

Circuits with Capacitors Test Review (A and B)

⚠ This is a preview of the draft version of the quiz

Started: Aug 22 at 7:44pm

Quiz Instructions

Question 1

1 pts

In a circuit, a 25 Ohm resistor and a 50 Ohm resistor are connected in series to a 16 V battery. After the switch is closed, what is the electric potential difference in the 25 Ohm resistor in Volts?

Question 2

1 pts

A battery with an emf of 16 V has an internal resistance of 4 Ohms. What is the current in Amps through the battery when it is connected to an external resistance of 20 Ohms?

Question 3

1 pts

A battery with an emf of 16 V delivers 12 V to an external circuit when the current in the circuit is 2 A. What is the internal resistance of the battery in Ohms?

Question 4**1 pts**

Which of the following statements is true of all combinations of resistors arranged in parallel?

- Both the current and the potential difference are the same in each branch.
- The total resistance increases as more resistors are added in parallel.
- The potential difference across each branch of the combination is the same.
- The current splits so that each resistor has the same current.

Question 5**1 pts**

Which of the following statements is true regarding the electrical conductivity of a wire?

- All of the above
- The electrical conductivity of a wire is proportional to the length of the wire.
- When an electric potential difference is applied across the metal, the resulting electric field causes electrons to move from one end of the wire to the other.
- Increasing the cross-sectional area of a wire increases the resistance to movement of electrons in the wire, so the conductivity decreases.

Question 6**1 pts**

A parallel plate capacitor stores 200 micro Joules of energy when charged to an electric potential difference of 10 V. If the capacitor is charged again to a potential difference of only 8 V, what will be the energy stored in the same capacitor in micro Joules?

Round to the 4th decimal place.

Question 7**1 pts**

A 2,000 micro Farad capacitor is charged to 100 V. What is the energy stored in the capacitor in Joules?

Question 8**1 pts**

A 2,000 micro Farad capacitor is charged to 10 V. Without removing any of the charges or changing the plate area or dielectric, the plates are moved apart so that there is twice the distance between them as before. What happens to the energy stored in the capacitor?

- The capacitance increases when the distance between plates increases, so the potential difference between the plates also increases and the energy in the capacitor increases.
- Negative work is done in moving the plates apart, so the energy stored in the capacitor decreases.
- The capacitance decreases when the distance between the plates increases, so the energy stored in the capacitor decreases.
- Positive work is done in moving the plates apart, so the energy stored

Question 9**1 pts**

A capacitor is charged to a potential difference of 20 V. Compare the energy stored in the same capacitor if it is charged to 40 V.

- There is twice as much energy at 40 V.
- There is one half as much energy ac 40 V.
- There is four times as much energy at 40 V.
- The energy is the same in both cases.

Question 10**1 pts**

When a net charge of 5.6 micro coulombs moves past a given point in 12 ms, what is the electric current in Amps?

Round the to the 4th decimal place.

Question 11**1 pts**

A 3,000 micro Farad capacitor and a 5,000 micro Farad capacitor are connected in series in a circuit with a 200 V battery. What is the equivalent capacitance of the two capacitors in micro Farads?

Question 12**1 pts**

A 3,000 micro Farad capacitor and a 5,000 micro Farad capacitor are connected in parallel in a circuit with a 200 V battery. What is the equivalent capacitance of the two capacitors in micro Farads?

Question 13**1 pts**

In which of the following actions is the most average power required?

- burning a light bulb that has a resistance of 10 Ohms using 2 A
- pushing a block across a level surface with a net force of 10 N at a velocity of 3 m/s
- changing the kinetic energy of a rolling wheel from 15 J to 55 J in 20 s
- lifting a 5 kg block to a height of 2 m in 2 s

Question 14**1 pts**

A 16 V battery is connected to a 8 Ohm resistor in a simple series circuit. What is the power dissipated as heat by the resistor in Watts?

Question 15**1 pts**

For an ohmic conductor, tripling the voltage without changing the resistance will cause the current to

- increase by a factor of 9

- decrease by a factor of 9
- increase by a factor of 3
- decrease by a factor of 3

Question 16**1 pts**

Keeping all else the same, adding a dielectric to a capacitor will always increase the capacitance.

- True
- False

Question 17**1 pts**

A student wants to determine the resistivity of copper. She has a voltmeter reading for a copper wire of known length. What other information will she need?

- An ammeter reading
- Both an ammeter reading and the diameter of the wire
- Neither an ammeter reading nor the diameter of the wire
- The diameter of the wire

Question 18**1 pts**

A simple DC circuit with a single Ohmic resistor is setup. A graph is produced of the voltage drop across the resistor versus current. For an ideal battery, the graph is

directly proportional. If the battery has some internal resistance, how, if at all, would such a graph change?

- The graph would be nonlinear.
- The graph would remain directly proportional.
- The graph would be linear, but would have a positive y-intercept.
- The graph would be linear, but would have a negative y-intercept.

Question 19**1 pts**

How much energy in Joules is dissipated as heat in 30 s by a 150 Ohm resistor that carries a current of 4.5 A?

Question 20**1 pts**

How many electrons are moving through a current of 4 A for 3 s?

____ x 10¹⁶ electrons

Fill in the blank

Question 21**1 pts**

How much electrical energy in Joules is generated by a 50-W light bulb turned on for 6 min?

Question 22**1 pts**

What is the Amps of current in a 15-Ohm resistor due to a potential difference of 200 V?

Question 23**1 pts**

A 200 Ohm resistor has 100 A of current in it. The power generated is _____ Watts.

Question 24**1 pts**

A 5 Ohm and a 10 Ohm resistor are connected in series with one source of emf of negligible internal resistance. If the energy produced in the 5 Ohm resistor is X, then the energy produced in the 10 Ohm resistor is

2 X

X/4

X/2

X

Question 25**1 pts**

A student wants to determine the resistivity of a conductor experimentally. The student needs to collect data in order to do this. The data taken should be the

- potential difference across ends of the conductor and its length
- type of material, the length of the conductor, and its cross-sectional area
- potential difference across the ends of the conductor, the current flowing through it, and the length and cross section the conductor
- potential difference across the ends of the conductor and the current flowing through it

Question 26**1 pts**

The best way to prepare for the test is to review the bellworks.

- True
- False

Not saved

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