

Sample CSCI 51A Mid Term #1

John Zenor

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Note: Give all answers in **HEX**. Assume that one instruction follows immediately after the preceding one, as if these instructions were running as part of a real assembly language program running on a real Intel 8086 computer system. If the answer cannot be given in HEX because the contents of a memory location are not known, give the answer in English, for example: "Contents of memory location 1234h." There are no intentional lines of illegal assembly language. **assume decimal** is the default number base.
No partial credit—each answer is either correct or incorrect!!!

```
; The following lines are part of the data segment
; portion of the assembly language program
A      DB      1,2,3,5,-1,0FFH
B      DW      12          ;NOTE: decimal 12
C      DW      2,4,5
D      DB      1,3,7
E      DB      6 DUP(3)
F      DW      0FFFAH

; The following lines are part of the code segment
; portion of the assembly language program.
;
STARTHERE MOV      AX,B          ;AX=_____ [1A]

; XOR clears the indicated register to zero.
      XOR      AX,AX          ;AX=_____ [1B]
      MOV      AL,E+2          ;AX=_____ [1C]
      MOV      AL,A+4          ;AX=_____ [1D]
      MOV      AX,0FFFFH      ;AX=_____ [1E]
      MOV      BX,OFFSET A     ;BX=_____ [1F]
      MOV      AX,2[BX]        ;AX=_____ [1G]
      MOV      AX,BX+2         ;AX=_____ [1H]

; INC adds one to the indicated register
      INC      BX              ;BX=_____ [1I]
      MOV      AX,2[BX]        ;AX=_____ [1J]
      MOV      BX,3            ;AX=_____ [1K]
      MOV      AX,C[BX]        ;AX_____ [1L]
```

```

MOV      AX,WORD PTR D;AX=_____ [1M]
MOV      AX,C+5      ;AX=_____ [1N]
MOV      AX,3456H    ;AX=_____ [1P]
MOV      AL,0AH      ;AX=_____ [1Q]
MOV      AX,DS:[3]   ;AX=_____ [1R]
; ADD AX,B will add the contents of B to AX and leave
; the answer in AX
MOV      AX,F        ;AX=_____ [1S]
ADD      AX,C        ;AX=_____ [1T]
; ZF=_____ CF=_____ OF=_____ SF=_____ [1U]
JLE      SOMEWHERE;Would it jump? yes no[1V]

```

2. What is 0AB9357E (hex) in binary?

3. What is 011110100111000101010 (binary) in hex?

4. Perform the hex addition, and fill in the blanks for the flag bits that result. Assume that the addition is performed on an Intel 8086 family machine in 16 bits.

```

  F  F  F  C
+ _____ 3

```

ZF=_____ CF=_____ OF=_____

SF=_____

5. Perform the hex addition, and fill in the blanks for the flag bits that result. Assume that the addition is performed on an Intel 8086 family machine in 16 bits.

```

  8  0  0  0
+  F  F  F  F

```

ZF=_____ CF=_____ OF=_____

SF=_____

6. Fill in the blanks with the correct decimal constant so that the loop bodies will be executed exactly 20 times. Also, fill in the values of the flag bits at the end of each loop.

6A)

```

                MOV     DX, _____
LP              CMP     DX, 0
                JEQ     LPEXIT
; THE CODE FOR THE LOOP BODY IS HERE
                -----
                -----
                DEC     DX
                JMP     LP

                LPEXIT ; THE REST OF THE PROGRAM FOLLOWS
; At LPEXIT:  ZF=____ CF=____ OF=____ SF=____ NOTE THIS
LINE!!!!!!!
```

6B)

```

                MOV     DX, _____
LP              -----
; THE CODE FOR THE LOOP BODY IS HERE
                -----
                -----
                DEC     DX
                JGE     LP

                LPEXIT ; THE REST OF THE PROGRAM FOLLOWS
;                ZF=____ CF=____ OF=____ SF=____ NOTE THIS
LINE!!!!!!!
```

6C) For this question, fill in the correct jump instruction to execute the loop body exactly 20 times.

```
                CLR      DX
LP      -----
; THE CODE FOR THE LOOP BODY IS HERE
-----
-----
                INC      DX
                CMP      DX, 20
                _____ LP
LPEXIT ; THE REST OF THE PROGRAM FOLLOWS
;          ZF=_____ CF=_____ OF=_____ SF=_____ NOTE THIS
LINE!!!!!!!
```

7. If CS = 1000H and DS = 2000H, what actual memory address will be referenced by the following MOV instruction:

```
MOV      AX, OFFSET 14H
```

8. Assume the data segment of a program is called DSEG, and the code segment of a program is called CSEG. Show the ASSUME statement that would be used and also show the instructions that would load the correct value into DS.

8B. Why do we need to include the instructions in every program that load DS with the beginning of the Data segment?

8C. What would happen to the program execution if we forgot these instructions?