ECE5362 Midterm 1
Sp 2017

Name_____

1. Mark (give) the correct answers for the following multiple choice questions (10 points).

   a. In the computer, the ALU can do subtraction as well as addition by changing the electronic circuits from Addition to Subtraction in the ALU ( ), changing the representation of the subtrahend and then do the addition ( ), changing the representation of the minuend and then do the addition ( ).

   b. Register AC ( ), IR ( ), X ( ), and MDR of the Simple Computer are transparent to the programmer (mark all that apply).

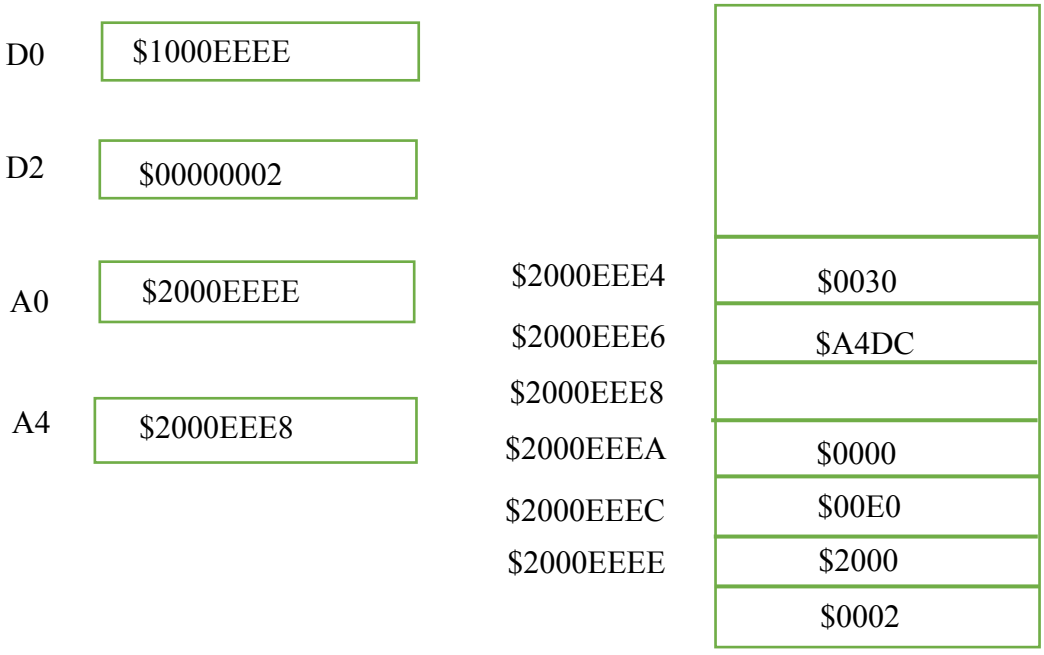
   c. When you push data to the stack, the content of SP should always be subtracted ( ) , added to ( ) by 4 ( ), 2 ( ), 1 ( ) or one of the three numbers ( ).

   d. Is arithmetic and logic operation ( ) or data transfer between registers ( ) more frequent operation performed by a CPU?

   e. A programmer of a computer can see the following registers in OSIAC3562 (mark all which applies):

      AC ( ), X ( ), Q ( ), PC ( ), T1 ( ) and SP ( ).

2. Consider the following *initial state* of the Example Machine (20 points).



Answer the following two questions:

A. What will be the effect of executing each of the following instructions, starting each time from the *initial state.* You should specify the contents of the registers and memory locations affected by the instruction.

B. Answer how many words are needed to store each instruction and many memory accesses are need to executing <u>each</u> instruction.

		No. of Words	No. of Accesses
MOVE.L	D2, (A4)		
MOVE.L	-(A4), D0		
ADD.L	(A0)+, D0		
MOVE.L	#$2000EEEE, D2		
MOVE.L	$2000EEEE, D2		
MOVE.L	D2, $2000EEEE		

3. Answer the following two questions (10 points).

A. Is the following instruction in the Example Machine legal? Explain why (based the addressing modes) – (6 points)

ADD (A1)+, (A2)

B. For two 8-bit operands, will the following additions produce an overflow? (4 points)

126 and 2

-126 and -2

126 and -2

-126 and 2

Sign the pledge: No aid given or received.

Signature: _____