# Quiz 4

# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Time limit is 60 minutes.
* Write only answers in the answer blanks provided. Use only designated areas or backs of pages for scratch work.

1. *50 points*. Generate a stack diagram as done in class (show values in memory used for the stack and the SP register) ***for each line that affects the stack items***, and label each diagram with the corresponding ***line number***. Leave unneeded diagrams blank.

ORG $C000

1: LDS #$3600 ; C000

2: LDAA #$11 ; C003

3: LDAB #$22 ; C005

4: JSR SUBRA ; C007

5: HERE BRA HERE ; C00A

6: SUBRB LEAS -1,SP ; C00C

7: PSHB ; C00E

8: PULD ; C00F

9: RTS ; C010

10: SUBRA PSHA ; C011

11: JSR SUBRB ; C012

12: PULB ; C015

13: RTS ; C016

After

35FC

35FD

35FE

35FF

After **1**

**3600**

SP

After

After

After

After

After

35FB

35FA

35F9

After

After

35FC

35FD

35FE

35FF

35FB

35FA

35F9

SP

After

After

After

After

After

1. *50 points*. Write an assembly subroutine for subtracting a 2-byte number *Num2* from another two byte number *Num1* and returning the 2-byte result *Result*. The memory declarations for the numbers and the result are given below. Also write the portion of a main program that calls the subroutine using the given parameters and draw the stack frame. Do not use memory other than the stack for any temporary data you may have.

The subroutine parameters are to be passed as follows:

Num1 passed by value in stack

Num2 passed by reference in stack

Result returned by value in D

Caller preserves nothing

Callee preserves nothing

ORG $3000

Num1 DC.W $AABB

Num2 DC.W $9988

Result DS.W 2

* 1. Write the assembly code for initializing the stack pointer to $3600 and then calling the MySub subroutine by using the correct parameter passing technique.

main:

c. Draw the stack diagram below

* 1. Write assembly code for the subroutine:

MySub: