Part 2a)

ldi r16, 0xff

Out DDRB, r16; Sets all of port b to be output

cbi portb, 0

cbi portb, 1

sbi portb, 2

sbi portb, 3

sbi portb, 4

sbi portb, 5

cbi portb, 6

cbi portb, 7 ; sets portb to 1100 0011 or 0xC3 with active low

part 2d)

ldi r16, 0xff

out DDRB, r16

ldi r16, 1;

call loop;

end: rjmp end

loop:

out portb, r16;

rol r16;

rjmp loop

part 2f)

ldi r16, 0xff

out DDRB, r16

ldi r16, 1;

call loop;

end: rjmp end

loop:

out portb, r16;

rol r16;

clr r0

ldi r18,0x00

ldi r19, 0x35

ldi r20, 0x0C ; loads a total value of 800,000

call delay

rjmp loop

delay:

subi r18,1;

subc r19, r0;

subc r20, r0;

brne delay; delays for 5microseconds \* value of R20:R18

; 800000 \* 5 = 4000000microseconds

Ret;

3a)

PORTD = inputs

PORTB = outputs

Clr r16

Out DDRD, r16

Ldi r16, 0xff

Out DDRB, r16

Out Portb, r16; default output, use r16 to track portb’s values (initial 0xFF)

Call loop:

In r17, portd

Ldi r18, 0xff

Sub r18, r17

And r16, r18 ; updates new output with the new 0 values

; structured after the cbr instruction

Or r16, r17 ; updates the new output with the new 1 values

; structured after the SBR instruction

Out portb, r16

Rjmp loop

3e)

PORTD, 0 = input (assuming active high)

PORTB = outputs

Clr r16

Out DDRD, r16

Ldi r16, 0xff

Out DDRB, r16

Out portb, r16

Call LoopLow

LoopLow:

Ldi r17, 200

Call delay

Sbis portd,0

Rjmp LoopLow

Dec r16

Out portb, r16

LoopHigh:

Ldi r17, 200

Call delay

Sbic portd, 0

Rjmp LoopHigh

Rjmp LoopLow

Delay:

Dec r17

Brne delay

ret