**EECE 237** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Assembly code exercise**

Section # \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Write all values in hexadecimal. Use the memory chart shown at the next page. Each question is contained by itself, and is not affected by a previous question.

1. After the instruction LDR R4, [R8, R1]
   * + - 1. What is the content of R4? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. After the instruction STR R6, [R10]
   * + - 1. What memory location is modified? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. After the following two instructions,

LDR R2, =0x2000101C

STR R6, [R2]

What address is affected by these codes? a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the content of the affected address? b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. After the instruction MVN R3, R4
   * + - 1. What is the content of R3? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. After the instruction ADC R0, R5, #10
   * + - 1. What is the content of R0? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. After the instruction AND R11, R7, #0x0000FFFF
   * + - 1. What is the content of R11? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. After the instruction ORR R11, R7, #0x0000FFFF

a. What is the content of R11? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The results from each question are self-contained and do not carry over to any other questions.**

**(assume leading zeroes if not specified – 0x02 = 0x0000 0002)**

|  |  |  |  |
| --- | --- | --- | --- |
| R0 = 0x02 | R3 =0x10 | R6 = 0xFFFF FF00 | R9 = 0x2000 1020 |
| R1 = 0x04 | R4 = 0x06 | R7 = 0x2000 1008 | R10 = 0x2000 0FF0 |
| R2 = 0x07 | R5 = 0x20 | R8 = 0x2000 100C | R11 = 0x2000 1000 |
| SP = 0x2000 0470 | | Flags: N=0 Z=1 C=1 V=0 | |

Registers:

Stack is DESCENDING, FULL.

Memory:

(assume this is a valid RAM region)

|  |  |
| --- | --- |
| Address | Data |
| 0x2000 0FF0 | 0x0000 AAAA |
| 0x2000 0FF4 | 0x0000 0102 |
| 0x2000 0FF8 | 0x0000 2000 |
| 0x2000 0FFC | 0x0000 0010 |
| 0x2000 1000 | 0x0000 0020 |
| 0x2000 1004 | 0x0000 0030 |
| 0x2000 1008 | 0x0000 0800 |
| 0x2000 100C | 0x0000 0400 |
| 0x2000 1010 | 0x0000 0001 |
| 0x2000 1014 | 0x0011 0000 |
| 0x2000 1018 | 0x0200 0FFF |
| 0x2000 101C | 0x0000 0000 |
| 0x2000 1020 | 0x0002 0010 |
|  |  |