**Questions**

**Question 1:**

**Calculate these timing parameters based on the information provided in the ATmega328 datasheet and in LCDmodule.h and compare with the measured values.**

According to information in LCD header file:

LCD\_Init() function takes 4ms and LCD\_Clear() function takes 4ms in main function,

LCD\_MoveCursor instruction ~40 us to complete, LCD\_WriteString needs ~50 us to display each character in the String.

Printing 3 digits on LCD equals 8ms +190 us ~8.2 ms

Total necessary time is 3\*50 us + 40 us = 190 us.

Total elapsed time is nearly 8.2 ms for the first time the program runs. While executing in ISR ~200 us is discernable and we can measure LCD operation with time markers.

Measured and calculated values are nearly same.

**Question 2:**

**What is the other function call that takes significant time in the ISR? How much CPU time does it take?**

Printbyte takes 7.5 us CPU time and it’s take significant time in ISR.

**Question 3:**

**Suggest some solutions to prevent wasting of CPU time on idle tasks, such as waiting for ADC conversions and LCD operations.**

There is too much operations are doing in ISR and execution takes so much time because of that. Such as LCD and ADC operations are started and completed in that interrupt routine. If we move some executions in main function and reducing ISR execution time we can relieve the interrupt routine and avoid some fails on main program. Flags can helps us for overcome this issue.