

1. Write a logical instruction sequence which does the same thing as the following bit instructions:

```
clr c  
mov P1.5, c
```

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

A)

```
setb c  
mov a, 81h  
orl c, ACC.7  
mov a, #0  
rlc a
```

A = _____

B)

```
mov a, #36h  
Top: rrc a  
jnc Top
```

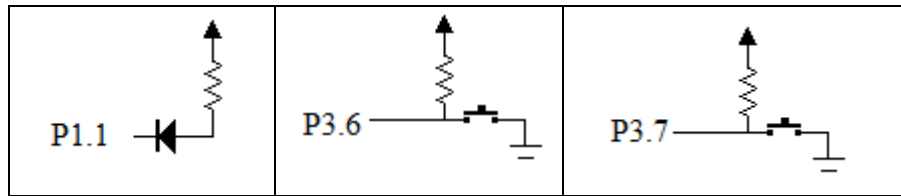
A = _____

C)

```
mov a, #22h  
mov 5, a  
inc 5  
add a, R5
```

A = _____

3. Switches are connected to P3.6 and P3.7 as shown. There is one LED connected to P1.1. Write an 8051 assembly language program to turn the LED on only if both switches are pushed. Your program should run forever.



4. Give at least two ways in which a MACRO is different from a subroutine in assembly language on the 8051.

5. Calculate the execution time of the following sequence. Assume that the crystal is at 10 MHz.

```
    mov r1, #32
LP:  dec r1
     dec r1
     mov a, r1
     jnz LP
```

6. What does the instruction `push ps` do?

7. If memory location 15 has 0F0H and memory location 16 has 081H what is in these two locations *after* the following sequence runs.

```
clr c
mov a, 15
rlc a
mov 15, a
mov a, 16
rlc a
mov 16, a
```

8. Write a sequence of push and pop instructions (only) which will place the data in R1 into R3, R3 into R2, and R2 into R1 without losing any information.

9. Write an assembly language program to copy the odd bits (bits 1, 3, 5, and 7) of P1 to the even bits (bits 0, 2, 4, and 6) of register 3. Do not alter any other bits in R3.