

EE 308

Exam 1 – Second Try

February 26, 2001

Name: _____

1. Below are some data in the HC12 memory:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0900	D6	05	35	CF	E0	00	FE	08	20	A6	00	47	6A	05	08	53
0910	26	F7	34	C6	C8	CD	9C	40	03	26	FD	53	26	F7	3D	3F
0920	07	C2	3A	68	F3	09	C2	67	9A	0F	AA	55	08	40	CD	CF

Indicate the values in the registers after the HC12 executes the following instructions. Also write down the number of cycles needed to execute each instruction. Show what will be in the registers (in hex) after each of the instructions. If the instruction does not change a register, you may leave that entry blank.

Instruction	D		X	Y	SP	N	Z	V	C	Addressing Mode	Effective Address	Number Cycles
	A	B										
	AA	25	A217	5412	0920	1	0	1	0			
ldx #0920												
ror \$090B												
staa \$01												
bitb \$0913												
pula												
orab 2,x-												

2. Write assembly-language instructions to do the following. Be sure to define the address of any register or port you access.
- Make all bits of Port B output. Read an 8-bit signed integer from address 0x0920. If the number is larger than 0x50, write an 0xff to Port B. If the number is equal to or smaller than 0x50, write an 0x00 to Port B. Then return to DDebug12 with the swi instruction.

3. Consider the following code fragment:

```
org    $0800
lds    #0A00
clr    $01
coma
dec    $091b
stab   2,-x
swi
```

- (a) Hand assemble this program. That is, show what will be in the HC12's memory after the program is assembled and loaded. Fill in only those memory locations which can be determined from the above code fragment.

Address	Byte

- (b) Using the same program fragment above, determine how many cycles it will take to execute each instruction.

	Cycles	Addressing Mode
lds #0a00		
clr \$01		
coma		
dec \$091b		
stab 2,-x		
swi		

- (c) How long will it take (in seconds) to execute the six instructions above?