Ahsanullah University of Science & Technology

Department of Computer Science & Engineering

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Section : B

Question No : 01

Question : 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.

1.1. ADD AX, BX where AX contains 7FFFH and BX contains 0001H

1.2. DEC AL where AL contains 00H

1.3. NEG AL where AL contains 7FH

1.4. XCHG AX, BX where AX contains 1ABCH and BX contains 712AH

Answer :

1.1. AX = 7FFFH = 0111 1111 1111 1111

BX = 0001H = 0000 0000 0000 0001

(+)

1000 0000 0000 0000

In Hexadecimal the sum is 8000H

- CF = 0 Because there is no carry out of the MSB on Addition.
- SF = 1 Because MSB is 1.
- ZF = 0 Because the result is non-zero.
- PF = 1 Because the number of 1 in the low byte is even.
- OF = 1 Because the result of two positive numbers is a negative number.

1.2.

Given, AL = 00H

Now, 01H = 0000 0001

1's complement of 01H = 1111 1110

2's complement of 01H = 1111 1111

AL = 0000 0000

2's complement of 01H = 1111 1111

AL = 1111 1111

In Hexadecimal the result is FFH

- CF = No effect ; Because decrement do not effect CF
- SF = 1 ; Because MSB is 1
- ZF = 0 ; Because the result is non zero
- PF = 1 ; Because the number of 1 in the low byte is even.
- OF = 0 ; Because there is no carry into the MSB and no carry out.

1.3.

Given AL = 7FH

Binary of AL is 0111 1111

1's complement of 7FH = 1000 0000

2's complement of 7FH = 1000 0001

In Hexadecimal it is 81H

- CF = 1 ; Because there is no carry out

- SF = 1 ; Because MSB is 1.

- ZF = 0 ; Because the result is non zero

- PF = 1 ; Because the number of 1 in the low byte is even.

- OF = 0 ; Because there is no carry into the MSB and no carry out.

1.4

AX = 1ABCH = 0001 1010 1011 1100

BX = 712AH = 0111 0001 0010 1010

After execution of XCHG AX, BX :

AX = 712AH = 0111 0001 0010 1010

BX = 1ABCH = 0001 1010 1011 1100

- CF = unchanged
- SF = unchanged
- ZF = unchanged
- PF = unchanged
- OF = unchanged

Because, no status flags are affected in XCHG instruction and all the flags are initially zero.