x == 0)
 printf("Okay");
}
```

   d. Consider the following code snippet and give the output of test(12) and test(10)

```
double test(int x)
{
 return (x%4==0)?(x/8):((double)x/8);
}
```

Initials:

2. [16 points]: How many times will the statement called `loopBody` be executed in the following construct?

```
int a = 5;
int b= 10;
while (a > 1)
{
   for (int i = 0; i < b/a; i++)
      loopBody;
   a-=2;
}
```

Initials:

3. [24 points]: What is the output of the following code segment?

```
int x = 28, d = 2;
while(x != 0)
{
      if(x % d != 0)
          d = d + 1;
      else
      {
          x = x / d;
          printf("%d\n", d);
          if(x == 1)
              break;
       }
}
```

Initials:

4. [24 points]: Explain the output of the following code snippet.Assume the user gives 14 as the input. In the snippet below,the bitwise operations on integers are performed on their 16 bit representation.

```
int i,j,count = 0;
scanf("%d", &i);
for(j = 0; j < 16; j++)
{
  if((i & (1 << j)) != 0)
    {
       count++;
    }
}
printf("%d\n", count);
```

Initials:

5. [24 points]: Assume initially $PORTC = 0b01011000$, $PORTB = 0b10100001$, $DDRB = 0xA5$ and $PINB = 100$

a. Give the bit representation of PORTC after computing $PORTC \quad \&= \quad \sim (1 << 4)$

b. What is the bit representation of PORTB: $PORTB \quad \hat{} = \quad ((1 << 5) \mid (1 << 1))$

c. What is the output of the register PINB : $PINB \quad |= \quad \sim ((12 >> 2) \& (16 >> 1))$

d. Give the bit representation of DDRB : $DDRB \quad |= \quad (19 >> 2)$

Initials:

End of Quiz

Please double check that you wrote your name on the front of the quiz.

Initials: