Tutorial 3 - Answers

1. *How many available GPRs are there in Bank 0 of the 16F684?*
   Bank 0 contains **128**, which are **00h** to **7Fh**.

2. *What is the first available address (in hex) in the GPR? The last?*
   20h to **7Fh**.

3. *Which programmers can you use with the P16F684?*
   PICSTART Plus, MPLAB REAL ICE, PICkit 1/2/3, MPLAB ICD 2/3, PRO MATE II, MPLAB PM3 are the programmers.

4. *How large is the instruction set in MPASM?*
   Instruction set in MPASM is **35** commands.

5. *For the instruction movlw k, what does k represent?*
   k = **Literal field**, constant data or label.

6. *Where must all data first be written to before going to any other register?*
   Working register takes all the data before allocating them to other registers.

7. *For the instruction addwf f, d, what does f represent?*
   f = register file address (0x00 to 0x7F).

8. *For the instruction addwf f,d , what does d represent?*
   d = destination select; **d = 0** indicates store result in working register, **d = 1** indicates result in file, corresponding register.

9. *Using Notepad, open the header file p16f684.inc (run a search). What values are assigned (EQU) to W and F registers?*
   H'0000' is assigned to W register. F register is set to H'0001'.

10. *What are the two address locations of the Status Register?*
    03h, 83h are the two addresses.

11. *What would have to happen to set (logical 1) the **Z (bit 2)** bit of the Status Reg?*
    The arithmetic/logic operation must have an answer of not 0.

12. *What would have to happen to set (logical 1) the **C (bit 0)** bit of the Status Reg?*
    When 1 is carried out from the most significant bit from the result in ALU bit position.

13. *Which bit in the STATUS Register is responsible for bank selecting?*
    bit 5, register bank select bit. Indicates which bank it will message.

14. *Which bank is being selected if the Status Reg had a value of 00100110? Is the value of the Digit Carry bit set (logical 1) or cleared (logical 0)?*
    Bank 1 is being selected, the result of the arithmetic operation is not 0, The carry bit is 0, but the digit carry is 1.

15. *What is the address of the "Reset Vector"?*
    0000h contains the reset vector, interrupt vector is at 0004h.

16. *What do bits 6 and 7 represent in both PORTA and PORTC?*
    0, unimplemented location.