

EE 354
Hour Exam 1

Name _____
 September 13, 2017

1. What is in the accumulator after each of the following?

```
mov P1, #77h
mov a, P1
xrl a, #0AAh;
```

A = _____

```
mov a, #33h
mov r1, #8Fh
add a, r1
adc a, r1
```

A = _____

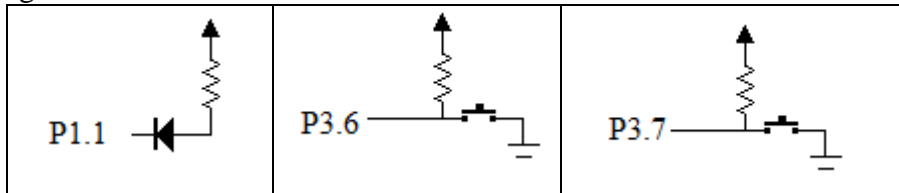
```
mov a, #0CCh
addc a, #33h
rlc a
```

A = _____

2. Suppose the accumulator had some unknown data in it. If you execute the following sequence is it possible to determine what is in the accumulator when the sequence is done. If so, what is in the accumulator? If not, why not?

```
mov r1, a
xrl a, r1
```

3. Switches are connected to P3.6 and P3.7 as shown. There is one LED connected to P1.1. If we run the program below how should the switches be set in order to turn the LED on.



```
Start: mov c, P3.7
      orl c, P3.6
      jc ON
      setb P1.1
      sjmp Start
ON:   clr P1.1
      sjmp Start
end
```

4. At what address the the AT89C51CC03 begin execution of code after a reset?

5. Many of the programs we wrote in class have these two lines near the top:

```
MainSeg SEGMENT CODE
...
RSEG MainSeg
What do these lines do?
```

6. Show what is in registers R0 to R3, the accumulator, and internal memory locations 7 to 0C when the program below completes. Assume register bank 0. Use X for indeterminable.

```

mov sp, #8
mov r1, #2
push 1
mov r2, #1
inc r2
mov r3, #11h
inc r3
pop acc
push 3
push 2
push 1
pop 2
pop acc
pop 1

```

Registers	A	
	R0	
	R1	
	R2	
	R3	
Data memory	7	
	8	
	9	
	0A	
	0B	
	0C	

7. The 8051 has no shift instructions. Instead it uses a rotate instruction which can be either an 8-bit rotate or a 9-bit rotate (with the carry). Write a MACRO called ShiftL which will shift a register the left one place and bring in a zero from the right. For example, if R0 has the number 0A5h = 10100101 in it and I do a ShiftL R0, your macro should shift R0 to the left one place such that it becomes 04Ah = 01001010.

8. In the following sequence how many times is P1.0 set to 1? Show your work.

```

clr P1.0
mov r1, #0
LP1: mov r2, #20
LP2:  mov r3, #10
LP3:  setb P1.0
      clr P1.0
      djnz r3, LP3
      dec r2
      mov a, r2
      jnz LP2
inc r1
cjne r1, #30, LP1

```

9. Write an assembly language program to do a 16-bit left shift of the number in R2 and R3 where R2 has the least significant byte. Note that this processor has no shift instructions – only an 8-bit rotate. You can accomplish a shift by preloading the carry with zero and using RLC to rotate register 2. The MSB from R2 will rotate into the carry. You can then do a RLC on R3 and the MSB from R2 will become the LSB of R3.