

This print-out should have 13 questions, check that it is complete. Multiple-choice questions may continue on the next column or page: find all choices before making your selection. The due time is Central time.

EE319K Chapter 6 homework

001 (part 1 of 1) 0 points

This question will be killed. I am using it to test the random number generator.

R1 is 3800 Ω .

R2 is 520 Ω .

V1 is 1600 volts.

V2 is 460 volts.

N1 is 22.

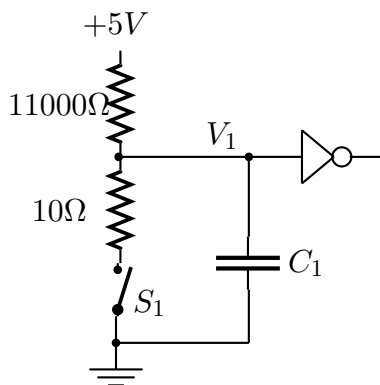
N2 is 540.

If you need to know the answer is 460 volts.

Answer in units of volts.

002 (part 1 of 2) 10 points

The following figure shows the electronic circuit used to interface a switch to an input port of the microcomputer.



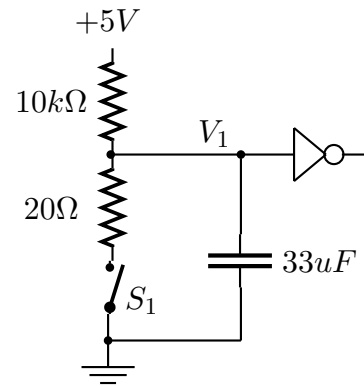
What is the voltage V_1 when the switch is not pressed (the switch is an open circuit)? Answer in units of volts.

003 (part 2 of 2) 10 points

What is the voltage V_1 when the switch is pressed (the switch is a closed circuit)? Answer in units of volts.

004 (part 1 of 2) 10 points

This circuit interfaces a switch to an input port of the microcomputer.



What is the purpose of the **33uF** capacitor?

1. None of these choices is correct.

2. Some switches mechanically bounce (go on off multiple times) when touched or released. The capacitor eliminates the electrical bouncing caused by the mechanical bouncing.

3. The capacitor helps raise the voltage when the switch is not pressed so that it looks like a logic high.

4. The capacitor provides power to the switch in case regular power is temporarily lost.

5. The capacitor helps lower the voltage when the switch is pressed so that it looks like a logic low.

005 (part 2 of 2) 10 points

What is the purpose of the **20Ω** resistor?

1. None of these choices is correct.

2. Some switches mechanically bounce (go on off multiple times) when touched or released. The resistor eliminates the electrical bouncing caused by the mechanical bouncing.

3. The resistor helps lower the voltage when the switch is pressed so that it looks like a logic low.

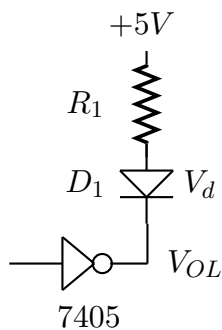
4. The resistor prevents sparks from burning

out the switch.

5. The resistor helps raise the voltage when the switch is not pressed so that it looks like a logic high.

006 (part 1 of 1) 10 points

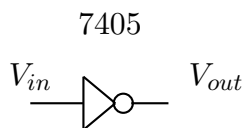
The following figure shows the electronic circuit used to interface an output port of the microcomputer to a LED. Assume the value of desired operating point of the LED is $V_d = 2.8$ V, and the value of resistor $I_d = 14$ mA. Assume also the output low voltage of the 7405 is $V_{OL} = 0.5$ V.



What value for the resistor R_1 should be used? Answer in units of Ω .

007 (part 1 of 1) 10 points

The **7405** is an open collector inverter used to interface LEDs to the microcomputer.



Which answer best describes the input/output functionality of the 7405?

1. If V_{in} is low then V_{out} will be high. If V_{in} is high then V_{out} will be low.
2. If V_{in} is low then V_{out} will be low. If V_{in} is high then V_{out} will be off, which means neither high or low.
3. none of these choices is correct

4. If V_{in} is low then V_{out} will be low. If V_{in} is high then V_{out} will be high.

5. If V_{in} is low then V_{out} will be off, which means neither high or low. If V_{in} is high then V_{out} will be low.

008 (part 1 of 1) 10 points

Which answer best describes the voltage protocol used in **RS232** communication?

1. A logic high (true) is encoded as -12V, while a logic low (false) will be +12V.
2. A logic high (true) is encoded as 0V, while a logic low (false) will be +12V.
3. A logic high (true) is encoded as 0V, while a logic low (false) will be +5V.
4. A logic high (true) is encoded as +12V, while a logic low (false) will be 0V.
5. A logic high (true) is encoded as +5V, while a logic low (false) will be 0V.
6. A logic high (true) is encoded as +12V, while a logic low (false) will be -12V.
7. none of these choices is correct

009 (part 1 of 1) 10 points

What is the resolution of the built-in ADC on the MC68HC812A4? Give your answer in volts.

Answer in units of volts.

010 (part 1 of 1) 10 points

Assume the ADC precision is 10 bits, and the range is from 0 volts to 10 volts. What is the resolution of this ADC? Give your answer in volts.

Answer in units of volts.

011 (part 1 of 1) 10 points

How do you start a **ADC conversion** on the MC68HC812A4?

1. Set the start bit in the ATDCTL2 register.
2. none of these choices is correct
3. Clear the done bit in the ATDSTAT status register.
4. Write a number into the ATDCTL5 register specifying which channel to convert.
5. Write into the PORTAD register.

012 (part 1 of 1) 10 points

A four-step output sequence repeated over and over will cause a stepper motor to spin. Which output sequence will rotate a **stepper motor**?

1. 1,2,3,4,1,2,3,4,...
2. 0,1,2,3,0,1,2,3,...
3. 9,10,6,5,9,10,6,5,...
4. none of these choices is correct
5. 1,2,4,8,1,2,4,8,...

013 (part 1 of 1) 10 points

Assume a stepper motor has 25 steps/rot, and the software outputs a new command every 64 ms/step. Assuming the motor has not stalled, what is the rotational speed of this stepper? Give your answer in rpm.

Answer in units of rpm.