

Assembly-5.

□ For each of the following instructions, give the new destination contents and the new settings of CF, SF, ZF, PF and OF. Suppose that the flags are initially 0 in each part of this question.

1. ADD AX, BX where AX contains 7FFFH and BX contains 0001H.
2. DEC AL where AL contains 00H
3. NEG AL where AL contains 7FH
4. XCHG AX, BX where AX contains 1ABC H and BX contains 712AH

Ans. 1 ADD instruction used ~~is~~ for performing simple addition of binary data in byte.

Now,  $AX = \begin{matrix} & 7 & F & F & F & H \\ & / & / & | & \backslash & \\ 0111 & 1111 & 1111 & 1111 & b. \end{matrix}$  ,  $BX = \begin{matrix} & 0 & 0 & 0 & 1 & H \\ & / & / & \backslash & \backslash & \\ 0000 & 0000 & 0000 & 0001 & b. \end{matrix}$

90,                      0 111 1111 1111 1111  
                            0 000 0000 0000 0000  
                            (4)  
                            1 000 0000 0000 0000

in Area - the sum is 8000 H.

CF = 0, Because there is no carry out.

SF = 1, There is 1 in MSB, so sign flag is 1.

ZF = 0, The result is non-zero,

PF = 1, The low byte of the result has ~~parity~~ Odd parity.

OF = 1. There is carry in but no carry out.

ANS-2 AL = 00H.

Binary conversion of 00H  $\rightarrow$  0000 0000.

The DEC instruction is used for decrementing on operand by 1.

$$\begin{array}{r} \text{So, } 0000 \quad 0000 \\ (-) \quad \quad \quad 1 \\ \hline 1111 \quad 1111 \end{array}$$

in hexa the result is FFH.

CF = NO effect. Increment/Decrement do not effect on CF

SF = 1, There is 1 in MSB.

ZF = 0, The result is non-zero.

PF = 1. The low byte of the result is even parity

OF = 0. Because there is Borrow and Borrow out.

**Ans 3** The 'NEG' instruction negates a value by finding 2's complement of its single operand.

We can say 'NEG' instruction is used for finding 2's complement of operand.

AL = 7FH.

$$\begin{array}{r} \text{1's compl.} \quad 01111111 \quad 1111 \\ (+) \quad 1000 \quad 0000 \\ \hline 1000 \quad 0001 \end{array}$$

in Hexa  $\rightarrow$  81H

CF = 1. Because In Neg the result is non-zero.

SF = 1. There is 1 ~~in MSB~~ in MSB

ZF = 0. The result is non zero.

PF = 1. The low byte has even parity.

OF = 0 Because there is no carry in or out.

Ans-4. XCHG instruction used for exchanging the content of two operand. The rules for operands in the XCHG instruction are the same as those for the MOV instruction.

$AX = 1ABC\ H$

$BX = 712A\ H,$

After exchanging  $AX = 712A\ H$  and  
 $BX = 1ABC\ H.$

In exchanging there is no effect of any other flag.