Chapter 3
Questions and Assignments

3.1 In PIC18F programming model, what is the difference between the W register and data registers?

3.2 Specify the size of the program counter and its function.

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3.3 List the registers and their addresses that are included in the access bank.

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3.4 If the BSR register holds the byte 01, identify the data register in which the following instruction copies the contents of W register: MOVWF 0x7F, 0

3.5 If the BSR register holds the byte 04, explain the result of the following instruction: MOVWF 0x7F, 1

3.6 Explain the result of the following instruction and the status of the flags affected: MOVF 0x10, 0, 1 if the data register 10_H holds the byte $9F_{H.}$

3.7 Explain the result of the following instruction and the flags affected: MOVWF 0x80, 0 if W contains 00. Identify the device that is associated with the address 80_H.

3.8 Explain the result after the execution of the following instructions if the BSR holds 01_H.

See comments:

3.9 Specify the result you expect in W register after the execution of the above instructions. Specify the flags that are set after the addition.

3.10 Identify the contents of the W register and the status of the flags by filling in the blanks as these instructions are being executed.

3.11 In Q. 3.10, if the numbers are unsigned, explain the result after the addition.

3.12 In Q. 3.10, if the numbers are signed, explain the result.

3.13 The following set of instructions is expected to load two bytes ($A7_H$ and 92_H) in data registers 01_H and 02_H, add the bytes, and save the sum in register 03_H. Read the following instructions and calculate the sum of these two bytes.

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1.    MOVLW    0xA7
2.    MOVWF    0x01,  0
3.    MOVLW    0x92
4.    MOVWF    0x02, 0
5.    ADDWF    0x01, 1, 0
6.    MOVWF    0x03, 0
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The sum = 1] 3 9 with carry.

3.14 In Q. 3.13, the ADD instruction sets the overflow and carry flag. Explain why the overflow flag is set and interpret the result if the numbers are signed numbers.

3.15 In Q.3.13, what is the total sum if the numbers are unsigned.

3.16 In Q. 3.13, explain why the W and 03_H register have the byte 92_H at the end of the program. Does the overflow discard the final answer and store the previous byte from W into register 03_H?

3.17 In Q. 3.13, identify the location where the sum is saved.

3.18 Explain the concept and the advantages of pipelining instruction.

3.19 If each one-word instruction requires two clock cycles—fetch and execute—explain the statement that each one-word instruction (with a few exceptions) executes in one cycle.

3.20 Explain why one-word branch instructions require two cycles for execution.