

# CHAPTER REVIEW ELECTRICITY

## CIRCUITS ANSWERS

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**Is the result of electrons colliding with atoms as current flows in a material?**

The atoms of the filament would vibrate from the collision (Joule heating). Some of this energy of vibration would go towards making light. Most would be lost as heat transfer to the surroundings. Electrons colliding with atoms amounts to a resistance to their passage through a material.

**What is a commonly used unit for electrical energy?** A commonly used unit of electrical energy is the kilowatt-hour. This is the energy produced by 1000 watts in a period of one hour.

**What is charging a balloon by rubbing it on wool is an example of?** Static Electricity: Unlike an electrical current, static electricity is the build up of charges that stay in one place. Static electricity is the reason that a balloon rubbed on your hair makes it stand on end, or the reason you might get shocked when touching a door knob.

**What is the purpose of most electric circuits?** Introduction. An electric circuit is a path for the transmission of electric current. When electric current moves through a circuit, electrical energy in the current is transferred to devices that change it into other forms of energy that can do work, such as providing power to lights, appliances, and other devices.

**Do electrons flow or vibrate?** When bound in a stable state in an atom, an electron behaves mostly like an oscillating three-dimensional wave, i.e. the orbital vibrates. It's a bit like a vibrating guitar string.

**Do electrons move when current flows?** Electric current (electricity) is a flow or movement of electrical charge. The electricity that is conducted through copper wires in your home consists of moving electrons.

**What direction does current flow?** Current flows from positive to negative and electron flows from negative to positive. Current is determined by the number of electrons passing through a cross-section of a conductor in one second. Current is measured in amperes, which is abbreviated "amps". The symbol for amps is a letter "A".

**What is the symbol for voltage?** The volt (symbol: V) is the unit of electric potential, electric potential difference (voltage), and electromotive force in the International System of Units (SI).

**What is the smallest unit of energy?** An energy unit that is used in atomic physics, particle physics, and high energy physics is the electronvolt (eV). One eV is equivalent to  $1 \text{ eV} = 1.602 \times 10^{-19} \text{ J}$ . Therefore, the smallest unit of energy is "eV".

**Is hair positively or negatively charged?** Untreated human hair has a strongly negative surface charge. Carboxyl groups of glutamine and aspartic acid and sulfonic acid groups in the hair are responsible for this property. If a hair is treated with shampoo, conditioner, dye, or bleach, the charge of the hair surface changes.

**Are electrons positive or negative?** Electrons have a negative charge. The charge on the proton and electron are exactly the same size but opposite. Neutrons have no charge. Since opposite charges attract, protons and electrons attract each other.

**What is the smallest electric charge that can be put on an object?** Answer and Explanation: The smallest unit of electric charge that scientists have isolated is the charge of an electron. The elementary charge of an electron equals to  $1.609 \times 10^{-19}$  Coulomb-volt. This has been given the unit name of electron-volt (eV) and is the smallest unit of electrical charge.

**What does P mean in electrical terms?** P is the electric power in watt (W). V is the voltage in volts (V). I is the current in amps (A). R is the resistance in ohms ( $\Omega$ ).

**What is the most important wire in a circuit?** Hot Wire. Hot wire is used as the initial power feed to a circuit. It carries the current from the power source to the outlet. Acting as the first instance of a circuit, they are always carrying electricity, meaning it is dangerous to touch a hot wire while there is a power source feeding it.

**Which two parts must all electric circuits contain?** Parts of an Electric Circuit All electric circuits have at least two parts: a voltage source and a conductor. They may have other parts as well, such as light bulbs and switches, as in the simple circuit seen in the Figure below.

**Is electricity faster than light?** So the answer to the question would be the speed of light is faster. Light travels through empty space at 186,000 miles per second. The electricity which flows through the wires in your homes and appliances travels much slower: only about 1/100 th the speed of light.

**Why do the lights in your home come on almost instantaneously?** The charge that constitutes the current is already present in all parts of the circuit and, as soon as the circuit is completed, the charged particles start flowing and energy is shifted by the bulb.

**Does an atom have a color?** atoms (as opposed to molecules) do not have colors - they are clear except under special conditions.. you could not see the color of one atom or molecule - not because it is too small - but because the color of one atom would be too faint.

**What is electricity made of?** Sometimes, the electrons in an atom's outermost shells do not have a strong force of attraction to the protons. These electrons can be pushed out of their orbits. Applying a force can make them shift from one atom to another. These shifting electrons are electricity.

**Where do electrons come from in electricity?** Whenever a battery is connected in a closed circuit, a chemical reaction inside the battery produces electrons. The electrons produced in this reaction collect on the negative terminal of the battery. Next, electrons move from the negative terminal, through the circuit, and back to the positive battery terminal.

**Do we really know what electricity is?** One of electromagnetism's key tenets is that the subatomic particles that make up the cosmos can have either a positive or negative charge. To use them as a form of energy, we have to make them flow as electric current. The electricity we have on Earth is mostly from the movement of negatively charged electrons.

**What is the flow of electrons between atoms called?** Electricity is a word used to describe the directional flow of electrons between atoms. The directional movement of electrons between atoms is called electrical current.

**What is the flow of electrons through a material called?** Electric current is the flow of electrons through a material.

**What is the flow of electrons from one atom to another in a conductive material?** Electric current is flow of electrons in a conductor. The force required to make current flow through a conductor is called voltage and potential is the other term of voltage. For example, the first element has more positive charges, so it has higher potential.

**Are electrons responsible for current in a material?** Free electrons are responsible for current in the conductors. Free electrons are valance shell electrons having a weaker force of attraction between them and nucleus and so they are free to move in the metal conducting current in the metal (conductor).

**What is IBM SPSS Modeler used for?** IBM® SPSS® Modeler is a set of data mining tools that enable you to quickly develop predictive models using business expertise and deploy them into business operations to improve decision making.

**What is the difference between SPSS statistics and SPSS Modeler?** Modeler is more appropriate for analysts that want to develop re-usable analytical applications (like fraud detection) whereas SPSS Statistics is often used to analyse new data files as and when they appear.

**Is IBM SPSS cloud based?** IBM SPSS Modeler is available on IBM Cloud Pak for Data. Take advantage of IBM SPSS Modeler on the public cloud. Manage analytical assets, automate processes and share results more efficiently and securely. Get descriptive and predictive analytics, data preparation and real-time scoring.

**What is IBM SPSS Modeler trial?** IBM SPSS Modeler is a leading visual data science and machine learning (ML) solution designed to help enterprises accelerate time to value by speeding up operational tasks for data scientists.

**What are the 4 reasons why IBM SPSS should be used?**

**What is the main purpose of SPSS?** SPSS (Statistical Package for the Social Sciences), also known as IBM SPSS Statistics, is a software package used for the analysis of statistical data. Although the name of SPSS reflects its original use in the field of social sciences, its use has since expanded into other data markets.

**Is it better to use SPSS or Excel?** Much more sophisticated data visualisation in SPSS Excel includes some basic charting options but SPSS's data visualisation capabilities are far superior. With SPSS, you can create a huge range of visually appealing and informative charts, graphs, and plots that help you present your findings more effectively.

**When should we use SPSS?** SPSS is used by market researchers, health researchers, survey companies, government entities, education researchers, marketing organizations, data miners, and many more for processing and analyzing survey data, such as you collect with an online survey platform like Alchemer.

**What are the data types in SPSS Modeler?**

**Is SPSS still relevant?** With its powerful analytical capabilities, user-friendly interface, and wide-ranging applications, SPSS is likely to remain a valuable skill in the future. As industries continue to rely on data-driven decision-making, professionals proficient in SPSS can expect a bright scope ahead.

**Is SPSS easy to learn?** Learning SPSS. SPSS's interface resembles that of Excel spreadsheets, which makes it easy to learn. If you have never come across SPSS before, it will be helpful to have previously worked with a spreadsheet program, such as OpenOffice or MS Excel.

**How to use SPSS in Excel?** From the menu, choose File > Import Data > Excel, the dialog box "Open Data" will pop up. Locate and select the Excel file, then click Open. You can also drag and drop an existing file directly into an open SPSS window.

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**What is the SPSS called now?** Versions of the software released since 2015 have the brand name IBM SPSS Statistics. The software name originally stood for Statistical Package for the Social Sciences (SPSS), reflecting the original market, then later changed to Statistical Product and Service Solutions.

**How to use IBM SPSS Modeler for data analysis?**

**Do companies use IBM SPSS?** Organizations utilize IBM SPSS Statistics to understand data, analyze trends, forecast, and plan to validate assumptions and drive accurate conclusions.

**Is SPSS qualitative or quantitative?** Statistical analysis software, such as SPSS, is often used to analyze quantitative data. Qualitative data describes qualities or characteristics. It is collected using questionnaires, interviews, or observation, and frequently appears in narrative form.

**What does SPSS stand for in IBM?** SPSS (Statistical Package for the Social Sciences) is a software program used by researchers in various disciplines for quantitative analysis of complex data.

**What are the two types of SPSS?** There are two types of ways to view data in SPSS and these can be changed using the “Data View” and “Variable View” tabs on the very bottom left of the window.

**What are the disadvantages of SPSS?** SPSS constraints include difficulties with data preprocessing, Bayesian analysis, and complex surveys. R's extension packages handle these tasks well, making R a more versatile choice for data analysis.

**What are the three main components of SPSS with examples?**

**What is the basic understanding of SPSS?** SPSS is a Windows based program that can be used to perform data entry and analysis and to create tables and graphs. SPSS is capable of handling large amounts of data and can perform all of the analyses covered in the text and much more.

**How to use IBM SPSS Modeler for data analysis?**

### **What is the function of SPSS in IBM?**

**What is the difference between Excel and IBM SPSS?** Excel is spreadsheet software, SPSS is statistical analysis software. In SPSS every column is one variable, Excel do not treat columns and rows on that way (in treating volume and rows SPSS is more similar to Access than to Excel).

**Do people still use IBM SPSS?** SPSS is a widely used program for statistical analysis in social science. It is also used by market researchers, health researchers, survey companies, government, education researchers, industries, marketing organizations, data miners, and others.

**What is the electrical wiring diagram?** A wiring diagram represents the conductors and components that make up an electrical circuit or system. Some wiring diagrams simply show how electricity flows through the circuit, while others show how each connection must be made for the circuit to work.

### **What are the four types of wiring diagrams?**

### **What are the color codes for electrical wires?**

**What do the colors of the wiring diagram mean?** Knowing Wire Colors Can Really Save Time Green wires are typically for grounding. Black wires are used for power. Red wires deliver a secondary live wire in a 200-volt circuit. White/gray wires are used as neutrals (but can still carry a charge). Bare copper wires are used for grounding to metal.

**What is the electrical schematic diagram?** A schematic diagram is a fundamental two-dimensional circuit representation showing the functionality and connectivity between different electrical components. It is vital for a PCB designer to get familiarized with the schematic symbols that represent the components on a schematic diagram.

### **What are the 4 rules of wiring?**

**What is an electrical wiring plan?** What is an electrical plan? It is the visual and drawn description of our buildings circuits and electrical properties, also known as

wiring diagram or electrical drawing. It includes lines. and symbols in a layout that represents the electrical system of the property, usually designed by an electrical engineer.

**Which color wires go together?** If the voltage for the device is compatible you connect the white wire to the blue wire, the black wire to the brown wire, and the green wire to the green/yellow wire. That's it, you're ready to power it up. Look at the bottom three rows for single-phase wire color codes.

**How do I identify electrical wires?**

**Can red and black wires go together?** That explains things. The black and red wire are not a suitable wire for what was done (perhaps they are speaker wire or low voltage 12v battery wire). You should seriously consider having that replaced as this is a potential fire hazard. As for the connection you are asking about.

**What is the color code for the live wire?** Wiring Colour Codes The blue wire also referred to as the neutral wire, has the function of transferring electricity away from the appliance. The brown wire, otherwise known as the live wire, transfers electricity to the appliance.

**How to connect green, white, and black wires?** Connect the white wires (neutral wires) from your fan and ceiling together. Connect the green wire to your household ground wire (copper/bare wire). Connect the black wires together.

**What is the color code for single phase wiring?** Single Phase AC supply: The preferred wiring color codes for single phase systems are as follows: Phase or Line(L) = Black or Red. Neutral (N) = White. Protective Earth (PE) conductor = Green.

**How do you read a house wiring diagram?** Straight lines represent wires, the wires are used to connect different peripherals in a circuit. This may include bulbs, switches, etc. A triangle represents ground or service, it indicates the area of operation for a circuit. A zigzag diagram represents resistors.

**What color is live wire?** The live wire is Brown This replaces the old colours of red (live) and black (neutral) and green (earth) which changed back in 2006. If your plug has these colour wires, we recommend that you replace it.



**How to read an electrical circuit diagram?** Follow the Flow: Electrical schematics are typically read from left to right, with the power source on the left and the ground on the right. Follow the flow of the lines to understand how current travels through the circuit. Identify Components: Identify each component in the schematic and understand its function.

**How to draw up a wiring diagram?**

**What basic knowledge do you need to be an electrical lineman?** Becoming an electrical lineman requires technical instruction plus on-the-job training. A high school diploma or equivalent is the starting point. Most employers require a basic knowledge of algebra and trigonometry.

**Do lineman have to be good at math?** Algebra: Line workers will use algebra the most in their daily work. This type of math will help line workers calculate basic measurements when it comes to tool and equipment selections. Geometry: Properly setting up power lines requires at least a working understanding of calculating angles.

**What does a lineman do electric?** Installing, maintaining, and repairing electrical power lines. Inspecting and testing other equipment, such as conductors, voltage regulators, and switches. Climbing poles and transmission towers or using truck-mounted buckets. Stringing power lines between poles.

**What is the job description of a lineman?** An electric utility lineman installs, maintains, and repairs electrical distribution and transmission systems. This includes conduits, cables, wires, and related equipment such as transformers, circuit breakers, and switches. He or she also digs holes, using augers, and sets poles, using cranes and power equipment.

**How can I be a good lineman?**

**What soft skills do you need to be a lineman?** Here are some soft skills that lineworkers can use in their careers: Critical thinking: Lineworkers can work with electricity in dangerous conditions like rain or snow. Critical thinking can prevent accidents during these situations. Time management : Deadlines are common in the lineworker profession.

**Why is being a lineman so hard?** Working on the line means hauling gear, pulling thick cable and wire, and not minding having to work long hours day or night. Every day is different, from challenging jobsites to working in all types of extreme weather. And working with high-voltage lines leaves you absolutely no room for error.

**What is the hardest part about being a lineman?** The Hardest Part About Being a Lineman Yes, the job requires physical strength, but the mental grit required to maintain intense focus, make split-second decisions, and work for hours on end in punishing conditions is what separates the men from the boys.

**Can I be an electrician if I'm bad at math?** Yes, Electricians need math skills as part of their job. They use mathematics to calculate electrical loads, measure voltage, current, and resistance, determine wire and conduit sizes, and ensure that electrical systems are safe and comply with building codes.

**What is the highest paid type of lineman?**

**Why do linemen get paid so much?** Storm Work Impacts the Pay of Lineman Jobs Storm work for lineman is high paying for lineman jobs for several reasons: Utilities companies are in high demand as their customers are without power. Hourly pay is increased for both overtime work as well as travel time in some circumstances.

**Is it better to be a lineman or electrician?** Linemen work outside with high voltage transmission lines and systems. Electricians work in commercial and residential settings, mostly indoors, and with lower voltage systems. If you like to work outdoors, becoming a lineman might be a good career choice. But do keep in mind that the work is physically demanding.

**Is lineman a growing job?** Lineman and Powerline Statistics There are around 120,376 linemen working the US grid at the moment with the career rate growing 2.94% each year.

**What does a lineman do everyday?** Installing transmission and distribution lines between power plants and individual buildings or homes. Reading and interpreting electrical wiring diagrams. Digging trenches or climbing poles to repair or maintain underground and overhead electrical cables.

**What should a lineman resume look like?** A successful resume sample for Linemen should emphasize electricity knowledge, attention to safety, dexterity, the ability to work in difficult conditions, teamwork, time management, and good communication skills. Eligible resumes make display of a diploma from a technical school.

**What are the qualities of an electrical lineman?**

**What are the stages of becoming a lineman?**

**What does a lineman do on a daily basis?** Lineman responsibilities include: Installing transmission and distribution lines between power plants and individual buildings or homes. Reading and interpreting electrical wiring diagrams. Digging trenches or climbing poles to repair or maintain underground and overhead electrical cables.

**How do I prepare for a lineman interview?** The best way to prepare for a lineman interview is to have two key sections committed to memory: overview of work experience and examples of qualification. Overview of work experience means you can succinctly summarize how your past experience on your resume (in the line industry or not) translate to this opportunity.

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