Name: **Id#**

COE 301/ICS 233, Term 151

Computer Architecture & Assembly Language

Quiz# 3

Date: Sunday, Oct. 25, 2015

Q1. Write a procedure, **GCD**, that receives two positive numbers in $a0 and $a1 and returns their greatest common divisor in register $v0. It is required that the procedure **preserves the content of all used registers** according to the MIPS programming convention by saving them and restoring them on the stack. The pseudo code of the GCD procedure is given below:

```
int gcd(int m, int n) {
   if ((m % n) == 0)
      return n;
   else
      return gcd(n, m % n);
}
```

Q2.

(i) Given that **Multiplicand=1010** and **Multiplier=1011,** using **signed multiplication**, show the **signed** multiplication of **Multiplicand** by **Multiplier**. The result of the multiplication should be an 8 bit **signed** number in HI and LO registers. Show the steps of your work.

Iteration		**Multiplicand**	**Sign**	**Product = HI,LO**
0	Initialize			
1				
2				
3				
4				

(ii) Given that **Dividend=1011** and **Divisor=0010**, Using **unsigned division**, show the **unsigned** division of **Dividend** by **Divisor**. The result of division should be stored in the Remainder and Quotient registers. Show the steps of your work.

Iteration		**Remainder (HI)**	**Quotient (LO)**	**Divisor**	**Difference**
0	Initialize				
1					
2					
3					
4					