Quiz Submissions - Midterm Exam

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Attempt 1

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Submission View

Your quiz has been submitted successfully.

Question 1 **1 / 1 point**

All general purpose I/O pins on the Teensy 3.2 are PWM.

- ( ) True
- (✓) False

Question 2 **1 / 1 point**

All general purpose I/O pins on the Teensy 3.2 are capable of running an ISR.

- (✓) True
- ( ) False

Question 3 **5 / 5 points**

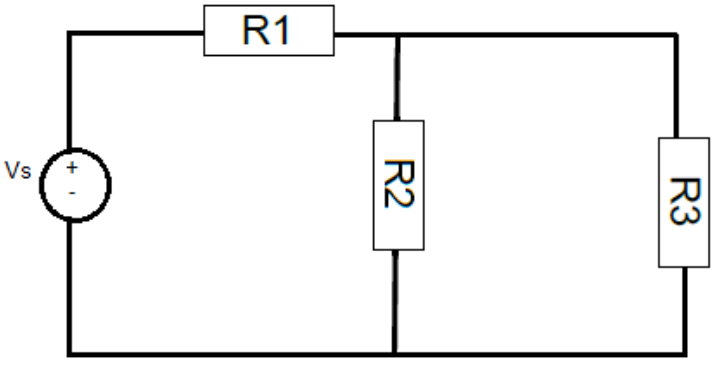
Calculate the total resistance for the following circuit: [5 marks]

Vs = 10 volts

R1 = 10 KΩ

R2 = 2 KΩ

R3 = 2 KΩ



- ( ) a) 20.75 KΩ
- (✓) b) 11 KΩ
- ( ) c) 10 KΩ

d) 10.8 KΩ

Question 4 **5 / 5 points**

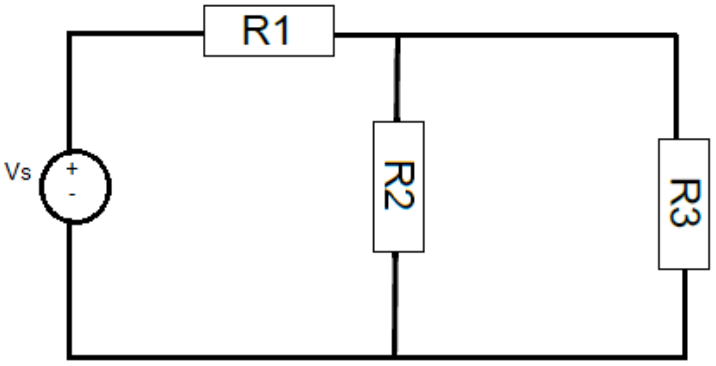
Calculate the total resistance for the following circuit: [5 marks]

Vs = 10 volts

R1 = 20 KΩ

R2 = 3 KΩ

R3 = 2 KΩ



a) 12 KΩ

b) 18.8 KΩ

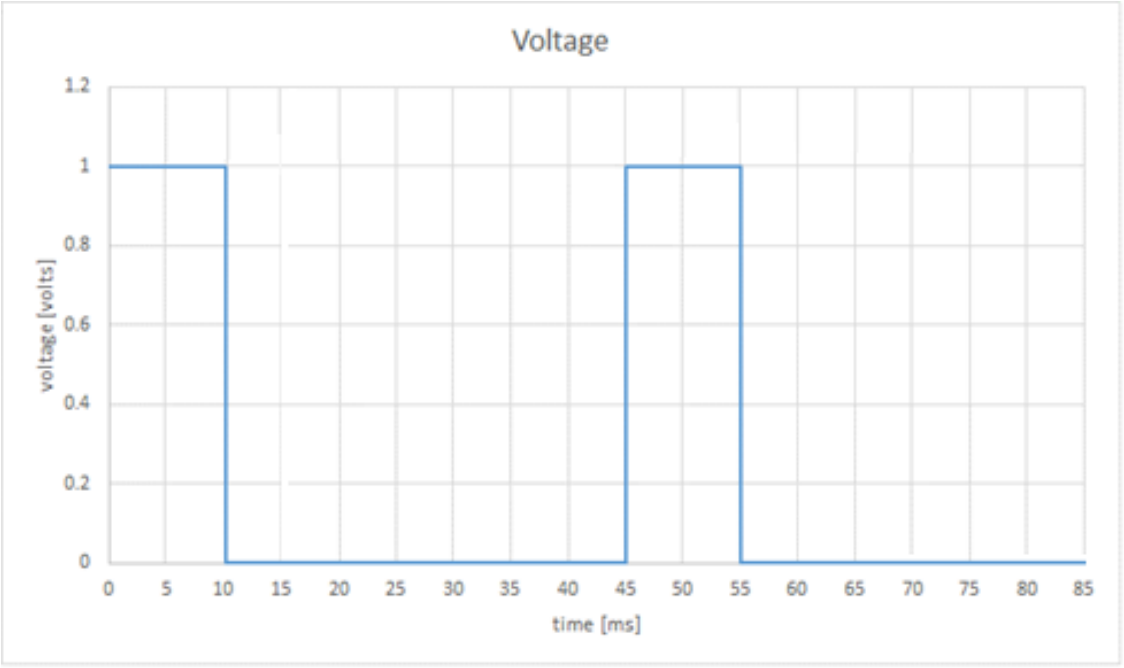
c) 30.75 KΩ

✔ d) 21.2 KΩ

Question 5 **2 / 2 points**

Answer the following questions pertaining to pulse width modulation:

Calculate the duty cycle of the waveform [2 marks]



a) 10.5

b) 44.4

✔ c) 22.2

d) 33.3

Question 6 **1 / 1 point**

The Teensy microcontroller has three types of memory pools: Flash, RAM, and EEPROM. Which of these memory pools loses its contents when the chip loses power?

a) Both RAM and EEPROM

b) Flash

c) EEPROM

✔ d) RAM

e) Both Flash and RAM

Question 7 **1 / 1 point**

What functions must be defined in every Arduino (and Teensy) program?

✔ a) void setup() and void loop()

b) void setup() and void run()

c) void init() and void run()

d) void setup() and void while()

e) void init() and void loop()

Question 8 **1 / 1 point**

Which keyword modifier should be included when declaring variables that are used in both the main routine and also an interrupt service routine (ISR)?

a) const

b) static

✔ c) volatile

d) int

e) void

Question 9 **1 / 1 point**

Suppose you want to multiplex two shift registers (SR) together. Which pin of SR #1 do you connect to SER of SR #2?

a) RCLK

b) SRCLR

c) SRLK

d) SER

✔ e) QH' (QH prime)

Question 10 **1 / 1 point**

Which pin on a shift register is known as the *master reset*?

a) SER

b) RCLK

c) SRCLK

✔ d) SRCLR

e) OE

Question 11 **1 / 1 point**

Within a Teensyduino sketch, where do you call the attachInterrupt(pin, ISR, mode) function?

a) init()

✔ b) setup()

c) Within the ISR function

d) loop()

e) Serial.println()

Question 12 **1 / 1 point**

Within a Teensyduino sketch, which function should you call to initialize the Serial Monitor?

- ✔ a) Serial.begin()
- b) Serial.println()
- c) Serial.init()
- d) Serial.start()
- e) new Serial()

Question 13 **0 / 1 point**

The Teensy microcontroller has three types of memory pools: Flash, RAM, and EEPROM. Which of these memory pools is used to store the contents of variables during program execution?

- ✖ a) Both Flash and RAM
- b) EEPROM
- c) Both RAM and EEPROM
- d) Flash
- ➡ e) RAM

Question 14 **1 / 1 point**

A common anode 7-segment display is a device that ...

- ✔ a) Has all of the anodes connected together
- b) Has all anodes connected to ground (0 volts)
- c) None of these answers

d) Has all of the cathodes connected together

e) Has all of the cathodes connected to Vcc (the power supply)

Question 15 **1 / 1 point**

The function pinMode(pin, mode) configures the specified pin to behave in three possible modes. Two of the modes are INPUT and OUTPUT. What is the third mode?

a) INPUT_PULLDOWN

b) PWM

✔ c) INPUT_PULLUP

d) DIGITAL

e) ANALOG

Question 16 **1 / 1 point**

What is the standard processor speed of a Teensy 3.2?

a) 16 MHz

✔ b) 72 MHz

c) 96 MHz

d) 32 MHz

e) 48 MHz

Question 17 **1 / 1 point**

The Teensy microcontroller has three types of memory pools: Flash, RAM, and EEPROM. Which of these memory pools retains its contents when the chip loses power?

a) Flash

b) EEPROM

c) Both RAM and EEPROM

✔ d) Both Flash and EEPROM

e) RAM

Question 18 **1 / 1 point**

How many shift registers (the ones used in the course) would need to be connected together, so that the output of the entire shift register circuit has the same size bus as the ARM Cortex chip that is on board the Teensy 3.2?

✔ a) 4

b) 6

c) 2

d) 8

e) none of these answers

Question 19 **1 / 1 point**

Suppose you were to open a shift register component. Inside you would notice two (2) registers. Identify these two (2) internal registers.

a) Shift Register and Clear Register

b) Serial Register and Storage Register

c) Input Register and Output Register

✔ d) Shift Register and Storage Register

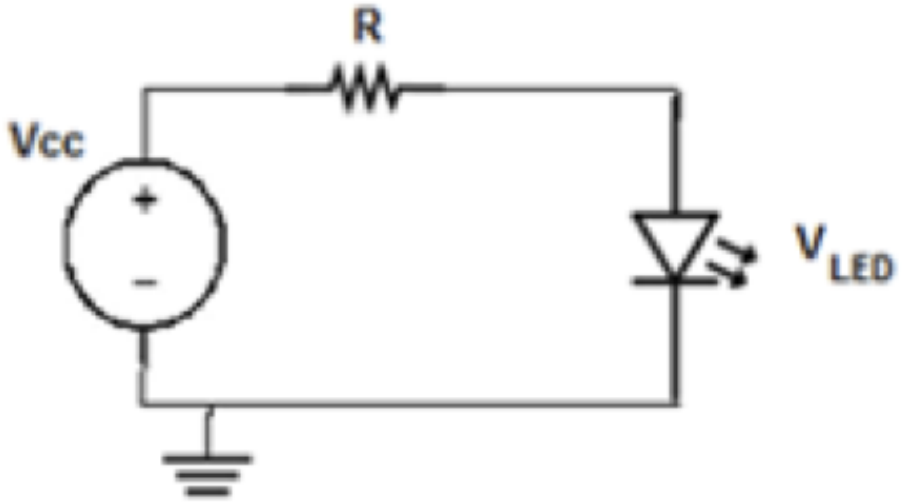
e) Serial Register and Qa - Qh Register

Question 20 **1 / 1 point**

What is the resistance of a resistor with the colour bands: Orange, Grey, Orange _____?

Answer: 38000 ✔

Question 21 **6 / 6 points**



Refer to the schematic (image). It has a power supply Vcc, a resistor R, and a LED. Assume that Vcc = 6.0 volts. Assume that the LED is a Kingbright Green LED. Refer to the Appendix for the Kingbright LED datasheet and answer the questions below. The target current that the circuit should allow is 5 mA.

What is the voltage drop across the LED under the target conditions?

The unit is Volts (V). Enter your answer to one (1) significant digit after the decimal point. Do not enter the units.

Correct: 5.3, 1.0, 2.9

Incorrect: 5.34, 1, 2.9899, 3.14 volts

___1.9___ ✔(35 %)

Refer to the schematic (image). It has a power supply Vcc, a resistor R, and a LED. Assume that Vcc = 6.0 volts. Assume that the LED is a Kingbright Green LED. Refer to the Appendix for the Kingbright LED datasheet and answer the questions below. The target current that the circuit should allow is 5 mA.

Calculate the size of a resistor such that the target current 5 mA is obtained?

The unit is (Ohms). Enter your answer as a whole number (an integer). Do not enter the units.

Correct: 540

Incorrect: 540.39 540 ohms

___820___ ✔(65 %)

Short Answer

Question 22 **3 / 3 points**

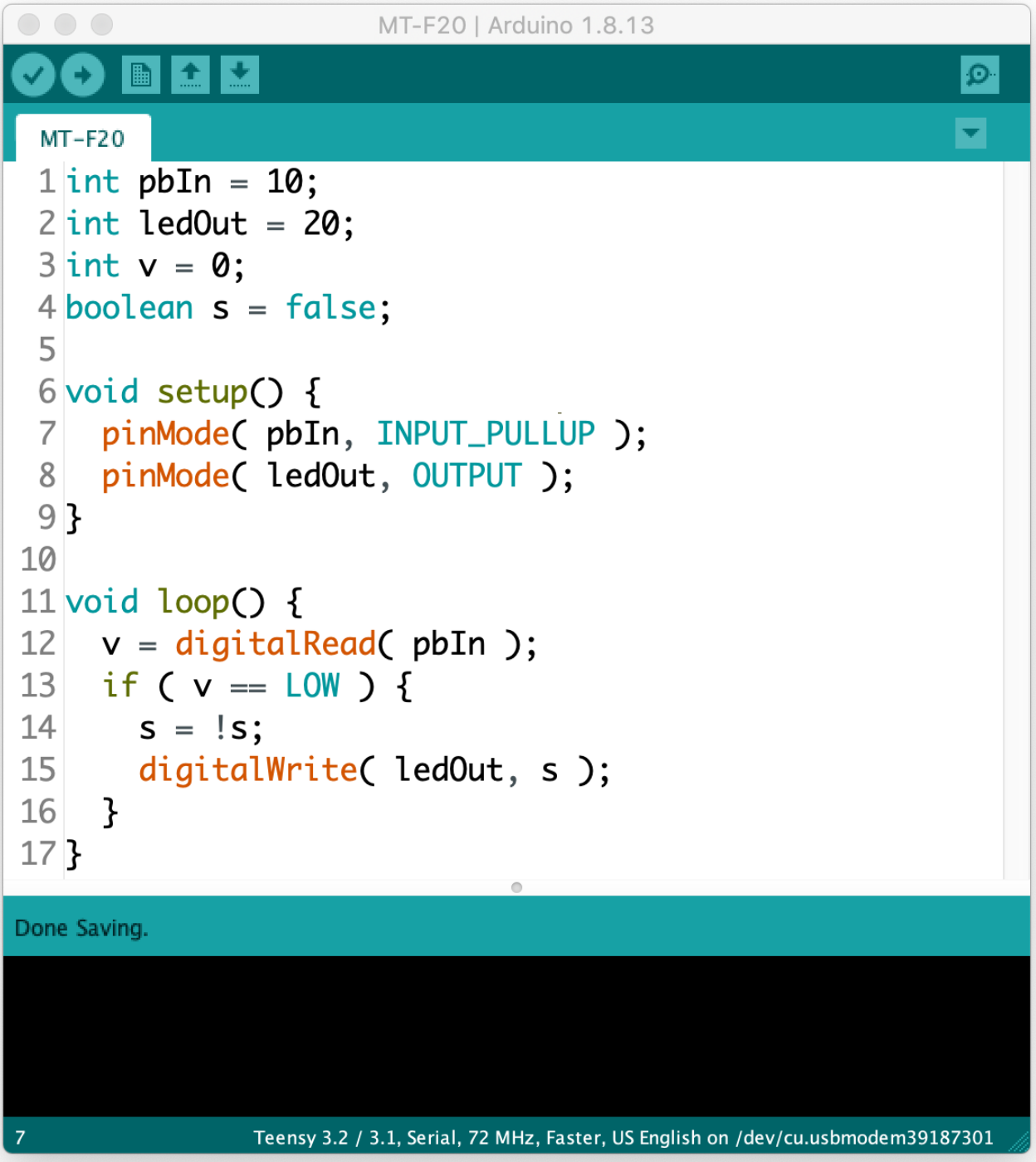
List three (3) different kinds of events where the use of an interrupt is superior to the use of a polling loop.

1. The event is asynchronous, it is unexpectable, user has no idea when it happens
2. The event is not frequent, so that using polling is a waste of cpu efficiency
3. The event is urgent

The correct answer is not displayed for Written Response type questions.

Question 23 **0.5 / 2 points**

Consider this Teensyduino sketch:



Describe the behaviour of the Teensyduino sketch [2 points].

1. After compiling and uploading the sketch to the Teensy, what is the status of the discrete LED after the first press of the push-button switch (PBS)?
2. What is the status of the discrete LED after the second press of the PBS?

When the button is not pressed, the internal pull up resistor is connected, it(v) reads high, the led is not lighted up.(it does not go to the if statement at all)

and when the pbs is pressed, v == LOW, and led is lighted up.

so, when the button is first pressed, the led is lighted, when the button is released, it lights out the led

When the second time the PBS is pressed, the led is lighted up again.

The correct answer is not displayed for Written Response type questions.

View Feedback

Attempt Score: 37.5 / 40 - A+

Overall Grade (highest attempt)**:** 37.5 / 40 - A+

Done