**Question no 1:**

**Part A:**

**Set carry and zero flag using arithematic and logical instructions:**

**Using arithematic instructions:**

MOVLW 0x05 ; this instruction stores 0000 0101 in W

ADDWF STATUS, 1 ;add W and stsus register and store result in ststus register

**Using logical instructions:**

MOVLW 0x05 ; this instruction stores 0000 0101 in W

IORWF STATUS, 1 ; this instruction takes OR of both and result saved in STATUS

**Part B:**

**IO PORTS ROLE IN DESIGN:**

IO Ports plays an important role in design of microcontroller. IO ports changes the size and bit addressibility of controller or processor.For example, if a controller has less number of IO ports then its size will be small and it can address limited number of inputs and outputs attached to it externally.On the other hand more Ioports means more hardware inputs and outputs can be connected. Also more IO ports require more pins on the controller and vice versa.

**Part C:**

Addressible memory locations:

Here x=3

So address bus is 3 bits wide

Addressible memory locations= 2^n

=2^3

Addressible momory locations= 8

**II:**

Address of memory location in YYY in binary and Hex:

Here YYY=643

In binary= 1010000011

In hex=283

**Question NO 2:**

**Program:**

Here XX=43H

CLRF TRISD ; PortD as output

MOVLW 43H

MOVWF PORTD

**Part B:**

Here YY=0x43 and XX=0x55

R0 Equ 0x43

R1 Equ 0x44

R2 Equ 0x45

Movlw 0x55 ;55h to w

MovwF R0 ;send 0x55 to R0

MovwF R1 ;send 0x55 to R1

MovwF R2 ;send 0x55 to R2

MovLw 0x00 ;send 0 to W

AddWF R0, W ;Add R0 to W

AddWF R1, W ;Add R1 to W

AddWF R2, W ;Add R2 to W

**Questin No 3**

**Part A:**

ZZ=4+3=7 SS=55H

|  |  |  |
| --- | --- | --- |
| Instruction | Wreg | C,DC,Z |
| MovLW 0x07 | 7 | C=0, DC=0 ,Z=0 |
| ADDLW 55H | 5C | C=0, DC=0 ,Z=0 |
| XORLW 55H | 5F | C=0, DC=0 ,Z=0 |

**Part B:**

**Program:**

Here File register=4

MyReg equ 04 ;

SETF TRISB ; PortB as input

MovF PORTB, W ;get input from portb

MovWf MyReg ;save to file register

Swapf MyREG,F

AddWF MYReg,1

**Question no 4**

**Part A:**

XX=43 , sum of last+1st digit=4 so FF=04

MOVLW 0x43

ADDLW 04h

0100 0011 0x43

0000 0100 0x04

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0100 0111 0x47

So C=0,Z=0 and DC=0

**Part B:**

Num1 equ FEH

Num2 equ FFH

Temp equ FDH

MOVLW Num1 ; load num1 to w

MOVWF Temp ; save num1 to temp variable

Movwf Num2 ; load num2 to w

Movwf Num1 ; save num2 to num1

Movwf Temp ; load temp to w

Movwf Num2 ; save num1 (temp) to num2