

COE 538 Quiz

Name: _____ Student #: _____ Time: 50 min.

Notes:

1. Close book
2. Write the answers in the space provided
3. Show the process that is used to derive your answers

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1. Write two assembler directives to initialize memory at locations \$6000 and \$6001 to \$1025.
[1 mark]

ORG \$6000
FDB \$1025

2. Given bit N of the Condition Code Register (CCR) is set to 1, bit V is set to 1, and the Program Counter (PC) is set to \$6000. Calculate the value stored in PC after the following instruction is executed:

bge \$20 [2 marks]

PC = \$6020

3. Given the value stored in Accumulator A is \$18 and the value stored in Accumulator B is %01001100, calculate the value stored in Accumulator D. Write down the value using decimal representation.
[2 marks]

0001 1000 0100 1100₂ = 6220₁₀

4. Write one instruction to accomplish each of the following tasks: [4 marks]
a) Add the content of Accumulator B to Accumulator A.

ABA

- b) Branch to memory location [PC] + \$60.

BRA \$60

- c) Set the most significant three bits of Accumulator B to 1.

ORAB #%1110 0000

- d) Clear the least significant two bits of Accumulator A to 0.

ANDA #%111 1100

5. Given the program listing below, trace the results for each instruction from *start* to *end*. Use the table provided below to indicate the values stored in register A, B, D, X, and memory location \$6050 and \$6051 after the execution of each instruction. Show all numbers using hexadecimal representation. [6 marks]

| | | | |
|--------------|------|------------------------|--------------------------------|
| | org | \$6000 | |
| values | fcb | \$23, \$D1, \$A2, \$3F | |
| | org | \$6050 | |
| result | fcb | \$00, \$00 | |
| | org | \$6100 | |
| <i>start</i> | clra | | a=0 |
| | clrb | | b=0 |
| | ldx | #values | x=\$6000 |
| | ldd | values | d=\$23D1 |
| | addb | 1,x | b=A2, c=1 |
| | adca | 2,x | a=C6=1100 0110 |
| | asra | | a=1110 0011=E3 |
| | std | result | [6050]=\$E3 [6051]=\$A2 |
| <i>end</i> | swi | | |

| Instructions | A | B | D | X | [\$6050] | [\$6051] |
|--------------|----|----|------|------|----------|----------|
| ldx #values | 00 | 00 | 00 | 6000 | 00 | 00 |
| ldd values | 23 | D1 | 23D1 | 6000 | 00 | 00 |
| addb 1,x | 23 | A2 | 23A2 | 6000 | 00 | 00 |
| adca 2,x | C6 | A2 | C6A2 | 6000 | 00 | 00 |
| asra | E3 | A2 | E3A2 | 6000 | 00 | 00 |
| std result | E3 | A2 | E3A2 | 6000 | E3 | A2 |

6. Write an instruction sequence to find the sum of the first N numbers in the following number sequence: 2, 4, 6, 8, 10... [10 marks]

```
m1    CLRA
      CLRB
      ADDA #2
      INCB
      CMPB #N
      BNE m1
      SWI
```