# Assignment 1

## Chapter 2

### Problem 4

(Register WREG is \_\_ bit wide)

Answer: WREG is 8 bit wide

### Problem 34

(In Q32 to place the result to file register the D bit must be\_\_)

Answer: The D bit must be 1

### Problem 39

(What is the difference between monwf and movf)

Answer:

Movwf moves the content of WREG to a fileregister.

movf moves the content of the fileregister to wreg or itself.

### Problem 48

(What is the statut of the C and Z flags agter following code”movlw FFH addwf 1)

Answer: C flag is 1 and Z flag is 1

### Problem 53

(Show a simple code to (a) load 11H into location 0-5 (B) add them to gether and place the result in WREG as the values are added. use EQU to assign names R0-R5 to location 0-5)

Answer:

R0 equ 0x10

R1 equ 0x10

R2 equ 0x10

R3 equ 0x10

R4 equ 0x10

R5 equ 0x10

org 0

movlw 11H

movwf R0

movwf R1

movwf R2

movwf R3

movwf R4

movwf R5

movlw 0

movf R0,w

addwf R1,w

addwf R1,w

addwf R2,w

addwf R3,w

addwf R4,w

addwf R5,w

End $

## Chapter 3

### Problem 7

(True or False The target of a BNZ can be anywhere in the 2M address space)

Answer: False BNZ is 2-byte instruction address must be withing 256 bytes of the program counter

### Problem 12

(Show code for a nested loop to perform an action 1000 times)

Answer:

counter1 equ 0x10

counter2 equ 0x11

movlw D’10

movwf counter1

loop:

movlw D’100

movwf counter2

loop2:

Nop

Decfsz Counter2

bra loop2

decfsz counter1

bra loop1

bra ending

ending:

bra $

### Problem 19

(True or False the RCALL target address can be anywhere in the 2M address)

Answer: False Rcall is relavtive call that can be used when the call is half of the current segment

### Problem 20

(True or false the call target address can be anywhere in the 2M address space)

Answer: True. Call is 4 bit instruction

### Problem 28

(Find the instruction cycle if the crystal frequency is 20Mhz

Assuming the cycle consists from 4 oscillator periods.

20Mhz/4 = 5MHz 🡺 Intstruction cycle = 1/5MHz = 200nanoseconds

Answer: instruction cycle: 200 nanoseconds

## Chapter 4

### Problem 12

(Write program to get 8-bit data from Port D)

Answer:

BSF portC

BSC portB

BSC portD

kierros1:

BTFSC portC, 8

Bra Kierros2

BCF portB,8

BCF portD,8

Goto kierros1

kierros2:

BSF portB,8

BSF portD,8

Goto Kierros1

### Problem 15

Write a program to toggle all the bits of Port B and Port c continuously

1. using AAH and 55H
2. using COMF instruction

(a)

counter egu 0x10

luku equ 0x11

Org 0

movlw 55H

movwf luku

movlw AAH

Silmukka: | Delay:

movff luku portB | movlw .250

call delay | movwf counter

movff luku portC | Tauko:

call delay | nop

addwf portB, f | nop

call delay | nop

addwf portC, f | decf counter

Bra Silmukka | bnz Tauko

| movlw AAH

| return

(b)

counter egu 0x10

Org 0

movlw 55H

movwf portB

movwf portC

Silmukka: | Delay:

compf portB,f | movlw .250

compf portC,f | movwf counter

call delay | Tauko:

Bra Silmukka | nop

| nop

| nop

| decf counter

| bnz Tauko

| movlw AAH

| return

### Problem 21

(Write a program to toggle RD3,RD7 and RD5 constantly without disturbing the rest of the bitts)

Org 0

clrf pordD

Silmukka:

BTFSC portD,3

Bra pone

BTG portD,3

BTG portD,7

BTG portD, 5

Bra Silmukka

pone:

BTG portD,3

BTG portD,7

BTG portD, 5

Bra Silmukka

### Problem 24

(Write a program to monitor the RE0 bit when it is high send 99H to port B if its low send 66H to port C)

Org 0

setf PortE

clrf portB

clrf portC

Silmukka:

BTFSS port E, 0

Bra Onolla

movlw 99H

movwf portB, f

Bra Silmukka

Onolla:

movwl 66H

movwf portC, f

Bra Silmukka