CS-280 Quiz 3 Solution
Taken Friday 28 March 2002; Returned Monday 31 March 2003

Show the contents of the A, B, and IX registers and the C (carry) bit of the CCR after each of the instructions at the bottom of the page. The following 4 instructions have been used to initialize these registers and the C bit…

```
ldaa    #0x2C       ; put the value 0x2C into accumulator A
ldab    #0x12       ; put the value 0x12  into accumulator B
ldx     #0x0102     ; put the value 0x0102 into index register X
sec                 ; set the carry bit
```

You may use the reference guide. You may use any base that is convenient.

You may indicate an unchanged register with a ditto mark (") or just copy its contents onto the next line.

You will not be penalized for propagated errors. (For example, if you make a mistake on the first line, you can still get full credit for the other lines, as long as you correctly move forward from your line 1 results.

	D				Memory	
	A	**B**	**IX**	**C bit**	**Address**	**Content**
	0x2C = 0b00101100	0x12 = 0b00010010	0x0102	1	0x0100	0x51
sbca 1,x	0x19	"	"	0	0x0101	0x10
tab	"	0x19	"	"	0x0102	0x6C
ldaa 0,x	0x6C	"	"	"	0x0103	0x12
xgdx	0x01	0x02	0x6C19	"	0x0104	0x33
aba	0x03	"	"	0	0x0105	0x00

sbca 1,x ; IX = 0x0102. So 1,x refers to 0x0103 in memory, which contains 0x12.
Subtract with carry from a… a = a – memory – carry = 0x2C – 0x12 – 1 = 0x1A – 1 = 0x19.
The subtraction did not result in a borrow, so the C bit becomes 0.
tab ; Transfer a to b.
ldaa 0,x ; IX = 0x0102. So 0,x refers to 0x0102 in memory, which contains 0x6C.
xgdx ; Exchange D (A:B) with IX. D = A:B = 0x6C19. Old IX value of 0x0102 is split into two bytes.
The most significant byte goes to A; the least significant goes to B.
aba ; Add b to a ; a += b; There is no carry out, so the C bit goes to 0 (but it was already 0).