# lab 8a: **Addition and Subtraction Instructions**

1. Indicate whether or not each of the following instructions is valid. (notate: V = valid, I = invalid) Assume that all operations are unsigned.

**a. add ax,bx; V**

**b. add dx,bl; V**

**c. add ecx,dx; V**

**d. sub si,di; V**

**e. add bx,90000 I**

**f. sub ds,1; V**

**g. dec ip; I**

**h. dec edx; V**

**i. add edx,1000h; V**

**j. sub ah,126h; V**

**k. sub al,256; I**

**l. inc ax,1; I**

2. What will be the value of the Carry flag after each of the following instruction sequences has executed?

(notate: CY = carry, NC = no carry)

**a. mov ax,0FFFFh**

**add ax,1**

**CF = CY**

**b. mov bh,2**

**sub bh,2**

**CF = NC**

**c. mov dx,0**

**dec dx**

**CF = NC**

**d. mov al,0DFh**

**add al,32h**

**CF = CY**

**e. mov si,0B9F6h**

**sub si,9874h**

**CF = NC**

**f. mov cx,695Fh**

**sub cx,A218h**

**CF = CY**

3. What will be the value of the Zero flag after each of the following instruction sequences has executed?

(notate: ZR = zero, NZ = not zero)

**a. mov ax,0FFFFh**

**add ax,1**

**ZF = ZR**

**b. mov bh,2**

**sub bh,2**

**ZF = ZR**

**c. mov dx,0**

**dec dx**

**ZF = NZ**

**d. mov al,0DFh**

**add al,32h**

**ZF = NZ**

**e. mov si,0B9F6**

**sub si,9874h**

**ZF = NZ**

**f. mov cx,695F**

**add cx,96A1h**

**ZF = ZR**

4. What will be the value of the Sign flag after each of the following instruction sequences has executed?

(notate: PL = positive, NG = negative)

**a. mov ax,0FFFFh**

**sub ax,1**

**SF = PL**

**b. mov bh,2**

**sub bh,3**

**SF = NG**

**c. mov dx,0**

**dec dx**

**SF = NG**

**d. mov ax,7FFEh**

**add ax,22h**

**SF = NG**

**e. mov si,0B9F6h**

**sub si,9874h**

**SF = PL**

**f. mov cx,8000h**

**add cx,A69Fh**

**SF = PL**

5. What will be the values of the Carry, Sign, and Zero flags after the following instructions have executed?

(notate: CY/NC, PL/NG, ZR/NZ)

**mov ax,620h**

**sub ah,0F6h**

**CF = CY**

**SF = NG**

**ZF = NZ**

6. What will be the values of the Carry, Sign, and Zero flags after the following instructions have executed?

(notate: CY/NC, PL/NG, ZR/NZ)

**mov ax,720h**

**sub ax,0E6h**

**CF = NC**

**SF = PL**

**ZF = NZ**

7. What will be the values of the Carry, Sign, and Zero flags after the following instructions have executed?

(notate: CY/NC, PL/NG, ZR/NZ)

**mov ax,0B6D4h**

**add al,0B3h**

**CF = CY**

**SF = NG**

**ZF = NZ**

8. What will be the values of the Overflow, Sign, and Zero flags after the following instructions have executed?

(notate: OV/NV, PL/NG, ZR/NZ)

**mov bl,- 127**

**dec bl**

**OF = OV**

**SF = NG**

**ZF = NZ**

9. What will be the values of the Carry, Overflow, Sign, and Zero flags after the following instructions have executed?

(notate: CY/NC, OV/NV, PL/NG, ZR/NZ)

**mov cx,- 4097**

**add cx,1001h**

**CF = NC**

**OF = NV**

**SF = NG**

**ZF = NZ**

10. What will be the values of the Carry, Overflow, Sign, and Zero flags after the following instructions have executed?

(notate: CY/NC, OV/NV, PL/NG, ZR/NZ)

**mov ah,- 56**

**add ah,- 60**

**CF = NC**

**OF = NV**

**SF = NG**

**ZF = NZ**