Soln Exercise L7 Assembly

1. List the hexadecimal code for the following program (hand assemble it).

```
Hex
Address  Label  Instruction
 100            Load A
 101            Add One
 102            Jump S1
 103     S2,    Add One
 104             Store A
 105            Halt
 106     S1,    Add A
 107            Jump S2
 108     A,     HEX 0023
 109     One,   HEX 0001
```

Ans.

1108
3109
9106
3109
2108
7000
3108
9103
0023
0001

2. What are the contents of the symbol table for the preceding program?

Ans.

A	108
One	109
S1	106
S2	103

3. Given the instruction set for MARIE in this chapter, decipher the following MARIE machine language instructions. (Write the assembly language equivalent.)

a) 0010000000000111
b) 1001000000001011
c) 0011000000001001

Ans.

a) `Store 007`
b) `Jump 00B`
c) `Add 009`

4. Write the following code segment in MARIE's assembly language:

ifX>1then Y=X+X;
X=0; endif;
Y=Y+1;

Ans.

```
        ORG 100
If,     Load     X       /Load X
        Subt     One     /Subtract 1, store result in AC
        Skipcond 800     /If AC>0 (X>1), skip the next instruction
        Jump     Endif   /Jump to Endif if X is not greater than 1
Then,   Load     X       /Reload X so it can be doubled
        Add      X       /Double X
        Store    Y       /Y= X + X
        Clear            /Move 0 into AC
        Store    X       /Set X to 0
Endif,  Load     Y       /Load Y into AC
        Add      One     /Add 1 to Y
        Store    Y       /Y = Y + 1
        Halt             /Terminate program
X,      Dec      ?       /X has starting value, not given in problem
Y,      Dec      ?       /Y has starting value, not given in problem
One,    Dec      1       /Use as a constant
```