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ECE 242

Exercise #5

Solve the following exercises. You must SHOW YOUR WORK.

1. If (A1) = $1000, the location addressed by CLR.B $FFFE(A1) is **$10FFE**.
   This instruction clears the last byte of the content at $FFFE (A1), after execution of the instruction, the operand address is $10FFE.

2. If (A1) = $1000, determine the operand address for the following instructions:
   a. CLR.B $FFFF(A1)
      This instruction clears the last byte of the content at $FFFF (A1), after execution of the instruction, the operand address is **$10FFF**.
   b. MOVE.B (A1) +, D1
      This instruction moves a byte from A1 at $1000 into the data register D1. After moving, the address A1 is incremented by 1, the operand address is **$1000**.
   c. MOVE.W -(A1), D1
      The address of A1 is decremented by 2. This instruction moves the new value of A1 at the address into D1. The operand address is **$0FFE**.

3. If the instruction CMP.W I, J has been executed, specify the instruction that will perform the following:
   a. Branch to ZERO if I = J
      The statement is equivalent to BEQ ZERO
   b. Branch to LESS if I < J
      The statement is equivalent to BL LESS
   c. Branch to MORE if I > J, where ZERO, LESS and MORE are labels.
      The statement is equivalent to BG MORE
      CMP.W I, J
      BEQ ZERO
      BLT LESS
      BGT MORE

4. If the instruction BSR SUB1 is located at address $3012 and the label SUB1 is at $3022, the machine language instruction for BSR SUB1, **$6110 or 0110 0001 0001 0000**.

5. Define the machine code for these instructions. Include both operation and operands.
   a. MOVE.B $12000, $3FFF

	Size	Register (Destination)	Mode (Destination)	Mode (Source)	Register (Source)
00	01	000	111	111	001

The destination as a word and the source as a long word. The full instruction is:
0001 0001 1111 1001 0011 1111 1111 1111 0000 0000 0000 0001 0010 0000 0000 0000
$11F93FFF00012000

b. ADD.W #5, D1

Instruction	Register	Opmode	Addressing mode	Effective Address Register	Data
1101	001	001	111	100	0000 0000 0000 0101

$D27C0005

c. MOVE.L D2, D5

	Size	Register (Source)	Mode (Destination)	Mode (Destination)	Register (Source)
00	10	010	000	000	010

$2A02