COE 538 Quiz

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

Notes:

1. Close book
2. **Neatly** write the answers in the space provided
3. The Instruction Set can be detached

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1. Write assembler directives to reserve 100 bytes from $6000. [1 mark]

```
        ORG   $6000
        RMB   100
```

2. Assume that the E-clock signal frequency is 1 MHz. Write a program to create a time delay of 100 µS. [3 marks]

```
        LDY   #14
del     DEY
        BNE   del
```

3. Given a program listing below, trace the results for each instruction from *start* to *end.* What are the contents of the memory locations at $6010 and $6011 after the execution of the *swi* instruction? [6 marks]

   Note: *ASCII* codes for characters *t, =,* and *@,* are *$74, $3D,* and *$40* respectively.

```
        org     $6000
temp    fcc     't=@'

        org     $6010
res     fdb     $4, $20

        org     $6050
start   ldx     #temp       ;x = $6000
        ldaa    2, x        ;a = $40
        ldy     #res        ;y = $6010
        ldab    1, y        ;b = $04
end     mul                 ;d = $0101
loop    deca
        bne     loop
        std     res         [$6010] = 00        [$6011] = 00
        swi
```

4. Write a program (only one program):

   - to multiply the contents of the memory location at $6000 by the contents of the memory location at $6001 [2 marks]
   - to add the contents of the memory location at $6050 to the product computed above and save the result at $7000 and $7001 [3 marks]

```
LDAA  $6000
LDAB  $6001
MUL

ADDD  $6050
STD   $7000
```

5. Write a code that sets two most significant bits and clears two least significant bits of Accumulator A. [2 marks]

```
ORAA  #% 1100 0000
ANDA  #% 1111 1100
```

6. Assume that the result of the A-to-D conversion of a DC voltage V_x at the channel 0 of the ADC is $57. What is the value of the voltage V_x in Volts, if V_{REFL}=0 V and V_{REFH}=5 V? [2 marks]

$57 = 87

$255 / 87 = 5 / V_x$

$V_x = 5x87 / 255 = 1.71$ [V]