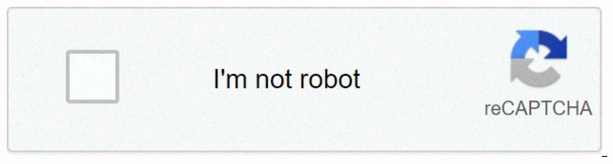

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Pltw activity 1.2.3 electrical circuits simulation answers

Introduction Since the late 1800s, engineers have designed systems to use electrical energy due to the ability to efficiently convert, store, transmit and re-convert to other forms of energy. In the 21st century, electrical energy generation, distribution, and application have become consumer-driven. Today's consumer uses electrical energy in all aspects of life, from cell phones and computers to refrigeration and heating and cooling systems, and even to transportation. Electrical energy, depending on geographical location, is converted from mechanical energy, chemical energy, light energy, and thermo energy before it reaches the consumer. Despite the conversion process, electrical energy consists of three basic components: current, voltage and resistance. The current time is the net transfer of electric charge per unit. Voltage is the amount of work required to move a charge from one point to another. Resistance is opposed to the flow of the stream. Understanding the relationship between current, voltage and resistance allows engineers to design efficient, safe and functional electrical circuits. The electrical circuit consists of the following components: an energy source to provide voltage, conductor to allow current travel, insulator to limit current travel, and a load. Electrical circuits provide a seamless path to current travel and are broken down into two different categories of design: series circuits and parallel circuits. Conclusion Question1. Explain the primary difference between a series and a parallel circuit. A chain circuit acts like a straight line, or has a domino effect. If a bulb is to be removed, all other bulbs will go out. In a parallel circuit, a bulb can be removed because the power source of the circuit can go through multiple wires to reach several different bulbs, destroying the domino effect of a chain circuit. Explain the difference between voltage output on the battery and the voltage in each bulb in the series circuit. Whatever the voltage of the battery, it is going to be 100%. The voltage across each bulb in a series circuit will be the same across each bulb, but the current flow will be affected based on any OHM that may be current. 3 । In a chain circuit, explain the relationship between the current on the battery and each bulb in the circuit. The current on the battery will be combined with a total of individual currents of different bulbs of the entire circuit, while the current bulb on each bulb in the circuit will vary depending on any ohm present before the bulb or present in the bulb. 4. Explain the relationship between the voltage on the battery and the voltage across each bulb in a parallel circuit. The voltage on the battery will total the voltage of the battery. Each bulb will have the same voltage individually and its current will be affected by any Before bulb.5. Explain the relationship between the battery and the current currently through each bulb in the parallel circuit. The current on the battery will total all the streams of bulbs that are turned on. The bulbs' current will be dependent on each volt individually divided by the resistance of the bulb and/or any resistance which comes shortly before the volt bulb will reach. 6 । For combination circuits, explain the relationship between voltage output on the interface and voltage in two light bulbs. The voltage on the output is going to be 100% of the battery voltage and the voltage on the two light bulbs will also be the same. For combination circuits, explain the relationship between the battery and the current output currently through each bulb in the parallel circuit. The current output on the battery will stream the entire circuit, while each bulb will sum up to equal to the total current in the current circuit through. Embed Size (PX) 344 x 292429 x 357514 x 422599 x 42257Activity 1.2.3 Electrical Circuit Simulation Electrical Circuit Simulation Since the late 1800s, engineers have designed systems to use electrical energy efficiently, due to the ability to convert, store, transmit and re-convert electrical energy. In the 21st century, electrical energy generation, distribution, and application have become consumer-driven. Todays uses electrical energy in all aspects of consumer life, from cell phones and computers to refrigeration and heating and cooling systems, and even to transportation. Electrical energy, depending on geographical location, is converted from mechanical energy, chemical energy, light energy, and thermo energy before it reaches the consumer. Despite the conversion process, electrical energy consists of three basic components: current, voltage and resistance. The current time is the net transfer of electric charge per unit. Voltage is the amount of work required to move a charge from one point to another. Resistance is opposed to the flow of the stream. Understanding the relationship between current, voltage and resistance allows engineers to design efficient, safe and functional electrical circuits. The electrical circuit consists of the following components: an energy source to provide voltage, conductor to allow current travel, insulator to limit current travel, and a load. Electrical circuits provide a seamless path to current travel and are broken down into two different categories of design: series circuits and parallel circuits. Equipment Project Lead Way, Inc. Copyright 2011POE Unit 1 Lesson 1.2 Activity 1.2.3 Electrical Circuit Simulation Page 1Engineering NotebookCulator with THE Internet (Simulation Courtesy: PhET Interactive Colorado activity will provide you with the introduction of voltage, current, resistance, chain circuit, parallel circuit and OMS law. Your team will build circuits using online power simulator. You will use a virtual multimeter to measure properties within the circuit. Introduction of electric circuits Electric circuit schematics are diagrams consisting of symbol representations and configuration of electrical components within a circuit. The table below shows the circuit symbols used within the plan in this lab. ComponentSymbolPictorialPower Supply (Battery) Conductive Virristoopen SwitchClose SwitchClose (Voltage Reading) VAmmeter (Current Reading) IOhms LawThe current, the relationship between voltage, and resistance within an electrical circuit was developed by George Simon Om and today known as ohms law. Oms Law states that the direct current flowing into the electric circuit is directly proportional to the voltage applied to the circuit. In other words, an electric circuit represents the flow of electrons along a conductive path between two points. This flow of electrons is called current. What is the reason for transferring electrons? An inspiration, or voltage, causes electrons to flow. Voltage refers to the potential difference, or the amount of work to be done with an electrical circuit carrying a charge from one point to another. While electrons constantly flow along a given circuit, opposition to their movement is referred to as resistance. It is important to understand the mathematical equation for the OMS law. Use the OMS Law table provided to work through activity practice problems and laboratory calculations. Prepare oms lockvensreverivevalues unit symbolsprectic enumeration circuits in a planned manner. Identify known and unknown values for each circuit. Provide the appropriate unit for each measurement. Show all steps for each calculation. On a camping trip, you decide to use a cordless air pump to inflate an inflatable mattress. If the air pump is powered by a 9 volt battery with resistance of 18 ohm, what is the amount of current flowing through the circuit? Circuit SchemacalationsA DJ uses a 110 volt outlet to plug in a strobe light. If the current flowing through the light is 0.050 amps, how much resistance is there within the circuit? Circuit schematic calculations automatically found the MP3 player you've wanted for months. When you're waiting in the check-out line, you read the back of the packaging. The manufacturer has guaranteed that the player will perform consistently with a resistance of 40 ohm and a current of 0.1 amps. What is the voltage for mp3 player? Circuit Schemacalations Conctructing Circuitsor team will build a series and parallel circuit using the steps below. Creating a Circuit1. Launch Circuit Kit from the University of Colorado in Boulder: A battery from the circuit palate on the right. R-click on the battery and set the voltage to 9 volts. Build the circuit displayed below using the default bulb and a switch in the open position. Note that your circuit will not look like the image below. You are to explain the schematic diagram to create a circuit. Check the voltage throughout the light bulb. Record the measurements in the location below. Note: Measuring voltage when getting a positive or negative value is dependent on the direction of polarity or flow. In other words, 4.5V and -4.5V can be taken from the same source depending on the placement of the lead. The voltage switch _____VClose across the bulb so the bulb keeps conduction. Get voltage measurements in bulbs and power supplies. Record the measurements in the location below. The bulbs supply the current through the light bulb by adding _____VPower _____VCheck ammeter. Record the measurements in the location below. Present _____A2. Use the voltage (V) and current to determine the resistance of the bulb that you have already set for this circuit current (I). Show your work and include units. Formula: Substitute Value: Solve: Resistance = _____Creating Series Circuit Use the image below to create a series circuit. The switch _____AVoltage current in the battery _____VVoltage across the #1 _____V voltage in #2 _____VClose bulb. Record new readings for circuits. The bulb #2 _____VAdd an ammeter between the current _____AVoltage bulbs across the voltage _____VVoltage battery across #1 _____V bulbs and record the current. Current between bulb _____A3. Use the voltage (V) and current to determine the resistance of the bulbs in the series that you have already set for this series circuit current (I). Show your work and include units. Formula: Substitute Value: Solution: Resistance = a Parallel Circuit4 _____Creating. Create the circuit shown below with switch open. Confirm that: Bulb 1 is on and bulb 2 is off. Switch off and record the following data. 1 What happened to the brightness of the bulb? _____Which bulb brighter? The bulb on the bulb _____AAdd one voltmeter for the _____Current #2 _____ACurrent total circuit on #1 _____ACurrent. Record the voltage in each light and the output source in the space provided below. The bulb #1 _____VBulb #2 _____VOutput on the battery _____V5. Calculate the total resistance for the circuit (show all the work): Formula: Officiating and Solution: RT_____ making the circuit a combination circuit as shown below. #1 bulb must still be turned on, current meter should The same measurement in phase 8, and the bulb should #2 and close #3. Turn off the switch button and notice what happens to the first light. Look at the image below and record the new current measurement in the space provided below the image. Bulbs in #2 #1 _____ACurrent bulbs and current _____A at conclusion1 the bulbs in the #2 _____VVoltage #1 _____ACurrent #3 _____VCurrent #1 _____V bulbs across the #1 _____V voltage across the battery across the _____VVoltage #3 _____ATotal battery across the bulb. Explain the primary difference between a series and a parallel circuit. 7 । Explain the difference between voltage output on the battery and the voltage in each bulb in the series circuit. 8. In a series circuit, explain the relationship between the current on the battery and each bulb in the circuit. 9. Explain the relationship between the voltage on the battery and the voltage across each bulb in a parallel circuit. 10. Explain the relationship between the battery and currently currently present through each bulb in the parallel circuit. 11. For combination circuits, explain the relationship between voltage output on the interface and voltage in two light bulbs. 12. For combination circuits, explain the relationship between current output a