# Lab-6
# Serialization of data and BCD and ASCII conversion in PIC

**Objective:**

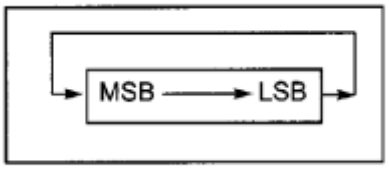
In this lab students will learn

- How to implement of serialization of data in PIC using rotate instructions.
- How to perform conversion between BCD and ASCII?

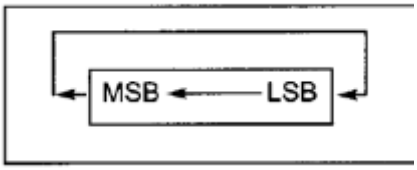
**Theory**

There are four types of rotate instructions in PIC microcontroller that are: RRCF, RRNCF, RLCF, RLNCF. This will allow the contents of file registers to rotate right or left. Two types of rotations are possible: first is without carry and the second is through carry flag of status register. Each of these instructions is shown below:

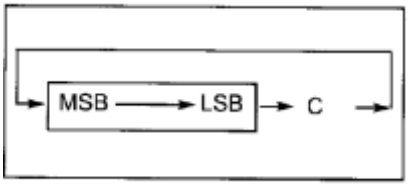
**RRNCF**



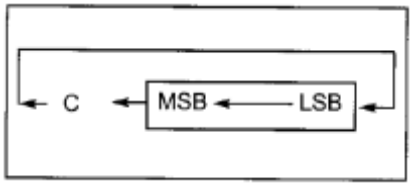

**RLNCF**




**RRCF**




**RLCF**




## Lab Exercise

**Run all questions on MPLAB and show the contents of the relevant registers.**

Find the contents of WREG register after each of the following are executed. [4]

```
MOVLW 0x39
BCF   STATUS,C
MOVWF MYREG,F
RLCF  MYREG,F
RLCF  MYREG,F

BCF   STATUS,C
MOVLW 0x4D
MOVWF MYREG
SWAPF MYREG,F
RRCF  MYREG,F
RRCF  MYREG,F
RRCF  MYREG,F
```

Write a program to find the number of zeros in a byte of data. [4]

Write a program to convert the following packed BCD numbers to ASCII. Place the ASCII codes in data RAM locations starting at 40H.

```
MYBCD_1     EQU   0x76
MYBCD_2     EQU   0x87
```

[5]

Write a program to convert the following ASCII numbers to packed BCD. Place the BCD data in RAM locations starting at 60H.

```
MYASC_1     EQU   A'8'
MYASC_2     EQU   A'7'
MYASC_3     EQU   A'9'
MYASC_4     EQU   A'2'
```

**[5]**

## Conclusion [2]