Tutorial 7 – Answers

Conclusion

1. Look below at the mainline for *asmFlashLED_B* (version B).

a. What has changed?
Binary value is inputted instead of bsf and bcf for PORTC.

b. When would you use method A to write to PORTC?
When only one value is supposed changed.

c. When would you use method B to write to PORTC?
When the entire 8 bit value needs to be changed.

```
again ; loop continuously turning LED ON and OFF
nop
movlw b'000001' ; turn ON LED
movwf PORTC
Dlay 2000000
nop ; turn OFF LED
movlw b'000000'
movwf PORTC
Dlay 2000000
goto again
end
```

2. How many ports are there on the P16F684?
12 Ports are present in the chip.

3. Are all ports bi-directional?
All ports are bi-directional.

4. What is the first bit# on all registers in this PIC? The last bit#?
The first bits are all 7, the last bit number is 0.

5. What three things must you do before you write or read from any ports? Why?
You must change the pin's settings in to output or input,

6. How do you use bank switching and why is it necessary?
It is necessary to be able to access the special function register because the registers that control the chip's settings are in it.

7. Why is MPLAB SIM such an important tool?
It checks all the values and results before the chip is used, as errors could potentially destroy the internal workings of the chip.

8. What does the IDE in MPLAB IDE stand for? What does it mean?
It stands for Integrated Development Environment.

9. Why, when using the *Stopwatch* window, do we have to change the processor frequency from 20MHz to 4MHz?
Because the PIC16F684 runs at 4MHz.

10. How many clock cycles does 1 instruction cycle represent?
There are 4 clock cycles.

11. How many instruction cycles equals:

a. one tenth of a second?

100000 instruction cycles.

b. one thousandth?

1000 instruction cycles.