



1. You should attempt ALL requested parts.
2. You should write your answers clearly.

Nº of Questions: 4 in 3 page(s)
Total Mark: 50

Question1: True or False

(?? pts)

1. A device driver is a set of software functions that facilitate the use of an I/O port.
2. There's an output only pins on Tm4c123.
3. 20. We should use these 2 functions together to clear the screen

```
Nokia5110_ClearBuffer();
```

```
Nokia5110_DisplayBuffer();
```

Question2: Multiple Choice Questions

(?? pts)

1. _____ signifies signed overflow.
 - a. N
 - b. Z
 - c. V
 - d. C
2. Which line of C code is a friendly way to set Port B bit 2 assuming this pin has already been initialized as an output
 - a. `GPIO_PORTB_DATA_R = 0x00;`
 - b. `GPIO_PORTB_DATA_R = 0x02;`
 - c. `GPIO_PORTB_DATA_R = 0x04;`
 - d. `GPIO_PORTB_DATA_R |= 0x02;`
 - e. `GPIO_PORTB_DATA_R |= 0x04;`
 - f. `GPIO_PORTB_DATA_R &= 0x02;`
 - g. `GPIO_PORTB_DATA_R &= 0x04;`
 - h. `GPIO_PORTB_DATA_R &= ~0x02;`
 - i. `GPIO_PORTB_DATA_R &= ~0x04;`

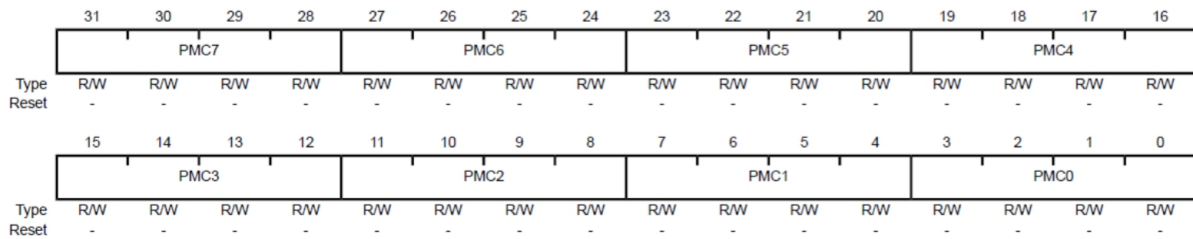
Question3: Complete

(?? pts)

1. Configure the PMCN fields in the GPIOCTL register to assign the UART signals to the pin PA1 using the following 2 Figures:

IO	Pin	Analog Function	Digital Function (GPIOCTL PMCx Bit Field Encoding) ^a												
			1	2	3	4	5	6	7	8	9	14	15		
PA0	17	-	U0Rx	-	-	-	-	-	-	-	-	CAN1Rx	-	-	-
PA1	18	-	U0Tx	-	-	-	-	-	-	-	-	CAN1Tx	-	-	-

Register 22: GPIO Port Control (GPIOCTL), offset 0x52C



Bit/Field	Name	Type	Reset	Description
31:28	PMC7	R/W	-	Port Mux Control 7 This field controls the configuration for GPIO pin 7.
27:24	PMC6	R/W	-	Port Mux Control 6 This field controls the configuration for GPIO pin 6.
23:20	PMC5	R/W	-	Port Mux Control 5 This field controls the configuration for GPIO pin 5.
19:16	PMC4	R/W	-	Port Mux Control 4 This field controls the configuration for GPIO pin 4.
15:12	PMC3	R/W	-	Port Mux Control 3 This field controls the configuration for GPIO pin 3.
11:8	PMC2	R/W	-	Port Mux Control 2 This field controls the configuration for GPIO pin 2.
7:4	PMC1	R/W	-	Port Mux Control 1 This field controls the configuration for GPIO pin 1.

GPIO_PCTL_R |= _____

2. Stellaris® micro-controller powered with _____ V supply, a voltage between 2 and 5 V is considered _____, and a voltage between 0 and 1.3 V is considered _____ while a voltage between 1.3 and 2 V is considered _____.
3. _____ Interface is one where binary data are available simultaneously on a group of lines.

Question4: Short Answer Questions

(?? pts)

1. Let D be an 8-bit number, and consider the operation $D = D | 0x20$. How does this operation affect D?
2. How many binary bits does it take to represent 0x123456?
3. What is the main difference between microprocessor and micro-controller?
4. What's real time system?

Question5: Design

(?? pts)

1. Write an implementation for the PORTF_Peripherals.h file shown in the following Figure:

```
// Subroutine to initialize port F pins for input and output
// PF4 and PF0 are input SW1 and SW2 respectively
// PF3,PF2,PF1 are outputs to the LED
// all the pins are digital not analog pins
// Inputs: None
// Outputs: None
// Notes: These five pins are connected to hardware on the LaunchPad

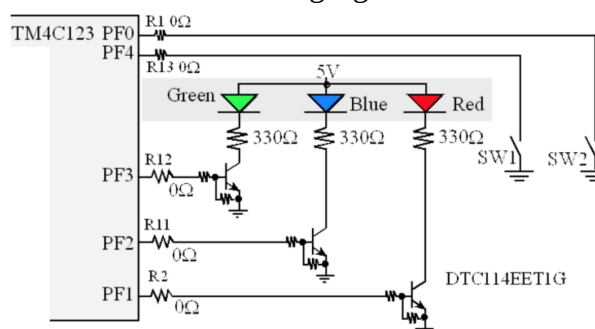
// Subroutine to toggle the red led as if the led is on, then it should
// be off and if the led is off, it should be on
// Inputs: None
// Outputs: None
void toggleRedLed();

// Subroutine to toggle the blue led as if the led is on, then it should
// be off and if the led is off, it should be on
// Inputs: None
// Outputs: None
void toggleBlueLed();

// Subroutine to turn on or off the red led depending on the val passed
// if val = 0, then the red led should be off
// if val = 1 then the red led should be on
// Inputs: integer val
// Outputs: None
void writeRedLed(int val);

// Subroutine to turn on or off the blue led depending on the val passed
// if val = 0, then the blue led should be off
// if val = 1 then the blue led should be on
// Inputs: integer val
// Outputs: None
void writeBlueLed(int val);
```

The led connections are shown in the following figure:



Good Luck

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