QUIZ 8 - Serial Communication - UART

1) For changing the serial communication speed to 9600 baud rate, which one of the configurations can be use? (PCLK 60 MHz) You have to use the formula on page 508 of the user manual.

Serial_UART->DLM = 0x01;
Serial_UART->DLL = 0x25;
Serial_UART->FDR = 0x01 << 0 | 0x03 << 4;

2) For configure the serial communication as 8-bit character transfer, 1 Stop bit and Even Parity. What can be the value of LCR register?

LCR = 3 << 0 | 0 << 2 | 1 << 3 | 1 << 4;

3) Which register contains the next received character to be read?
RBR

4) Which register contains information for there is an unread character in the FIFO or not?
LSR

5) Which code can be used for checking Transmitter Holding Register is empty or not?

LSR & 1<<5

6) Which one of the error cannot be detected via LSR register?
  + Overrun Error

  + Framing Error

  + Parity Error

  - Bus Error

7) char c = '5'
Which statement does not give the integer value of c?

int value; value = c & 0xFF

8) int result = -1
char resultString[12];
sprintf(resultString, "%d\r\n", result);

What is the content of the resultString variable?

"-1\r\n"

QUIZ 7 - Analog to Digital Converter

1) Which type of IOCON is used for the pins that include an analog function?
Type A IOCON

2) In order to use a pin in Analog mode, the MODE field should be: **Inactive**

3) What is the resolution of the ADC in LPC4088? **12 bit**

4) What is the max clock frequency for the A/D converter? **12.4 MHz**

5) In order to configure the clock frequency of the ADC to 1 MHz, what should be the CLKDIV value in CR register?
(PCLK is 60 MHz) **59**

6) Which data register stores the convertion result of AD0[2] pin? **DR2**

7) Which bits of data register contain the conversion result of the pin? **15:4**

8) What is the value of VREFP in LPC4088?
3.3V

9) When you measure 2V analog value, and VREFP = 3.3V, what is the digital value according to the ADC in LPC4088?
0x9B1

10) According to the circuit in LAB 9 document. You read 0x7FF as the digital value and VREFP = 3.3V. What is the LUX value?
 700

QUIZ 6 - Power Saving & Multiple Interrupts

1) Which pin is connected to the push button on the LPC4088 board? **P2.10**

2) Which register is used to selecting the level or edge sensitivity of external interrupt pin?
EXTMODE

3) System Control Register controls features of entry to and exit from low power state. Which bit of the SCR is used for controling whether the processor uses sleep or deep sleep as its low power mode? **2**

4) What is the address of the System Control Register?
0xE000ED10

5) Any reduced power mode begins with the execution of :
either a WFI (Wait For Interrupt) or WFE (Wait For Exception)

6) In order to enter Deep Power-down mode, what should be the value of PM1, PM0 in PCON register? **11**

7) Which code is used for entiring Power Down Mode?
SCR = 1 << 2;
PCON = 1 << 0;

8) Which interrupt does not wake-up board from Power-down mode?

+ Ethernet Wake-on-LAN Interrupt

- PWM Interrupts

+ GPIO Interrupts

+ External Interrupts

QUIZ 5 - Ultrasonic Sensors

1) What is the min range of Ultrasonic Sensor (HC-SR04)? **2cm**

2) What is the max range of Ultrasonic Sensor (HC-SR04)? **400cm**

3) What is the length of the trigger signal of Ultrasonic Sensor (HC-SR04)? **10uS**

4) What is the suggested period of Ultrasonic Sensor for measuring the distance? **60ms**

5) When Ultrasonic Sensor's Echo Pin gives High value with 1000 uS width, what is the distance of the obstacle to ultrasonic sensor?
17.2 cm

6) In order to give a square signal with length 10 microsecond by using P11 which has initially LOW value. What is the sequence of the actions?

1-Change P11 output as HIGH
2-Wait 10 microseconds
3-Change P11 output as LOW

7) When an interrupt occurs for Capture 1 of Timer3, in order to clear that interrupt, what should be done?
TIMER3->IR = 1 << 5;

8) Which register is used for toggling the external match pin value, when a match occurs? **EMR**

QUIZ 4 - Speed Sensor & Input Capture

1) Which pin of the motor speed sensor is for detecting the change on the Infrared Light?
OUT

2) What is the address of the Timer3 TCR register? **0x4009 4004**

3) Which mode of the Timer is used for increasing TC register value when the Prescale Counter matches the Prescale register? **Timer Mode**

4) Which Timer register is used for enabling The PWM Timer Counter and PWM Prescale Counter? **TCR**

5) In order to increment Timer Counter (TC) on every 2 PCLK, what should be the value of PR? **1**

6) In order to increment Timer Counter (TC) on every 1 microsecond, what should be the value of PR? (PCLK = 60Mhz)
PCLK / 1000000 - 1

7) The Capture Control Register is used to control whether one of the four Capture Registers is loaded with the value in the Timer Counter when the capture event occurs. In order to capture on rising and falling edge of the cap0, what should be the value of CCR register? **(1 << 0) | (1 << 1)**

8) When rising or falling edge occurs on the CAP0, which register contains the TC value when event occurs? **CR0**

QUIZ 3 - Motor Controller

1) When PWM Match register value is changed, which register enables use of updated PWM match values?
LER

2) Which match register is used for P29 (P1_3)? **MR2**

3) In order to remove the reset on the PWM Timer Counter, which should be made?

In TCR, CR bit should be LOW

4) What is the recommend PWM duty cycle for L298N motor driver? **90% or less**

5) For changing the speed of the motor with L298N motor driver, which input pins of the motor driver shoud be connected to PWM? **ENA and ENB**

6) According to direction pin values of L298N motor driver, motor can change its direction. In order to turn the motor in forward direction, what should be the value of direction pins. (Motor is connected to the Output A of the motor driver)

IN1=HIGH, IN2=LOW

7) Which one of the action do not stop the motor which is connected the Output A of the motor driver?
ENA = HIGH IN1 = LOW IN2 = HIGH

QUIZ 2 - Pulse Width Modulation

1) Which port contains all the pins of Joystick? **PORT5**

2) If the value of PIN register which Joystick pins are connected is 0x1B, which Joystick button is pressed? **Up**

3) Which one is not one of the functionalities of P30 (P1_2) pin?

ENET_TXD2 — Ethernet transmit data 2 (MII interface).

PWM0[1] — Pulse Width Modulator 0, output

PWM1[2] — Pulse Width Modulator 1, output

SD_CLK — Clock output line for SD card interface.

4) Match the purpose of the PWM registers?

a) Controls the operation of the PWM Timer Counter - TCR
b) Enable and selects the type of each PWM channel - PCR
c) Continuously compared to the PWM Timer Counter value - MR0

5) In order to enable the PWM output for a pin, which register should be used? **PCR**

6) In order to configure MR0 register for giving pulse every 200 ms, what should be the value of MR0 register? (PCLK is 60MHz)
(PCLK / 1000000) * 200 * 1000

7) Suppose we want to generate a PWM signal with a duty cycle of 25% for a pin which is connected to Match Register 1. What should be the approximate value of MR1? (Always True) **%25 of MR0**

QUIZ 1 - LEDs & GPIO

1) What is the purpose of PCONP register? **Turning off selected peripheral functions for the purpose of saving power.**

2) What is the address of PCONP register? **0x400F C0C4**

3) How many GPIO Port exists in our LPC4088 Board? **6**

4) What is the address of GPIO PIN register of PORT 1? **0x2009 8034**

5) Which register controls the direction of the pins? **DIR**

6) For Type D IOCON registers, what is the default functionality for the pin? **GPIO**

7) P1_13 is configured as and output and only P1_13's output value should be changed to HIGH, which code should be used?
(PIN1 is the PIN register of the port 1 and DIR1 is the DIR register of port 1)
PIN1 I= 1 << 13

8) Which pins are used for lighting RGB - LED? **P1.11 - P1.5 - P1.7**

9) In order to change color of RGB LED to Red, what should be the pin values?
Red Pin : 0 - Blue and Green Pins : 1

10) In order to change color of RGB LED to Magenta, what should be the pin values?
Red and Blue Pins : 0 --- Green Pin : 1