

# CHAPTER 20 STATIC ELECTRICITY

## ANSWERS GOKARTORE

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**How to charge a conductor negatively if you have only a positively charged rod?** Bring the conductor close to, but not touching, the rod. Ground the conductor in the presence of the charged rod; then, remove the ground before removing the charged rod. The conductor will have a net negative charge.

**Why does the CD then attract dust if you wipe a compact disc with a clean cloth?** Compact Discs If you wipe a compact disc with a clean cloth, why does the CD then attract dust? SOLUTION: Rubbing the CD charges it. Neutral particles, such as dust, are attracted to a charged object.

**When a comb is rubbed on a wool sweater it is able to pick up small pieces of paper?** Charged Objects After a comb is rubbed on a wool sweater, it is able to pick up small pieces of paper. Why does the comb lose that ability after a few minutes? The comb loses its charge to its surroundings and becomes neutral once again.

**What happens when charged materials get close to one another?** If two objects have different charges, they attract (or pull towards) each other. If two objects have the same charge, they repel (or push away) from each other.

**Which conductor is both positive and negative?** Expert-Verified Answer. In conductors and insulators, both positive and negative charges can move.

**Is Rod positively or negatively charged?** The plastic rod becomes negatively charged because the plastic possesses a more significant attraction for electrons than the cloth. The glass rod becomes positively charged because the cloth possesses a more significant attraction for electrons than the glass rod.

**Can dust ruin CDs?** Dirt or dust on the disc will block or reduce the light intensity of the laser. If severe enough, it will cause the disc drive to miss data as the disc is being read. Fingerprints, smudges, or dirt cover wide areas of data and will cause the laser beam to go out of focus or lose intensity.

**Why does toothpaste clean CDs?** Fortunately, scratches are more common on the reflected side, and that's where toothpaste comes in handy. The laser that reads the CD needs to bounce evenly off the smooth, reflective surface. Toothpaste is just abrasive enough to wear down scratched areas to a smoother surface.

**How do I clean my CD player?** Use a handheld air bulb to gently blow dust away. Avoid using compressed air - this can damage your drive. Try gently cleaning the lens of the CD player if removing dust doesn't work. However, be aware that this can void your player's warranty.

**How are electrostatic force and charge related?** RELATION BETWEEN ELECTRICAL FORCE AND ELECTRICAL CHARGE The quantity of electrostatic force among stationary charges is described by Coulomb's law. The electrostatic interaction force is inversely proportional to the square distance between the two charges and directly proportional to the point charges themselves.

**What are the two types of electric charge called?** There are two types of electrical charge: positive and negative electric charges. If an object is positively charged, it is electron deficient. If an object is negatively charged, it has an excess of electrons.

**When rubbing a plastic comb with dry hair it acquires some charges and it attracts tiny pieces of paper?** Comb gets electrically charged by friction when even through dry hair. It attracts small bits of paper because paper gets polarized in the presence of charged comb resulting in a net force of attraction. When hair is wet, the friction between comb and hair decreases and comb does not get charged.

**How do neutral charges interact?** Any charged object - whether positively charged or negatively charged - will have an attractive interaction with a neutral object. Positively charged objects and neutral objects attract each other; and negatively charged objects and neutral objects attract each other.

**What happens when a negatively charged rod touches an electroscope?**

Answer and Explanation: When a negatively charged object touches an electroscope it will transfer some of its excess electrons to the electroscope and thereby give the electroscope a negative charge. This means that the negatively charged object will now be repelled from the electroscope.

**What happens when you rub a balloon on your hair?** Rubbing the balloon onto your hair or onto the wool fabric adds electrons to the balloon and causes the balloon to become negatively charged. Like charges repel (the two balloons, once charged, will move away from each other) and opposite charges attract (the paper will be attracted to the charged balloons.)

**How does a charged rod attract a neutral object?** Therefore, when it is brought close to the neutral object, negative charges on the neutral object will move to the surface close to the positively charged object while the positive charges on it move to the surface furthest from this charged object. This will result in an attraction between the two objects.

**How is charge distributed on an insulator?** In an insulator, the charge cannot be redistributed. If we charge an insulator, the charge will remain only at the spot that we charged. Charging multiple areas on an insulator will result in all these areas being charged, though the space between them will not be charged.

**What does the resistance of a wire depend on?** Resistance of a wire depends upon: Length of wire: Resistance is directly proportional to the length of a wire. Area of a cross-section of wire: Resistance is inversely proportional to the area of cross-section the wire.

**How does charging by contact work?** In contrast to induction, where the charged object is brought near but never contacted to the object being charged, conduction charging involves making the physical connection of the charged object to the neutral object. Because charging by conduction involves contact, it is often called charging by contact.

**How do you charge an electroscope by contact?** Charging by contact. Rub an insulator to charge it up. Then stroke it across the top plate of the electroscope. This

will transfer charge from the insulator to the electroscope.

**Is a neutral conductor always at 0 potential?** Electrically neutral means net charge zero. Potential of a neutral conductor may or may not be zero. It depends upon the other charges present in the surrounding.

**How to clean a Blu-ray?** Dedicated CD and DVD wipes are also available which are already coated in a suitable cleaning solution. For Blu-ray discs a soft cloth can be used instead of the tissue because it has a much harder surface, and a very mild detergent can also be used if necessary.

**How to clean a DVD?**

**How to dry a CD?** Microfiber towels are great for drying delicate items like CDs, DVDs, and electronic components. Hand-drying is preferable to air-drying, as it's possible for water to leave spots on the surface of the disc if it's allowed to sit for too long.

**How to clean a scratched Wii disc?**

**How to clean a video game disc?** Dampen a clean, soft, cotton cloth with water. Use straight strokes and wipe the disc (non-labeled side) from the inside rim to the outside rim. Using a dry part of the cloth, repeat step 2 to dry the disc.

**How to polish a CD disc?** Start with a basic toothpaste, something natural without any fancy gels, swirls or flavors. Squeeze a small amount onto the CD starting at the middle radius and rub it in using a sweeping motion until the entire CD is covered in a light layer of toothpaste. Let it dry, then rinse it off using tepid water.

**How a conductor can be charged negatively?** The charging by induction process is where the charged particle is held near an uncharged conductive material that is grounded on a neutrally charged material. The charge flows between two objects and the uncharged conductive material develop a charge with opposite polarity.

**How do you charge a rod negatively?** Rub silk on a glass rod to create a positive charge on the rod. Rub fur on a plastic rod to charge the rod negatively.

**How do you charge a conductor negatively by conduction?** Charging by Conduction Using a Positively Charged Object. The previous example of charging by conduction involved touching a negatively charged object to a neutral object. Upon contact, electrons moved from the negatively charged object onto the neutral object. When finished, both objects were negatively charged.

**Can a positively charged conductor be at a negative potential?** Positively Charged Conductor at a Negative Potential In principle, a positively charged conductor can be at a negative potential. This can happen if, for example, there is a larger negatively charged object or a group of negatively charged objects nearby.

**Is a conductor always positive?** Both conductors and insulators have positive and negative charges, but conductors allow negative charge to flow but insulators don't, why?

**How can a conductor be charged positive?** If a positively charged object is brought near a conductor, electrons will be repelled from the conductor, leaving the conductor with a net positive charge. This is due to the attraction between the positive charge on the object and the negative charges in the conductor.

**What becomes negatively charged?** An object becomes negatively charged when it gains electrons. On the atomic scale, non-metals gain electrons to fill their outer electron orbitals. An anion is an atom that has more electrons than protons and is negatively charged.

**How does a gold leaf electroscope work?** A positively charged body is brought near the metal cap. Then an unknown body is brought near the metal cap. If the leaves diverge further, we can conclude that the unknown body has a positive charge. If the leaves come closer to each other, then the charge of the unknown body is negative.

**What does it mean when an object is polarized?** When an object becomes polarized, its center of positive charge becomes separated from its center of negative charge. Overall, there are just as many positive charges as negative charges; the object has a balance of charges and is therefore neutral.

**Why does a comb attract pieces of paper?** Initially, the comb is electrically neutral. So it has no effect on the tiny pieces of paper. When the comb is rubbed on a dry cloth, it gets electrically charged. This charged comb exerts an electric force on the tiny pieces of paper and attracts them.

**What are the facts about charging by contact?** Contact charging is a process where two objects come into direct contact with each other, resulting in a transfer of electric charge between them. One object gains electrons while the other loses electrons.

**What happens when a positive and neutral charge meet?** Flexi Says: If a positively charged body is brought near to a neutral or uncharged body, it induces a negative charge on the near side and a positive charge on the far side of the neutral object. This creates a force of attraction between the two bodies.

**How much positive charge is there in 250 gm water?**  
 $=250 \times 10^{-3} \times 6.02 \times 10^{23} \times 10 \times 1.6 \times 10^{-19} \text{ C} = 1.34 \times 10^7 \text{ C}$ .

**Can you get negative potential energy?** Reason : Potential energy is always negative and if it is greater than kinetic energy total mechanical energy will be negative.

**What happens when potential difference is negative?** A positive potential difference shows that an energy store is being emptied by the electrical working; a negative potential difference shows that an energy store is being filled by the electrical working.

**Can electric potential have a negative value?** If the two charges are of the same type (either positive or negative), the electric potential between them is positive. If the charges are of different types, the electric potential between them is negative.

### **Service Management Principles for Hospitality and Tourism: Q&A**

**Q: What are the key service management principles for hospitality and tourism?**

**A:** The fundamental principles include:

- **Excellence:** Striving to provide exceptional experiences that exceed guest expectations.
- **Customer Orientation:** Prioritizing customer satisfaction by understanding their needs and tailoring services accordingly.
- **Empowerment:** Giving employees the authority to make decisions that enhance the guest experience.
- **Personalization:** Offering customized services that cater to individual preferences.
- **Consistency:** Maintaining high standards of service delivery across all touchpoints.

**Q: How do these principles apply to the hospitality industry?**

**A:** In hospitality, these principles translate into actions such as:

- Providing a warm and welcoming environment, from the front desk to the dining room.
- Going the extra mile to fulfill requests and resolve any issues promptly.
- Empowering staff to make decisions that improve guest comfort and satisfaction.
- Personalizing services by remembering guest preferences and offering tailored recommendations.
- Ensuring consistent service quality through regular training and performance monitoring.

**Q: How can tourism businesses benefit from these principles?**

**A:** Tourism businesses can leverage these principles to:

- Offer memorable and authentic experiences that attract tourists.
- Provide excellent customer service throughout the travel journey, from information to bookings.
- Empower tour guides and other staff to create personalized itineraries and provide insightful commentary.

- Maintain high standards of safety, reliability, and accessibility.
- Collaborate with partners to ensure a seamless and enjoyable experience for tourists.

**Q: What are the challenges in implementing these principles?**

**A:** Common challenges include:

- Balancing personalization with efficiency
- Meeting the expectations of diverse customers
- Motivating and retaining staff in a competitive industry
- Aligning service standards across multiple touchpoints
- Measuring and evaluating the effectiveness of service initiatives

**Q: How can hospitality and tourism businesses overcome these challenges?**

**A:** Successful implementation requires:

- Investing in staff training and professional development
- Establishing clear service standards and monitoring compliance
- Cultivating a culture of customer-centricity throughout the organization
- Using technology to improve efficiency and personalization
- Regularly soliciting feedback from guests and using it to improve service delivery

## **Solution Signals Systems Oppenheim 2nd Edition**

**Q1: What is the general form of a continuous-time signal?** A1:  $x(t) = A \cos(2\pi ft + \phi)$ , where  $A$  is the amplitude,  $f$  is the frequency, and  $\phi$  is the phase angle.

**Q2: What is the Fourier transform of a rectangular pulse?** A2:  $\text{sinc}(f_c T)$ , where  $f_c$  is the center frequency and  $T$  is the pulse width.

**Q3: What is the convolution of two signals?** A3:  $y(t) = x(t) * h(t) = \int_{-\infty}^{\infty} x(\tau)h(t - \tau) d\tau$



**Q4: What is the transfer function of a low-pass filter?** A4:  $H(f) = 1 / (1 + j2\pi fRC)$ , where R is the resistance and C is the capacitance.

**Q5: What is the Nyquist sampling theorem?** A5: A band-limited signal can be fully reconstructed if it is sampled at a rate greater than twice its highest frequency.

**What are the 3 sections of switchgear?** Switchgear construction sections? Metal-clad switchgear enclosure are divided into three sections: the front section, the bus section, and the cable or termination section. Ground connection on a potential transformer (PT) or current transformer (CT) secondary terminal must be connected to the ground bus.

**What is the difference between switchgear and controlgear?** Usually these terms are applied to industrial switches. Switchgear consists of switch disconnectors, fused switches, switch fuses, isolators, while controlgear consists of DOL/Star, delta contactors, time clock/switches, relays, overload, stop buttons, PLCs.

**What are the three main types of switchgear?** Switchgear types There are three different classes of switchgear systems: low-voltage, medium-voltage, and high-voltage. High-voltage switchgears are those that control 75KV of power or more. Because these breakers are designed for high-voltage use, they often include improved safety features.

**What is the assembly of a switchgear?** A switchgear assembly has two types of components: Power-conducting components, such as switches, circuit breakers, fuses, and lightning arrestors, that conduct or interrupt the flow of electrical power.

**What are switchgear components?** The main parts of Switchgear are ACB, MCCB, Contactor, Relay, SPP, Capacitor, Starter, Isolator, Switch fuse unit, MCB, ELCB, MPCB, HRC and HBC fuse and fuse base and Changeover Switch.

**What makes up a switchgear?** Electrical switchgear refers to a centralized collection of circuit breakers, fuses and switches (circuit protection devices) that function to protect, control and isolate electrical equipment. The circuit protection devices are mounted in metal structures.

**What is a controlgear?** Control gear that is low or medium voltage is generally used in industrial applications where electrical equipment – particularly electric motors - needs to be protected from earth faults, surges and short circuits. It also provides simple control functions such as stop/start and building up motor speed.

**What does a switchgear control consist of?** Switchgear contains fuses, switches, and other power conductors. However, circuit breakers are the most common component found in switchgear. During an electrical fault, a circuit breaker will sense the anomaly and interrupt the power flow, effectively limiting damage to the system.

**What is a 480v switchgear?** The switchgear employs drawout type low voltage power circuit breakers. Switchgear is typically installed in: Industrial Plants – for power and lighting networks and feeders, power generation and other auxiliaries, and to provide power for machine tools and material handling equipment drivers.

**Is switchgear AC or DC?** Switchgear is designed to handle the special properties of DC power, including its higher voltage and lack of zero crossing points. The type of switchgear that you use in DC systems depends on the application. Vacuum interrupters can be used in applications where cost-effectiveness is a priority.

**What is the difference between switchgear and MCC?** MCCs. Both switchgear and MCCs deliver power and can contain circuit breakers. Switchgear, however, is designed to distribute voltages to other pieces of equipment.

**What is a switchboard vs switchgear?** Switchgear is designed to handle higher voltages that can reach 350 kV. Switchboards are designed to handle lower voltages that are generally less than 600 volts. Switchgears come with automatic features and come with manual control during emergency.

**What is the job description of a switchgear assembly?** Description: The Switchgear Assembler 1 is responsible for assembling fabricated metal parts for switchgear cabinets according to specifications. Duties/Responsibilities: Review, analyze, and follow various blueprints, diagrams, drawing, procedures, and work instructions to complete assemblies for enclosure buildings.

**What NEC code is switchgear?** NEC Article 100 defines the term “switchgear” as: “An assembly completely enclosed on all sides and top with sheet metal (except for

ventilating openings and inspection windows) and containing primary power circuit switching, interrupting devices, or both, with buses and connections.

**What is the difference between switchgear and main breaker?** While circuit breakers are a single device consisting of an external casing, electrical contacts, electrical arc extinguishing mechanisms, main operating mechanisms, and trip elements, switchgear contains numerous devices. Switchgear can consist of various switching and protecting devices.

**What is the checklist for switchgear?** It contains 9 items to check including verifying nameplate markings, inspecting for physical damage, checking anchorage and alignment, testing mechanical parts, ensuring compartment cleanliness, checking for missing parts, and torque testing bus bar connections.

**What is LT switchgear and its components?** Components of LT Switchgear: The term LT Switchgear includes low voltage Circuit Breakers, Switches, off load electrical isolators, HRC fuses, Earth Leakage Circuit Breaker, Miniature Circuit Breakers (MCB) and Molded Case Circuit Breakers (MCCB) etc i.e. all the accessories required to protect the LV system.

**What is the difference between switchgear and transformer?** Transformers step up or down the voltage level to facilitate the transmission and distribution of electricity. Switchgear provides protection of electrical circuits and a means of disconnection. UPSs protect equipment during voltage fluctuations and outages by providing backup and conditioned power.

**Why is it called a switchgear?** Switchgear, as the name implies, is a combination of switches, fuses, and circuit breakers that control and isolate electrical equipment.

**What are the raw materials for switchgear?** Parts of contactors, fuse switch , relays , starters. Made out of high end engineering plastics like Polyamide 25%GFFR , Polyamide 30%GF , Polycarbonate raw materials.

**What is the essential feature of switchgear?** The essential features of switchgear are: Complete reliability: Switchgear is added to the power system to improve reliability. When a fault occurs on any part of the power system, it must operate to isolate the faulty section from the remaining circuit.

**What is 3 phase switchgear?** A 3-phase electrical switchboard has four wires, one neutral and three active. This type of switchboard is powerful enough to successfully power three-phase electrical systems. They are often installed in commercial or larger buildings due to the number of electrical systems.

**What are the switchgear levels?**

**What are the parts of LV switchgear?** Low voltage switchgear is rated up to 1KV AC or 1500V DC and consists of low voltage products such as switches, earth leakage circuit breakers, HRC fuses, miniature circuit breakers (MCB), electrical isolators, Moulded case circuit breakers (MCCB) and Air circuit breakers (ACB), systems and equipment, cables and wires ...

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