Final Exam

⚠ **This is a preview of the published version of the quiz**

Started: Jun 14 at 8:57pm

Quiz Instructions

Timed, one trial -- don't start unless you're confident of 1-2 hours uninterrupted time (time limit extended to 150 min). Open notes. There are 24 questions.

For numerical answers, just enter the number (e.g., if its 4.2 volts, enter 4.2, not 4.2V or 4200mV. I specify units for your answer, e.g., mW = milliwatts, so make sure your numerical answer is in the stated units and just enter the number (else Canvas will mark it wrong).

2 significant figures are adequate.

For 3 points additional credit (and no time limit), answer the following questions and upload to Canvas (on an assignments page):

1) What was the most important thing you learned in this class?

2) What was your most and least favorite aspects of the class, and recommendations for changes?

3) What grade do you think you deserve and why? (Before answering, please review the Syllabus as a rubric.)

⋮⋮

Question 1 1 pts

What is the voltage at A?

⋮⋮
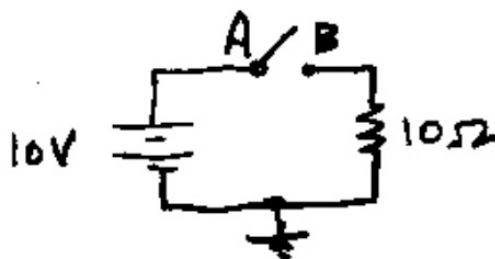
Question 2 1 pts

What is the voltage at point B in the previous circuit?

⋮⋮

Question 3 1 pts

What is the power dissipated by R2 (answer numerically in Watts)?

⋮⋮

Question 4 1 pts

The voltage source in Problem 3 is replaced by a 1A current source. What is the <u>voltage</u> across R1?

⋮⋮

Question 5 1 pts

The diode is a silicon rectifier with Vf = 0.7V. What is the power **(in mW)** dissipated by R = 10 ohms
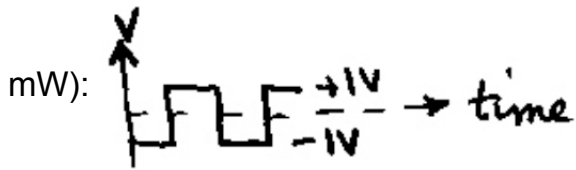
with V = 1V?

⋮⋮

Question 6 1 pts

Same circuit and question as the last one, with V = -1V (answer in mW).
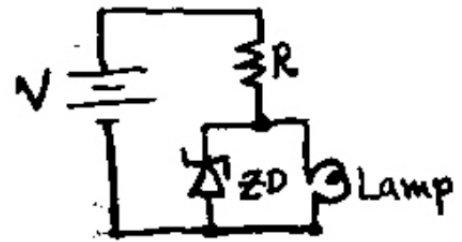
⋮⋮

Question 7 1 pts

Same circuit and question as the last one, with V = a square wave with +-1V amplitudes (answer in mW):

[   ]

⋮⋮

Question 8 1 pts

When the lamp burns out, the power dissipated in the resistor ...

○ decreases

○ stays the same

○ increases

⋮⋮

Question 9 1 pts

Same circuit as above, when the lamp burns out, the power dissipated by the zener diode ...

○ decreases

○ stays the same

○ increases

⋮⋮

Question 10 1 pts

When a diode is forward biased and the bias voltage increases a little

○ the current decreases a little

○
the current decreases a lot

○
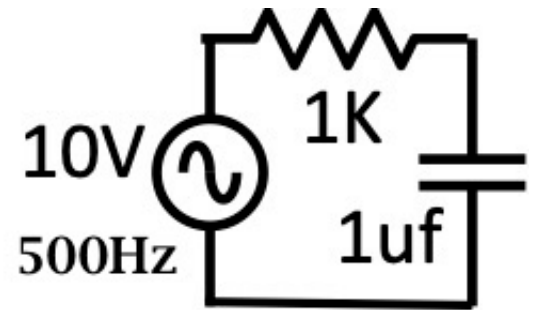the current increases a little

○
the current increases a lot

⸬

Question 11 1 pts

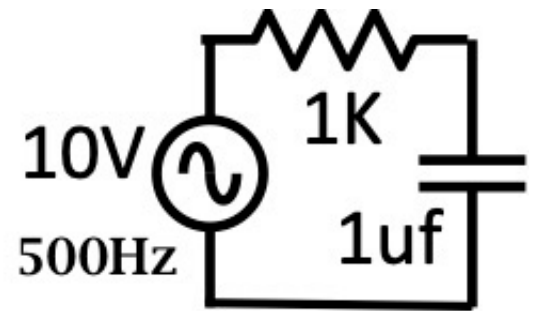In the sinusoidal AC circuit at right, what is the voltage (in volts) measured across the capacitor?

○
1

○
3

○
5

○
7

○
9

⸬

Question 12 1 pts

Same AC sinusoidal circuit, how many volts are measured across the resistor?
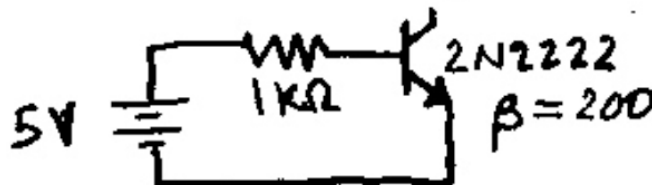
○ 1

○ 3

○ 5

○ 7

○ 9

Question 13 1 pts
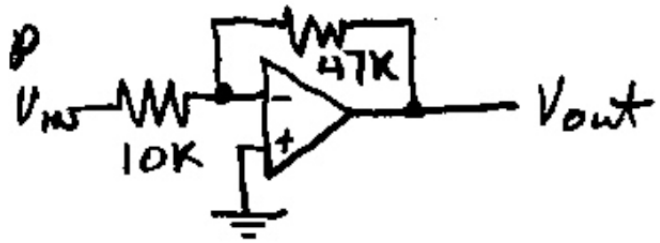
What is the charging time constant **(in msec)**?

Question 14 1 pts

What is the base current, iB **(in mA)**?

Question 15 1 pts

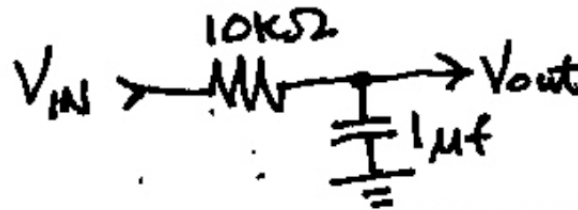What is the gain (=Vout/Vin) of this op-amp circuit?

[   ]

Question 16 1 pts

This circuit is what kind of filter?

○ lowpass

○ highpass

○ bandpass

○ notch

Question 17 1 pts

Same circuit as previous question, the corner frequency is **(in Hz)**:

[   ]

Question 18 1 pts

Inductors have impedance Z = jwL. What are the <u>units</u> of Z?

○ Henrys

○ Admittance

○

Ohms

○

Mhos

⋮⋮

Question 19 1 pts

A BJT is best described as a

○

Current controlled current device

○

Current controlled voltage device

○

Voltage controlled current device

○

Voltage controlled voltage device

⋮⋮

Question 20 1 pts

Computers, made from analog transistors that exhibit continuous ranges of voltages, only display two binary states because:

○

they use special 2-state transistors

○

binary states are represented by "off" and "saturated"

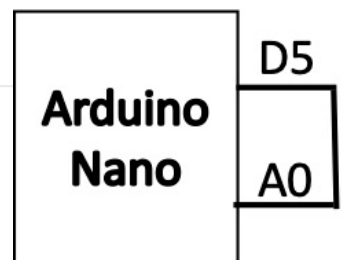○

a clock determines when the states are valid

○

both B and C

⋮⋮

Question 21 1 pts

The Arduino in the figure is running the following code. What will be the serial output?

```
analogWrite(5, 50);
...
Serial.println(analogRead(A0));
```
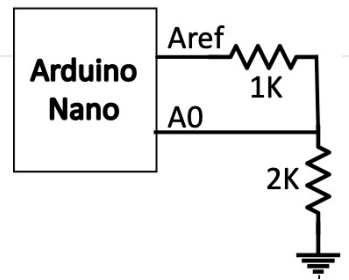
○
50

○
200

○
1023

○
0

○
sometimes 0 and sometimes 1023

⠿

Question 22 1 pts

The Arduino in the figure is running the following code. What will be the serial output?

```
Serial.println(analogRead(A0));
```

○
3.3

○
5

○
512

○
682

○
1023

⠿

Question 23 1 pts

The open-loop gain of a typical op-amp is on the order of

○
1e-3

○
1

○
1000

○
1e6

⠿

Question 24   1 pts

Negative feedback in an amplifier

○
Reduces the voltage gain

○
Increases the voltage gain

○
Doesn't affect the voltage gain

○
Converts the amplifier into an oscillator

Quiz saved at 8:57pm   Submit Quiz