Electricity class 10th pdf

CBSE Class 10 Science Notes Chapter 12 Electricity Pdf free download is part of Class 10 Science Notes for rapid revision. Here we gave NCERT Class 10 Science Notes Chapter 12 Electricity. According to the new CBSE Exam template, MC's questions for Class 10 Science PDF carries 20 marks. CBSE Class 10 Science Notes Chapter 12 Electricity: Electric current, electrical circuit, voltage or electrical potential, resistance and (Om's law). Electric current: The flow of an electric charge is known as an electric current, an electric current is carried out by moving electrons through the conductor. According to the convention, the electric current flows in the opposite direction to the movement of electrons. Electrical Circuit: The electrical circuit is a continuous and closed electric current path. Electric current: The electric current is denoted by the letter J. Electric current is expressed in the speed of the flow of electrical charges. The flow rate means the amount of charge flowing through a certain area per time unit. If the pure electrical charge (I) passes through the cross section of the conductor in time t, then where I am electric current, it is a clean charge and t time in the second. S.I. Electric Charge and Current Unit: S.I. Block Electric Charge Pendant (C). One pendant is almost equal to 6 × 1018 electrons. S.I. electrocute amp (A). Ampere is an electrical charge flow through the surface at a rate of one pendant per second. This means that if 1 electric charge pendant passes through the cross section within 1 second, it will be equal to 1 amp. Thus, 1 A and 1 C/1 with a small amount of electric current: A small amount of electric current is expressed in milliampere and microampere. Milliampere is written as MA and microampere as pA. 1 mA (milliamper) 10-3 A 1 rA (microamper) 10-6 Ammeter: the device for measuring electric current in the circuit., Charge: As a mass, the charge is the main property of matter. There are two types of charge (i) Positive charge. Negative charge. Positive and negative charge: A charge purchased by a glass rod with wiped silk is called a positive charge, and the charge purchased by the ebony rod when rubbed with wool is called a negative charge. Properties of electric charge: (i) Unlike fees attract each other and how charges repel each other. (ii) The force between the two charges changes directly as a product of the two charges and back as a square distance (r) between both charges (q1 and q2). S.I. unit charge pendant (C). 1 pendant 1 amp × 1 second. 1C and 1A × 1s Thus, the amount of charge that flows through the chain when one amp current flows through it in one second is known as a 1-kulomb charge. Electrical Potential and Potential Difference Electric Potential: Number of Electric Potential at a point called electrical potential. Potential. Difference: The difference in the amount of electrical power capacity between the two points in the electrical circuit is called the electrical potential difference. The electrical potential difference is known as voltage, which equals the amount of work done to move the charge block between two points against a static electric field. Thus, Tension and (frak) Workdone (Charge) Voltage or electrical potential difference is denoted by V'. Thus, V q (frak) W - Work done and - Charge S.I. Unit Electrical Potential Difference (Voltage) S.I. Unit electrical potential S.I. unit electric potential volt difference and designated 'V' It is named after Italian physicist Alessandro Volta. Since the joule is a unit of operation and the pendant is a unit of charge, the 1 volt electric power difference potential is equal to 1 joule work to be made to move the charge of one pendant from one point to another in the electrical circuit. Thus, 1V and 1Joule/1Coulomb 1J/1C 1V 1JC-1 Voltmeter: a device to measure the potential difference or electrical potential difference between the two points in the electrical circuit. Galvanometer: This is a device for detecting current in an electrical circuit. Om's law: Om's law states that the potential difference between two points is directly proportional to the electric current at a constant temperature. This means that the potential V difference changes like an electric current. V ∝ I V and RI I (Frak) R (frak) R (frak) where R is constant for a given conductor at a given temperature and is called resistance. Resistance: Resistance is a feature of a conductor that resists the flow of electric current through it. S.I. resistance unit ohm. Ohm is denoted by the Greek letter 'No' 1 Ohm: 1 ohm (I) resistance (R) equals the flow of 1A current through the conductor between two points with a potential difference equal to 1V. It is clear from the expression of the Om Act that the electric current through the resistor is inversely proportional to resistance. This means that the electric current will decrease with increased resistance and vice versa. Graph V (potential difference) compared to I (electric current) is always a straight line. Potential Difference Graph (V) Vs Electric Current (I) Tension, i.e. Potential diffrent (V) ? We know from om's law that, R q (frak) 15 Ω (frak 15) V and 225V Resistance: Resistance is the property of the conductor, because of which it resists the flow of electric current through it. The component used to resist the flow of electric current in the chain is called a resistor. In practical applications, resistors are used to increase or decrease the electric current. Variable resistance: a component of the electrical circuit that is used to regulate current, without changing the voltage from variable resistance. Reostat: This is a device that is used in the chain to provide variable resistance. The reason for the resistance is in the conductor: The flow of electrons in the conductor is an electric current. Positive conductor particles interfere with the flow of electrons, due to the attraction between them, this obstacle is the cause of resistance in the flow of electricity. Factors on which the resistance of the conductor depends: Resistance in the conductor depends on the nature, length and area of the cross-section of the conductor. (i) The nature of the material: Some materials create the least obstacle and are therefore called good conductors. Silver is the best conductor of electricity. While some other materials create more obstacles in the flow of electric current, i.e. the flow of electrons through them. Such materials are called bad conductors. A bad conductor is also known as insulators. Solid plastic is one of the best insulators of electricity. (ii) Conductor length: Resistance (R) directly proportional to the length of the conductor. This means that the resistance increases with the length of the conductor. This is the reason that long electrical wires create more resistance to electric current. Thus, the Resistance (R) ∝ the length of the conductor (l) or, R ∝ l ... (i) Cross-section area: Resistance R is inversely proportional to the cross-section (A) of the conductor. This means that the R will decrease with the increase in the conductor area and vice versa. The larger conductor area facilitates the flow of electric current through more area and thus reduces resistance. This is the reason why thick copper wire creates less resistance to electric current. Thus, resistance (R) ∝ 1/Area of the cross section of the conductor (A) or, R ∝ (Frak th L) .... (ii) From equations (i) and (ii) R ∝ (frac th l) R (frac) R (frac) R (frac) It is called electrical resistance of the conductor material. From the equation (iii) RA and Evil ⇒ - (Frak and RA). iv) S.I. Resistance: Since the unit S.I. R is q, S.I. unit of the M2 and S.I. unit of m. This is the S.I. unit ohm-meter (Yam). Resistance, q (frak and RA) Resistance is also known as specific resistance. Resistance depends on the nature of the conductor's material. Materials with resistance range from 10-8 to 10-6 m are considered very good conductors. Silver has a resistance equal to 1.60 × 10-8 m, and copper has a resistiveness equal to 1.62 × 10-8 m. Rubber and glass are very good They have a resistance in order from 10-12 m to 10-8 m. The resistance of materials varies depending on the temperature. The combination of resistors (series and parallel combination), heating effect of electric current and electricity. The combination of The Resistors (i) Series (ii) Parallel Combination. 1. Resistors in the series: When the resistors are connected from end to end, it is called in the series. In this case, the general resistance of the system equals the amount of resistance of all resistors in the system. Let the three R1, R2 and R3 resistors be connected in the series. The potential difference between A and B and V Potential difference between R1, R2 and R3 and V1, V2 and V3 Current flows through the combination - I We know that V1 and V2 V3.... (i) Under Om's law : V1 and IR1, V2 and IR2 and V3 and IR3 ..... (ii) Let, full resistance - Rs Then, V and IRs ... (iii) from equations (i) and (ii) and (iii) IRs - IR1 - IR2 - IR3 Rs - R1 and R2 - R3 When resistors are connected in a row, the current passing through each resistor is the same and equal to the common current. 2. Resistance in parallel: When the resistors are connected in parallel, the mutual total resistance of the system equals the sum of the mutual resistance of the resistors. Let the three resistors R1, R2 and R3 are connected in parallel. Potential difference between points A and B v Common current between point A and B, I Toki, flowing through the resistors R1, R2 and R3 I1, I2 and I3 respectively. We know that, i1 and I2 and I3 ..... (i) Because the potential difference between R1, R2 and R3 is the same - V under Om's law, in a parallel combination the potential difference between each resistor is the same and equals the overall potential difference. The total current through the chain can be calculated by adding electric current through individual resistors. Itotal No. 6A No. 48A, 30A, 12A and 24A 120A The heating effect of electric current: when the electric current is supplied in a purely resistor conductor, the energy of the electric current is completely dissipated in the form of heat and, as a result, the resistor heats up. The heating of the resistor due to the dispersal of electrical energy is widely known as the heating effect of the electric current. Some examples are these: When the electric energy is supplied to the electric lamp, the filament is heated, which is why it gives light. The heating of the electric lamp is due to the heating effect of the electric current. The reason for the thermal effect of the electric current: The electric current generates heat to overcome the resistance offered by the conductor through which it passes. The higher the resistance, the electric current will generate more heat. Thus, the electric shock generation when passing through the conductor is an inevitable consequence. This heating effect is used in many Electric iron, electric heater, electric geyser, etc. Law Joule heating: Let the electric current, I leak through the resistor, having resistance and R. The potential difference through the resistor is V. Charge, q flows on the circuit over time, t Thus, the work done in moving the charge (I) the potential difference (V ×), W and V × (i) electric current, I (frak) Replacement (frak) (ii) i.e., P and VI Since then, the electric energy is supplied on time?, so after multiplying both sides of the equation (ii) in time t, we get, P × t th VI × t y VIt..... (iii) ie, P and VIt Thus, for a sustainable current I, heat is produced (H) in time t equals VIt H and VIt i.e., H and VIt We know under the law of Om, V IK, replacing this V value in the equation (iii), we get, H IK × It H and I2Rt ..... iv) The expression (iv) is known as the Joule Heating Act, which states that the heat produced by the resistor is directly proportional to the square of the current given by the resistor, directly proportional to the resistance to the current and directly proportional to the time during which the course of the course through the resistor. Electric lamp: In an electric lamp, the filament of the lamp gives light due to the heating effect of electricity. Thread bulbs are usually made of tungsten metal, having melting points equal to 3380 degrees Celsius. Electric iron: The element of electric iron is made of alloys having a high melting poir' electric heater and geyser to operate on the same mechanism. Electric fuse: An electric fuse is used to protect electrical appliances from high voltage, if any. The electric fuse is made of metal or alloy metals such as aluminum, copper, iron, lead, etc. Fuse 1A, 2A, 3A, 5A, 10A, etc., used for domestic purposes. Suppose an electric heater consumes 1000 W at 220 W. Then an electric current in chain I (Frac P V) I (frak 1000W 220V) 4.5 A A A Thus, in this case 5A should be used to protect the electric heater in the flow of higher voltage. Electric power S.I. unit electricity watts (W). 1 W 1 volt × 1 amp 1B × 1A I kilowatt or 1 kW 1000 W Electricity consumption (electric energy) is usually measured in kilowatts. Unit of electric power kilowatt-hour (kWh). 1 kWh - 1000 watts × 1 hour, 1 unit - 1000 watts × 3600 with 1 kWh, 3.6 x 106 watts per second and 3.6 × 106 J Conductor: a material that can allow electron flows through itself called a conductor. It has a large number of free It offers low opposition in the flow of current. Insulator: A material that does not allow the flow of electrons through itself is called an insulator. It has less or no free electrons. It offers high opposition in the current flow. Electric current: The amount of the flow charge through any transverse conductor area during the time of the unity is called electric current. It is represented by the unit of electric current 'I' I q (Frac) or Ampere (A). An electric current is a scalable amount. Measured by an ammeter. The direction of a normal current (or practical current) is the opposite of the flow of electrons. Electrical potential: Electrical potential anywhere in the electric field is defined as the amount of work done to bring the unit of positive charge from infinity (from outside the electric field) to this point. V q (frak and W), S.I. unit electrical capacity JC-1 or Volt (V). This is a scalable amount. The Ve charge flows from higher to lower potential. Charge -ve flows from lower to higher potential. The difference in electrical potential between any two points in an electric field is called an electric potential difference. It is known as a voltage that equals the work done per unit charge between two points against a static electric field. VAB - VA - The difference in electrical potential is measured by a voltmeter. Om's Law: Under this law, in a permanent physical state, the potential difference between the conductor is directly proportional to the current flowing through the conductor. V ∝ I v IR... Where R is a proportionality, the constantly called resistance of the conductor ⇒ I (frak V R) R depends on the nature, geometry and physical condition of the conductor. Heat generated by electric current: The potential difference between two points in an electric field is equal to the work done when moving a unit charge from one point to another. Then, the work is done, W and W and I × t V and V × I × t from om law, we know that V and IR W IR × I × T and I2. Rt Since the heat produced by electric shock is equal to the work done, W H and W ⇒ H (heat) - I2Rt Joule. Resistance: The ratio of applied voltage to the voltage flowing in the conductor is called conductor resistance. ⇒ R q (fracas) S.I. Va-1 Resistance Unit or ohm (Ω). Resistance is a confrontation offered by a conductor in the current flow. Practically it is R ∝ L (L is the conductor's length) R ∝ 1/A (A is the conductor area) So, R ∝ L/A R and L/A ... Where p is proportionality, constantly called specific resistance of the conductor, it depends only on the nature (material) and the temperature of the conductor. Specific Resistance or Resistance - RA/L It's S.I. Unit is a combination of resistance: In this the current in all components is the same, but the potential in each component is different. If the resistance of R1, R2 and R3 is linked to the Potential V battery, the resistance of the combination of R and R1 and R2 and R3 is a parallel combination of resistance: In this combination, the current for each component is different. But the potential in all components is the same. If the resistance of R1, R2 and R3 is connected in parallel with the Potential V battery, then the resistance of the equivalence combination (frak 1) R His S.I. division is joule (J). Electricity (P): Electrical work done per unit of time is called electrical energy. Electric energy - (fracas) Electrical electrical electrical work, quad-core work done over time) or P (fracas) Electric energy is also defined as electric energy consumed per unit of time. P - (frak) S.I. a unit of electricity is Watt. When one joule of energy is used for one second, the electric energy is equal to one watt. Conclusion formula for electric energy: We know that electrical work is done, W and V × I × t or P q (frak) P and VI Electric power in watts and volts × ampere also V IR ... (According to om law) So P and IR × I2R We know I'm × (frak) R.R.) P (яп. . . . . .
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