

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING  
UNIVERSITY OF COLORADO—BOULDER

ECEN2120

Exam #1

FALL1998

Closed book, closed notes. This is a multiple-choice examination, and will be machine graded. Fill out your answer sheets carefully, using a number 2 pencil. Be certain to erase any incorrect marks completely. **BE SURE TO ENTER YOUR STUDENT NUMBER AND LAST AND FIRST NAME.** Do not make spurious marks on your answer sheet. Answer all questions, incorrect answers do not count against correct answers. N. A. means “none of the above.”

1. Assume that the value 69H is in location X of an 8086 system, and the value A1H is in location Y. The following fragment is executed:

```
MOV AL, X
SUB AL, Y
```

The value in AL after execution is:

- a. C8H      b. C7      c. 38      d.37      e. N.A.

2. The fraction 4.125 is expressed as an unsigned 8-bit hexadecimal number as:

- a. 1EH      b. DEH      c.42H      d.21H      e.N.A.

3. Which of the following code sequence emulates, or imitates, the behavior of the 8086 intrasegment CALL and RET instructions on the 8086? (... indicates missing lines.)

<p>a.    PUSH      CS       PUSH      IP       ...       POP        IP       POP        CS</p>	<p>b    PUSH      IP       ...       POP      IP</p>
<p>c.    PUSH      CS       PUSH      IP       PUSHF       ...       POP        IP       POP        CS</p>	<p>d    PUSH      CS       PUSH      IP       ...       POP        CS</p>

e. N.A.

4. The decimal number -9 is represented in the IEEE 32-bit floating point format as the following hexadecimal number:

- a. C1300000      b. 41200000      c. C1100000      d. B1200000      e. N.A.

Answer the following five questions on the basis of the following excerpt of an 8086 program. (... indicates missing lines. Assume that values in the DATA segment were not changed prior to entry into the code shown.)

```

                                DATA      SEGMENT  PUBLIC
                                DB          3 DUP ?
                                COUNT      DW          2
                                DATA      ENDS
                                CODE      SEGMENT  PUBLIC
                                ...
0007      INIT:      MOV      CX, COUNT
000B                                XOR      AX, AX
000D                                JMP      SEQ
0010      BAK:      MOV      AX, CX
0012                                JMP      FOR
0015      SEQ:      DEC      DX
0016                                DEC      CX
0017                                BNZ      BAK
                                ...
002D      FOR:      MOV      DX, AX
002F                                JMP      INIT

```

5. The content of the byte at offset 000E in the code segment can be expressed in hexadecimal as:
  - a. 05
  - b. 06
  - c. 07
  - d. 15
  - e. FB
  
6. The content of the byte at offset 0018H in the code segment can be expressed in hexadecimal as:
  - a. F9
  - b. F0
  - c. F7
  - d. 09
  - e. 10
  
7. The number of bytes occupied by the instruction at offset 0007 in the code segment is:
  - a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. 5
  
8. A plausible value for COUNT in the assembler's symbol table is
  - a. 1.
  - b. 2
  - c. 3
  - d. 4.
  - e. Cannot determine from the information given.
  
9. The offset of COUNT in the DATA segment at load time is:
  - a. 1
  - b. 2
  - c. 3
  - d. 4
  - e. Cannot determine from the information given.

Answer the next three questions on the basis of the following fragment of an Intel 8086 program:

```
DATA      SEGMENT
A         DW      ?
B         DB      FFH
C         DW      1234H
D         DB      EEH
DATA      ENDS
CODE      SEGMENT PUBLIC
...
MOV      AX, OFFSET C
MOV      DL, B
MOV      DH, D
MOV      A, DX
```

Assume that no instructions affecting the contents of memory locations A, B, or C have been executed prior to execution of the instructions given.

10. The contents of AX after execution of the given instruction sequence can be represented in hexadecimal as:

- a. 0002H      b. 0003H      c. FFFFH      d. 1234H      e. 0004H

11. The content of DL after execution of the given instruction sequence can be represented in hexadecimal as

- a. 00      b. 01      c. FE      d. FF      e. N. A.

12. The content of location A after execution of the given instruction sequence can be represented in hexadecimal as

- a. FFEE      b. 00FF      c. FF00      d. EEFF      e. N. A.