**(I)**               Use the table, decode the following instructions. Complete each field.

(a)  0110001100001110

        Operation: LDR

        DR: R1

        BaseR: R4

        offset6: #14

(b) 0001001011000100

        Operation: ADD

        DR: R1

        SR1: R3

        SR2: R4

(c)  0011101000011101

        Operation: ST

        SR: R5

        PCoffset9: #29

(d) 0010010000101001

        Operation: LD

        DR: R2

PCoffset9: #41

(e)  0001101010100011

        Operation: ADD

        DR: R5

        SR1: R2

        Imm5: 3

(f) 1100000011000000

        Operation: JMP

        BaseR: 3

**(II)-** Use the table on the inside back cover of your book (also you can find it at the beginning of this assignment), find Opcode in binary for the following instructions:

NOT: 1001

ADD: 0001

ADD: 0001

RET: 1100

JSR: 0100

JMP: 1100

**(III)-** Use LC-3 simulator write and run a program in an assembly language. Your program

Loads  R1,R2,R3, R4,R5  with numbers 1,2,3,4,5 respectively and save the sum of these registers into R0

Please turn in a doc file (lab2.doc) containing answers to parts I and II. For part III paste your assembly program, your pseudo code, and the value for R2.

**R2 = 2**

**Code Pseudo Code**

**.ORIG x3000 .ORIG is to set the PC at x3000 to run program**

**AND R1, R1, #0 This is to clear registry 1**

**AND R2, R2, #0 This is to clear registry 2**

**AND R3, R3, #0 This is to clear registry 3**

**AND R4, R4, #0 This is to clear registry 4**

**AND R5, R5, #0 This is to clear registry 5**

**ADD R1, R1, #1 Loads the number 1 into registry 1**

**ADD R2, R2, #2 Loads the number 2 into registry 2**

**ADD R3, R3, #3 Loads the number 3 into registry 3**

**ADD R4, R4, #4 Loads the number 4 into registry 4**

**ADD R5, R5, #5 Loads the number 5 into registry 5**

**AND R0, R0, #0 This is to clears registry 0**

**ADD R0, R2, R1 This adds 2 and 1 into registry 0**

**ADD R0, R3, R0 This adds 3 and the previous sum into registry 0**

**ADD R0, R4, R0 This adds 4 and the previous sums into registry 0**

**ADD R0, R5, R0 This adds 5 and the previous sums into registry 0**

**TRAP x21 This is to print out all the sums in registry 0**

**TRAP x25 Halts the program**

**.END Ends the program**