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For a better understanding of electricity, one must have in-depth knowledge of the basic electrical terms & definitions. We will discuss the frequently used basic electrical terms and definitions in this post.Alternating Current (AC)An electric current that changes its direction many times a second at regular intervals. Alternating current, abbreviationAC, the flow of electric charges that periodically reverses. It starts, say, from zero, grows to a maximum, decreases to zero, reverses, reaches a maximum in the opposite direction, returns again to the original value, and repeats this cycle indefinitely.AmmeterAn instrument that measures the flow of electrical current in amperes. It is always connected in the series with the circuit. An ammeter is used to measure the magnitude of the current. The ammeter has very low resistance and the voltage drop across the ammeter is very low and this does not affect the measurement accuracy.AmpacityThe maximum amount of electric current a conductor or device can carry before sustaining immediate or progressive deterioration.The ampacity of a conductor is conductors ability to dissipate heat without being damaged the conductor or its insulation. The current flowing in the conductor more than its ampacity cause heating of the conductor and its insulation. The ampacity of the conductor depends on;The insulation temperature rating,Electrical resistance of the conductor materialThe ambient temperature,Capability of the insulated conductor to dissipate heat to the surrounds.The larger diameter conductor has the greater ampacity.Ah is the unit of measure for battery capacity. It is nothing but the multiplication of the current (in amperes) by the time (in hours) during which current flows. For example, a battery that provides 20 amperes for 10 hours. Then, the battery capacity is 20 X 10 = 200 Ah.Ampere (A) A unit of measure for the intensity of an electric current flowing in a circuit. One ampere is equal to a current flow of one coulomb per second. (I =Q/t) Therefore, 1A = 1C/Sec.Ampere is the unit of measurement of the electric current in a circuit. The ampere depends on the number of electrons passing through a circuit. The more the number of electrons passing through an electric circuit shows more electric current through the circuit. The flow of an electric current in a circuit is equal to the rate of flow of electrons(I=Q/t). In other words, therefore, 1A = 1C/Sec.Its the flow of a number of electrons in time, specifically 6.24 x 1018 electrons, per second. Perhaps more usefully, one amp flows when you have a voltage of 1 Volt driving 1 ohm. Thats the basis of Ohms law. It is called the unit of the electrical current measurement.The combination of reactive power and true power is called apparent power, and it is the product of a circuits voltage and current, without reference to the phase angle. Apparent power is measured in the unit of Volt-Amps (VA) and is symbolized by the capital letter S.The movable part of a generator or motor. It is made up of conductors which rotate through a magnetic field to provide voltage or force by electromagnetic induction. The pivoted points in generator regulators are also called armatures.A rotor is the part of the motor that rotates. It can have bars that conduct current, it can be wound, or it is just a rotor.An armature has bars that conduct current and brushes that provide an electrical path for the current. A wound rotor has slip rings to provide an electrical path for the current. A rotor may also have permanent magnets or just laminated bars that react electromagnetically with the stator. The armature is generally referred to when talking about DC motors.Capacitance is the property of two closely placed but not touching metal plates to hold an electrical charge given to them by being connected to an external EMF. They will hold this charge until it is released into a load connected between them. The capacitance is measured in Farads and is proportional to the area the plates have in common and inversely proportional to the distance between them. It can be increased by inserting different insulators between them.A capacitor is a passive two-terminal electrical component used to store electrical energy temporarily in an electric field. The forms of practical capacitors vary widely, but all contain at least two electrical conductors (plates) separated by a dielectric (i.e. an insulator that can store energy by becoming polarized).A dielectric can be glass, ceramic, plastic film, air, vacuum, paper, mica, oxide layer, etc. Capacitors are widely used as parts of electrical circuits in many common electrical devices. Unlike a resistor, an ideal capacitor does not dissipate energy. Instead, a capacitor stores energy in the form of an electrostatic field between its plates.In a nutshell, a device is used to store an electric charge, consisting of one or more pairs of conductors separated by an insulator. Commonly used for filtering out voltage spikes.A closed path in which electric current flows. The circuits can be in series, parallel, or in any combination of the two.A circuit breaker is a switching((ON/OFF/TRIP) device that is used for:For switching ON/ OFF the loadFor interrupting the circuit under the fault conditionWhen the load is switched on or off, the arc is produced between the contacts of the breaker. To quench the arc, the circuit breaker has a medium in which the make/ break of the contacts takes place. The circuit breaker can be of one of the following types; minimum oil circuit breaker, air circuit breaker, SF6, and vacuum type.Conductors have the ability to carry an electric charge which is current. Current is the movement of charge in the material. Good conductors have a low resistance to the flow of current. If the resistance to the flow of current is very high, then we have an insulator. Metal is a good conductor of current some metals are better than others. Copper and aluminum wire are the most common conductors.Air is not a perfect insulator, and even under normal conditions, the air contains many free electrons and ions. When an electric field intensity establishes between the conductors, these ions and free electrons experience forced upon them. Due to this effect, the ions and free electrons get accelerated and moved in the opposite direction.The charged particles during their motion collide with one another and also with the very slow-moving uncharged molecules. Thus, the number of charged particles goes on increasing rapidly. This increases the conduction of air between the conductors and a breakdown occurs. Thus, the arc establishes between the conductors. This is known as the corona.occur naturally in high-voltage systems unless care is taken to limit the electric field strength.Current is the rate at which electrons flow past a point in a complete electrical circuit. At its most basic,current = flow. Anampere, oramp, is the international unit used for measuring current. It expresses the number of electrons (sometimes called electrical charge) flowing past a point in a circuit over a given time.The change in an alternating electrical sine wave from zero to a positive peak to zero to a negative peak and back to zero.See Frequency.The average value of energy over a specified period of time.Dielectric constantA quantity measuring the ability of a substance to store electrical energy in an electric field.Dielectric strengthThe maximum electric field that a pure material can withstand under ideal conditions without breaking down (i.e., without experiencing failure of its insulating properties).DiodeA semiconductor device with two terminals, typically allowing the flow of current in one direction only. Diodes allow current to flow when the anode is positive in relation to the cathode.Direct Current (DC)An electric current that flows in only one direction.ElectrolyteAny substance which, in solution, is dissociated into ions and is thus made capable of conducting an electrical current. The sulfuric acid-water solution in a storage battery is an electrolyte.Electromotive Force(EMF) A difference in potential that tends to give rise to an electric current. Measured in volts.ElectronA tiny particle that rotates around the nucleus of an atom. It has a negative charge of electricity.Electron theoryThe theory which explains the nature of electricity and the exchange of free electrons between atoms of a conductor. It is also used as one theory to explain direction of current flow in a circuit.FaradA unit of measure for capacitance. One farad is equal to one coulomb per volt.Ferroresonance(nonlinear resonance) a type of resonance in electric circuits which occurs when a circuit containing a nonlinear inductance is fed from a source that has series capacitance, and the circuit is subjected to a disturbance such as the opening of a switch. It can cause overvoltages and overcurrents in an electrical power system and can pose a risk to transmission and distribution equipment and to operational personnel.FrequencyThe number of cycles per second. Measured in Hertz. If a current completes one cycle per second, then the frequency is 1 Hz; 60 cycles per second equals 60 Hz.FuseA circuit interrupting device consisting of a strip of wire that melts and breaks an electric circuit if the current exceeds a safe level. To restore service, the fuse must be replaced using a similar fuse with the same size and rating after correcting the cause of failure.GeneratorA device that converts mechanical energy into electrical energy.GroundThe reference point in an electrical circuit from which voltages are measured, a common return path for electric current, or a direct physical connection to the Earth.Ground Fault Circuit Interrupters (GFCI)A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.HenryA unit of measure for inductance. If the rate of change of current in a circuit is one ampere per second and the resulting electromotive force is one volt, then the inductance of the circuit is one henry.HertzA unit of measure for frequency. Replacing the earlier term of cycle per second (cps).ImpedanceThe measure of the opposition that a circuit presents to a current when a voltage is applied. Impedance extends the concept of resistance to AC circuits and possesses both magnitude and phase, unlike resistance, which has only magnitude.InductanceThe property of a conductor by which a change in current flowing through it induces (creates) a voltage (electromotive force) in both the conductor itself (self-inductance) and in any nearby conductors (mutual inductance). Measured in henry (H).InductorA coil of wire wrapped around an iron core. The inductance is directly proportional to the number of turns in the coil.InsulatorAny material where the electric current does not flow freely. Insulative materials, such as glass, rubber, air, and many plastics have relatively high resistance. Insulators protect equipment and life from electric shock.InverterAn apparatus that converts direct current into alternating current.Kilowatt-hour (kWh)The product of power in kW and time in hours. Equal to 1000 Watt-hours. For example, if a 100W light bulb is used for 4 hours, 0.4kWhs of energy will be used (100W x 1kW / 1000 Watts x 4 hours). Electrical energy is sold in units of kWh.Kilowatt-hour MeterA device used to measure electrical energy use.Kilowatt (kW)Equal to 1000 watts.LoadAnything which consumes electrical energy, such as lights, transformers, heaters, and electric motors.Load RejectionThe condition in which there is a sudden load loss in the system which causes the generating equipment to be over-frequency. A load rejection test confirms that the system can withstand a sudden loss of load and return to normal operating conditions using its governor. Load banks are normally used for these tests as part of the commissioning process for electrical power systems.Lightning A flash of light caused by an atmospheric electrical discharge between two clouds, or between a cloud and the earth.Lightning Arrester A device used to protect an electrical component from over-voltage.Mutual InductionOccurs when changing current in one coil induces a voltage in a second coil.Ohm() A unit of measure of resistance. One ohm is equivalent to the resistance in a circuit transmitting a current of one ampere when subjected to a potential difference of one volt.Ohms LawThe mathematical equation that explains the relationship between current, voltage, and resistance (V=IR).OhmmeterAn instrument for measuring the resistance in ohms of an electrical circuit.Open CircuitAn open or open circuit occurs when a circuit is broken, such as by a broken wire or open switch, interrupting the flow of current through the circuit. It is analogous to a closed valve in a water system.Parallel CircuitA circuit in which there are multiple paths for electricity to flow. Each load connected in a separate path receives the full circuit voltage, and the total circuit current is equal to the sum of the individual branch currents.PiezoelectricityElectric polarization in a substance (especially certain crystals) resulting from the application of mechanical stress (pressure).PolarityA collective term applied to the positive (+) and negative ( ) ends of a magnet or electrical mechanisms such as a coil or battery.PowerThe rate at which electrical energy is transferred by an electric circuit. Measured in Watts.Power FactorThe ratio of the actual electrical power dissipated by an AC circuit to the product of the r.m.s. values of current and voltage. The difference between the two is caused by reactance in the circuit and represents the power that does no useful work.Protective RelayA relay device designed to trip a circuit breaker when a fault is detected.Reactive PowerThe portion of electricity that establishes and sustains the electric and magnetic fields of AC equipment. Exists in an AC circuit when the current and voltage are not in phase. Measured in VARS.RectifierAn electrical device that converts an alternating current into a direct one by allowing a current to flow through it in one direction only.RelayAn electrical coil switch that uses a small current to control a much larger current.Reluctance-The resistance that a magnetic circuit offers to lines of force in a magnetic field.ResistanceThe opposition to the passage of an electric current. Electrical resistance can be compared to the friction experienced by water when flowing through a pipe. Measured in ohms.Resistor-A device usually made of wire or carbon. The resistor opposes the flow of electric current.RotorThe rotating part of an electrical machine such as a generator, motor, or alternator.Self Induction-The change in electric current cause induced voltage in an inductor.SemiconductorA solid substance that has a conductivity between that of an insulator and that of most metals, either due to the addition of an impurity or because of temperature effects. Devices made of semiconductors, notably silicon, are essential components of most electronic circuits.Series-Parallel CircuitA circuit in which some of the circuit components are connected in series and others are connected in parallel.Series CircuitA circuit in which there is only one path for electricity to flow. All of the current in the circuit must flow through all of the loads.ServiceThe conductors and equipment used to deliver energy from the electrical supply system to the system being served.Short CircuitWhen one part of an electric circuit comes in contact with another part of the same circuit, diverting the flow of current from its desired path.Solid-State CircuitElectronic (integrated) circuits which utilize semiconductor devices such as transistors, diodes, and silicon-controlled rectifiers.TransistorA semiconductor device with three connections, capable of amplification in addition to rectification.True PowerMeasured in Watts. The power manifested in tangible forms such as electromagnetic radiation, acoustic waves, or mechanical phenomena. In a direct current (DC) circuit, or in an alternating current (AC) circuit whose impedance is a pure resistance, the voltage and current are in phase.VARSA unit of measure of reactive power. Vars may be considered as either the imaginary part of apparent power or the power flowing into a reactive load, where voltage and current are specified in volts and amperes.Variable ResistorA resistor that can be adjusted to different ranges of value.Volt-Ampere (VA)A unit of measure of apparent power. It is the product of the rms voltage and the RMS current.Volt (V)A unit measure of voltage. One volt is equal to the difference of potential that would drive one ampere of current against one-ohm resistance.VoltageAn electromotive force or pressure that causes electrons to flow and can be compared to water pressure which causes water to flow in a pipe. Measured in volts.VoltmeterAn instrument for measuring the force in volts of an electrical current. This is the difference of potential (voltage) between different points in an electrical circuit. Voltmeters that have a high internal resistance are connected across (parallel to) the points where voltage is to be measured.Watt-hour (Wh)A unit of electrical energy equivalent to the power consumption of one watt for one hour.Watt (W)A unit of electrical power. One watt is equivalent to one joule per second, corresponding to the power in an electric circuit in which the potential difference is one volt and the current one ampere.WattmeterThe wattmeter is an instrument for measuring the electric power (or the supply rate of electrical energy) in watts of any given circuit.WaveformA graphical representation of electrical cycles which shows the amount of variation in amplitude over some period of time.Electrical energy is the energy derived from electric potential energy or kinetic energy of the charged particles. In general, it is referred to as the energy that has been converted from electric potential energy. We can define electrical energy as the energy generated by the movement of electrons from one point to another. The movement of charged particles along/through a medium (say wire) constitute current or electricity. A cell has two terminals a negative and a positive terminal. The negative terminal has the excess of electrons whereas the positive terminal has a deficiency of electrons. Let us take the positive terminal as A and the electrical potential at A is given by V(A). Similarly, the negative terminal is B and the electrical potential at B is given by V(B). Electric current flows from A to B, and thus V(A) > V (B).The potential difference between A and B is given byV = V(A) V(B) > 0Mathematically, electric current is defined as the rate of flow of charge through the cross-section of a conductor.Thus, it is given by I = Q/ t where I is the electric current and Q is the quantity of electric charge flowing through a point in time t.The potential energy of charge Q at A is Q V(A) and at B, it is Q V(B). So the change in the potential energy is given byUpot = Final potential energy Initial potential energy= Q [(V (B) V (A)] = Q V= I Vt (Since I = Q/ t)If we take the kinetic energy of the system into account, it would also change if the charges inside the conductor moved without collision. This is to keep the total energy of the system unchanged. Thus, by conservation of total energy, we have:K = UpotOr K = I Vt > 0Thus, in the electric field, if the charges move freely across the conductor, there would be an increase in the kinetic energy as they move.When the charges collide, the energy gained by them is shared between the atoms. Consequently, the vibration of the atoms increases resulting in the heating up of the conductor. Thus, some amount of energy is dissipated in the form of heat in an actual conductor. The basic unit of electrical energy is the joule or watt-second. An electrical energy is said to be one joule when one ampere of current flows through the circuit for a second when the potential difference of one volt is applied across it. The commercial unit of electrical energy is the kilowatt-hour (kWh) which is also knwon as the Board of trade unit (B.O.T).1 kwh = 1000 60 60 watt second1 kwh = 36 105 Ws or JoulesGenerally, one kwh is called one unit. A few examples of electrical energy are:In a car battery, a chemical reaction results in the formation of an electron which possesses the energy to move in an electric current. These moving charges provide electrical energy to the circuits in the car.Lightning, during a thunderstorm, is an example of electrical energy what we see as lightning is nothing but electricity discharging in the atmosphere.Electric eels generate electrical energy and use it against predators for defence.Why shouldnt you touch electrical equipment with wet hands? Find out answer to this question by watching the video. Electrical Energy Into Mechanical EnergyElectrical energy can be converted into other forms of energy like heat energy, light energy, motion etc. The best-known example are:Fan: The motor in Fan converts electrical energy into mechanical energyBulb: Here the electrical energy is converted into light energy.Home/Electrical/Electrical Terms and Definitions You Should Know (Electrician Basics) Last updated on February 27th, 2024. I wanted to take some time to share what Basic Electrical Definitions | What are electrical definitions? what is the use of studying the electrical terms definition? Now you have these questions right. Basic electrical definitions are used to define the electrical related object or thing or equipment. We are going to study about ohmslaw, electric circuit, electric power, electrical current, electrical resistance, electrical voltage, ampere definition in this post. Basic electrical definitions are mandatory for the electrical engineers. To know 101Basic Electrical Definitions read this article completely. In this table we are going to see the electrical definitions of accessory, appliance, arms reach, accessible, readily accessible, ampere and box. Accessory: a device, other than electrical current-using equipment, associated with an Electrical Installation. Appliance: an item of electrical current-using equipment. Arms Reach: a zone of accessibility to touch, extending from any point on a surface where a person may stand or move about, to the limits which such person may reach without assistance (i.e. without any tool or ladder, etc.). Such a distance may be taken as 2.5 m height from the standing surface, and 1.25 m horizontally from the standing position. Accessible:Threecommonusesofaccessible:(wiringmethods)Capableofbeingremoved orexposedwithoutdamagingthebuildingstructureoffinish,ornotpermanentlyenclosedby such.Wiresinconcealedracewaysarenotconsideredaccessible.(equipment) Admittingclose approach;notguardedbylockeddoorsorothereffectivemeans. (a) Readily AccessibleCapableofbeingreachedquicklyforoperation,renewal,or inspections withouttherequirementofclimbingoverorremovingobstaclesoruseof portableladders,chairs,etc. Ampere Definition:Theunitofintensityofelectricalcurrent(themeasureofelectricalflow),is abbreviatedaorA. The definition of ampere is only mention the unit of electrical current. The measurementof current is Ampere. Box:Anenclosuredesignedtoprovideaccesstotheelectricalwiringsystem.Usesincludebut arenotlimitedtoprovidedeviceandlightingoutletsandwiringsystemjunctionpoints.Specially designedboxesarerequiredforthesupportoflistedceilingfansweighinglessthan35lb.(15. kg).Fansexceedingthisweightlimitmustbesupportedindependentlyoftheoutletbox. Moulded Case Circuit Breaker In this table we are going to see the electrical definitions of cable tray, cable trunking, category1 circuit, category 2 Circuit, category 3 circuit, circuitbreaker, conductor, covered, insulated, device, distribution board, main distribution board (MDB), sub main distribution board (SMDB) and final distribution board (FDB). To know more electrical abbreviations and full forms for electrical interview click here. Cable Tray: A cable support consisting of a continuous base with raised edges and no covering. A cable tray is considered to be perforated where more than 30% of the material is removed from the base. Cable Trunking: A manufactured enclosure for the protection of cables, normally of rectangular cross-section, of which one side is removable or hinged. Category 1 Circuit: A Circuit (other than a fire alarm or emergency lighting Circuit) operating at LV. Category 2 Circuit: A Circuit (other than a fire alarm or emergency lighting Circuit) which supplies telecommunications equipment (such as telephones, intruder alarms, data transmission, call bells,etc.). Category 3 Circuit: A fire alarm or emergency lighting Circuit. CircuitBreaker:Adevicedesignedtoopenandcloseacircuitbynon-automaticmeansandto openthecircuitautomaticallyonapredeterminedovercurrentwithoutdamagingitselfwhen operatedaccordingtoitsrating. Miniature Circuit Breaker Conductor:Asubstanceorbodycapableoftransmittingelectricity.BareAconductorhaving nocoveringorelectricalinsulationwhatsoever. (a) CoveredAconductorencasedwithinmaterialofcompositionorthicknessthatisnot recognizedbytheNECaselectricalinsulation. (b) InsulatedAconductorencasedwithinmaterialofcompositionorthicknessthatis recognizedbytheNECaselectricalinsulation. Device:Aunitofanelectricalsystemthatisintendedtocarrybutnotutilizeelectricity. Distribution Board: An assembly designed for housing isolation switches and Protective Devices and for connecting multiple Circuits, including their associated neutral and Earth Conductors. The following are related definitions: (a) Main Distribution Board (MDB): The Distribution Board which accepts the main incoming LV supply from the Distribution Company or Owners transformer (b) Sub Main Distribution Board (SMDB): Any Distribution Board which is neither a Main Distribution Board nor a Final Distribution Board (c) Final Distribution Board (FDB): A Distribution Board which supplies Final Circuits only. In this table we are going to see the electrical definitions of earth, locally earthed system, distribution company earthed system, earth conductor, main earth conductor (MEC), circuit earth conductor (CEC), earth leakage protection (ELP), earth leakage protected system (ELPS), electric circuit definition, electric ring circuit, electric radial circuit, electric final circuit, electric distribution circuit, electrical current definition, directcurrent (D.C), alternating current(A.C), electrical installation definition, electrical voltage definition, high voltage (HV), low voltage (LV), extra-low voltage (ELV), separated extra-low voltage (SELV), protective extra-low voltage (PELV), reduced low voltage (RLV), electric power, electrical resistance, equipment, class I equipment, class II equipment and class III equipment. Earth: The conductive mass of Earth, whose electrical potential (Electrical Voltage) at any point is conventionally taken as zero. The following are related definitions: (a) Locally Earthed System : A system of supply where the Owner provides a Main Earth Terminal for the Electrical Installation, which is connected to a sufficient number of local Earth Electrodes to provide a maximum Earth Resistance measured at the Owners Main Earth Terminal of not more than 10 Ohms. (b) Distribution Company Earthed System : A system of supply where the Distribution Company provides a connection to the Owners Main Earth Terminal, using the distribution network Earthing system. Earth Conductor: A conductor used to connect Exposed Conductive-Parts of an Electrical Installation and associated Appliances to Earth, and providing a means for the safe passage of earth fault electrical current. This includes the following defined terms: (a) Main Earth Conductor (MEC): Conductors connected between Earth Electrodes and Main Earth Terminals (b) Circuit Earth Conductor (CEC): Conductors connecting all Circuits emanating from Main Distribution Boards, Sub Main Distribution Boards, Final Distribution Boards including Circuits connecting to equipment and Appliances. Outside these Regulations these may also be known as the Circuit Protective Conductor (CPC) or Earth Continuity Conductor (ECC). Earth Leakage Protection (ELP): the provision of protection against electric shock due to Indirect Contact by the use of RCDs or other sensitive earth leakage Protective Devices which automatically disconnect the supply sufficiently quickly so as to prevent Danger to persons. Earth Leakage ProtectionSystem (ELPS): a system of supply where Earth Leakage Protection is provided on Final Circuits and an additional ELPS is provided at the Electricity Intake. Electric Circuit Definition: A set of phase and neutral conductors installed as a group to supply electric power to a location and which originate from one Protective Device. The following are Electric Circuit Definitions: (a) Electric Ring Circuit: A Electrical Circuit which is wired from a single Protective Device, being run through an area to be supplied (via appropriate socket-outlets, switched flex outlets, etc.) and returning back to the same Protective Device, thus forming an electrically continuous loop. (b) Electric Radial Circuit: A Electric Circuit which is wired in a radial or branch configuration, Emanating from a Protective Device, to the area to be supplied. (c) Electric Final Circuit: A Electric Circuit which directly supplies Appliances (normally via socket-outlets, switched flex outlets, isolators, ceiling roses, etc.) (d) Electric Distribution Circuit: A Electric Circuit connecting between Distribution Boards Electrical Current Definition Amovementofelectricityanalogoustotheflowofastreamofwater. Electrical Current is also defined as flow of electrons. (a) DirectCurrent (D.C)Anelectricalcurrentflowinginonedirectiononly(i.e.currentproduced usingabattery). (b) Alternating Current(A.C)Aperiodicelectricalcurrentthatreversesitsdirectionatregular intervals. Electrical Installation Definition: an electrical installation comprises any fixed or temporary cable, switchgear or other electrical equipment or apparatus within a Premises or other place where there is an electricity supply (including outdoor locations). Fixed or portable electrical Appliances are not considered part of the Electrical Installation, although these Regulations do include requirements for the connection of Appliances (e.g. plugs and socket-outlets). Electrical Voltage Definition :Theunitofelectromotiveforce (emf),themeasureofelectrical pressure,isabbreviatedvorV, andElectrical VoltageisrepresentedbyV.TheElectrical Voltage (ofacircuit)istheeffective(greatestroot-mean-square)differenceofpotentialbetween anytwoconductorsofthecircuitconcerned. Somesystems,suchas3-phase4-wireandsingle-phase3-wiremayhavemultiplecircuitsof differingvoltages. The NominalElectrical Voltage is the value assigned to a circuit to conveniently designateitsvoltageclass(e.g.120volts,240volts,480volts).Theactualelectrical voltageofthecircuit canvary. (a) High Voltage (HV): An A.C. Voltage greater than Low Voltage and less than 36 kV between phases or 21 kV between any phase and Earth (internationally referred to as Medium Voltage) (b) Low Voltage (LV): An A.C. Voltage below 1000 V between phases, or below 600 V between any phase and earth or a D.C Voltage below 1500 V between conductors, or below 900 V between any conductor and earth (c) Extra-Low Voltage (ELV): An Voltage not exceeding 50 VAC or 120 VDC whether between live conductors or between live conductors and earth (d) Separated Extra-Low Voltage (SELV): An Extra- Low Voltage system which is electrically Separated from Earth in such a way that a single fault cannot give rise to the risk of electric shock (e) Protective Extra-Low Voltage (PELV): A system which has the same features as SELV except that connection of Exposed-Conductive-Parts to Earth Is allowed (f) Reduced Low Voltage (RLV): A electrical voltage which does not exceed 55 VAC between phase and Earth or 110 VAC between phases. Electric Power: Electric power is the rate, per unit time, at which electrical energy is transferred by an electric circuit. The SI unit of electric power is the watt, one joule per second. Electrical power measurement is in wattage. Electrical Resistance: The electrical resistance definition is a measure of its opposition to the flow of electric current. Electrical Resistance is inverse quantity to the electrical conductance. SI unit of electrical resistance is R. Electrical resistance measured by ohms. Equipment:Ageneralterminincludingmaterial,fittings,devices,alliances,fixtures,apparatus, andsimilaritemsusedasapartof,orinconnectionwith,anelectricalinstallation. (a) Class I Equipment: equipment which includes a means for connection of Exposed-Conductive Parts of the equipment to the Earth Conductor, thus providing protection against electric shock in case of failure of the basic insulation of the equipment or other fault condition. (b) Class II Equipment: equipment which does not include a means for connection to an Earth Conductor, and which provides supplementary insulation in addition to the basic insulation of the equipment such that a breakdown of the basic insulation will not present a dangerous electrical voltage on Exposed-Conductive-Parts. (c) Class III Equipment: equipment in which protection against electric shock relies on supply at SELV and in which Voltages higher than SELV are not generated in the equipment. In this table we are going to see the electrical definitions of fuse, GFCI(groundfaultcircuitinterrupter), ground, kilowatt-hour, labeled, lamp, listed and NEC(National Electrical Code). Fuse:Anoverelectrical currentprotectivedevicewithacircuitopeningpartthatisheatedandbrokenby thepassageofanover electricalcurrentthroughit. GFCI(GroundFaultCircuitInterrupter):Adeviceintendedfortheprotectionofpersonnelthat de-energizesacircuitorportionofacircuitwhentheelectrical currenttogroundexceedsa presetvalue. GroundFaultisthenameappliedtothisundesiredcircuitcondition. Indwelling units(e.g. houses,apartments),GFCIprotectioniscurrentlyrequiredinbathrooms,garages, outdoors, unfinishedbasements,kitchensandwetbarsinks. Otherspecificinstallationsand/or areasmay alsonecessitatetheneedforprotection. Ground:Aconductingconnection,intentionaloraccidental,betweenanelectricalcircuitor equipmentandtheearth,orsomeconductingbodythatservesinplaceoftheearth.Other associatedtermsare:Groundedconductor Asystemorcircuitconductorthatisintentionally connectedtoground. Thisconductorhasalsobeenreferredtoastheneutralorcommon conductor. Groundingconductoraconductorusedtoconnectequipmentorthegrounded circuitofawiringsystemtothegroundingelectrode(s). Ungroundedconductora electrical current carryingconductornotconnectedtoground. Kilowatt-hour:Workdoneatthesteadyrateequivalentto1000wattsinonehour. Electric Powerutility companiesbasetheirbillinguponthenumberofkilowatt-hours(KWH)consumed. Labeled:Equipmentormaterialsthatalabelorotheridentifyingmarkofalistingorganization hasbeenattached. Lamp:Ageneraltermforvariousdevicesforartificiallyproducinglight. Listed:Equipmentand/ormaterialsincludedinalistpublishedbyanorganizationconcerned withproductevaluationandproductionoflisteditems. Thelistingstateswhethertheitemmeets designatedstandardsorissuitableforuseinaspecifiedmanner. Listingorganizations acceptabletojurisdictionauthoritiesincludeUnderwritersLaboratories(UL)andCSA. NEC(NationalElectricalCode):AdocumentproducedbytheNationalFireProtection Associationforthepurposeofthepracticalsafeguardingofpersonsandpropertyfromhazards arisingfromtheuseofelectricity. Authoritieshavinglegaljurisdictionoverelectricalinstallations adoptthecodeformandatoryapplication. In this table we are going to see the electrical definitions of ohm, ohms law, overcurrent, overload, phase, protective device, raceway, residual current device (RCD), receptacle, service and single-phase. Ohm:Theunitofelectricalresistanceandimpedance,abbreviatedwiththe electricalsymbolomega,W. Electrical resistanceistheoppositionofferedbyasubstancetothepassageofelectrical current. Impedanceistheapparentresistanceinacircuittotheflowofalternatingcurrent (A.C). Ohms Law:Astatementoftherelationship,discoveredbytheGermanscientistG.S.Ohm, betweentheelectrical voltage,currentandelectrical resistanceofacircuit.Itstatesthe electrical voltageofacircuitin voltsisequaltotheproductofthecurrent inamperesandthe electrical resistance inohms. Ohms Law V=IR, Electrical Current is directly proportional to the electricalvoltage and inversely proportional to the electrical resistance. Overcurrent: Anyelectrical currentinexcessoftheratedcurrentorampacity. Itmayresultfrom overload,shortcircuitorgroundfault. Overload:Operationinexcessofnormalfull-loadratingorratedampacitywhichcouldcause damageordangerousoverheatingifcontinuedforasufficienttime. Afault,suchasashortcircuit orgroundfault,isnotanoverload. Phase:thepointorstageintheperiodtowhichtherotation,oscillation,orvariationhas advancedrelativetoastandardpositionorstartingpoint.electrically,oneoftheelectrical voltage sources ofanalternatingcurrent (A.C)electricalsystemwhosevoltagestateismeasuredrelativeto astandard point. Protective Device: a device installed at the start of a Circuit which will automatically disconnect the input of electricity in the event of a fault or overload occurring on that Circuit. Such devices include, but are not limited to, fuses, fuse links, Miniature Circuit Breakers (MCB), Moulded Case Circuit Breakers (MCCB) and Residual Current Devices (RCD). Raceway:Anenclosedchannelofmetallicornonmetallicmaterialsdesignedexpresslyfor holdingelectrical wires,electrical cables,orbusbars. Examplesareelectricalmetallictubing(EMT),flexible Residual Current Device (RCD): a Protective Device which is installed to automatically isolate the supply to a Circuit or Distribution Board when the vector sum of electrical currents in the phase and neutral conductors reaches a preset value. Receptacle:adeviceinstalledfortheconnectionofasinglecontactdevice. Receptaclesprovide ameansofconnectingapparatusthatutilizeelectricitytothewiringsystem. Service:theconductorsandequipmentfordeliveringelectricalenergyfromthesupplysystem (e.g.theelectricpowerutility)tothewiringsystemofthepremisesserved. Single Phase:Asystemofalternatingcurrent (A.C)electric powerwherethephaserelationship Between ungroundedconductorsiseither0or10degrees. In this table we are going to see the electrical definitions of three phase, transformer and watt (definition of watt). Three Phase:Asystemofalternatingcurrent(A.C)electric powerwherethephaserelationship between ungroundedconductorsiseither0or120degrees Transformer:Anapparatusforconvertinganalternatingelectricalcurrentfromahightoalow potential(electrical voltage)orviceversa. Usesoftransformersincludebutarenotlimited tothe conversionofutilitytransmissionvoltagetothevoltageofthepremiseswiringsystem and conversionofvoltageforusewithchimes,alarmsystemsandlow-voltagelighting. Transformers canalsobeusedtocompensateforminorvariationsequipmentvoltagerequirements. Transformersonlychangeelectrical voltageandcurrent. Current Transformer Watt (Definition of watt) :Theunitofelectric powerorrateofworkrepresentedbya electricalcurrent ofone ampereunderapressure ofonevolt(abbreviatedworW). The horsepowerisapproximately equalto746watts. Wattageratingsoflampsactuallymeasurethe electricpowerconsumption notthe illuminating capability. Watt is always calculated by one hour of the power consumption in electrical. In this article we seen 101 basic electrical definitions of accessory, appliance, arms reach, accessible, readilyaccessible, ampere, box, cable tray, cable trunking, category 1 circuit, category 2 Circuit, category 3 circuit, circuitbreaker, conductor, covered, insulated, device, distribution board, main distribution board (MDB), sub main distribution board (SMDB), final distribution board (FDB),earth, locally earthed system, distribution company earthed system, earth conductor, main earth conductor (MEC), circuit earth conductor (CEC), earth leakage protection (ELP), earth leakage protectionsystem (ELPS), electric circuit definition, electric ring circuit, electric radial circuit, electric final circuit, electric distribution circuit, electrical current definition, directcurrent (D.C), alternating current(A.C), electrical installation definition, electrical voltage definition, high voltage (HV), low voltage (LV), extra-low voltage (ELV), separated extra-low voltage (SELV), protective extra-low voltage (PELV), reduced low voltage (RLV), electric power, electrical resistance, equipment, class I equipment, class II equipment, class III equipment, fuse, GFCI (GroundFaultCircuitInterrupter), ground, kilowatt-hour, labeled, lamp, listed, NEC(National Electrical Code), ohm, ohms law, overcurrent, overload, phase, protective device, raceway, residual current device (RCD), receptacle, service, single-phase, three phase, transformer and watt (definition of watt). Hope you understand this article about the Basic Electrical Definitions. Incase of any doubt please comment below. Please follow our website for future updates. Thank you for visiting our website ElectricianWorld.Net Basic electricity is described in many ways. When an electric circuit flows through a conductor, a magnetic field (or "flux") develops around the conductor. The highest flux density occurs when the conductor is formed into a coil having many turns. In electronics and electrical technology, a coil is usually known as an inductor. If a steady DC current is run through the coil, you would have an electromagnet - a device with the properties of a conventional magnet, except you can turn it on or off by placing a switch in the circuit.Basic Electrical TheoryThere are four basic electrical quantities that we need to know:CurrentPotential Difference (Voltage)PowerResistanceElectrical CurrentCurrent is a flow of charge. Each electron carries a charge of 1.6 10-19 coulombs. This is far too small to be any use, so we consider electricity to flow in packets called coulombs. When there is a flow of 1 coulomb per second, a current of 1 amp is flowing. Current circuit electric is measured in ampres, or amps (A).Potential DifferencePotential difference is often referred to as voltage. There are several ways of defining voltage; the correct physics definition is energy per unit charge, in other words, how big a job of work each lump of charge can do.Power in a CircuitPower in a circuit can be worked out using the simple relationship:Power (W) = Voltage (V) Current (A)Electrical Resistant BehaviourThis is the opposition to the flow of an electric current.There's reciprocity in the interaction between electron flow and magnetism. If you sweep one pole of a magnet quickly past an electrical conductor (at a right angle to it), a voltage will be momentarily "induced" in the conductor. The polarity of the voltage will depend upon which pole of the magnet you're using, and in which direction it sweeps past the conductor.This phenomenon becomes more apparent when the conductor is formed into a coil of many turns.Figure 1shows a coil mounted close to a magnet that is spinning on a shaft. As the north pole of the magnet sweeps past the coil, a voltage is induced in the coil, and, if there is a "complete" circuit, current will flow. As the south pole of the magnet sweeps past, a voltage of opposite polarity is induced, and current flows in the opposite direction.This is the fundamental operating law of a generator. The output, known as alternating current, is the type of power that electric utility companies supply to businesses and homes. A practical generator would likely have two coils mounted on opposite sides of the spinning magnet and wired together in a series connection. Because the coils are in a series, the voltages combine, and the voltage output of the generator will be twice that of each coil.Figure 2is a graph of the voltage produced by such a generator as a function of time. Let's assume that this happens to be a 120-volt, 60-Hz generator. The voltage at one point in the cycle momentarily passes through 0 volts, but it's headed for a maximum of 169.7 volts. After that point, the voltage declines, passing through 0 volts, then reverses its polarity, and has a negative "peak" of -169.7 volts.This curve is known as a sine wave since the voltage at any point is proportional to the sine of the angle of rotation. The magnet is rotating 60 times a second, so the sine wave repeats at the same frequency, making the period of a single cycle one-sixtieth of a second.Electricity appears in two forms: alternating current (AC) and direct current (DC). Direct current does not change directions-- the electron flow is always from the negative pole to the positive pole -- although as we mentioned before, the electrons themselves don't really "move," it's the holes that are created that "move." Direct current is almost always what is used inside of electronic devices to power the various internal components, but it is a harmful thing in audio signals, which are alternating current. Alternating current does change direction-- standard household electricity is alternating current, because of its flexibility in traveling long distances. It changes direction at a specific frequency-- 60 times per second, or 60 Hz (in the United States, Japan, and a couple of other countries; in Europe the standard is 50 Hz). There is also the issue of the Ohm to consider. Audio signals vary their direction-alternation according to the frequency in question.AC - ALTERNATING CURRENTAlternating current or AC electricity is the type of electricity commonly used in homes and businesses throughout the world.While the flow of electrons through a wire in direct current (DC) electricity is continuous in one direction, the current in AC electricity alternates in direction. The back-and-forth motion occurs between 50 and 60 times per second, depending on the electrical system of the country.AC is created by an AC electric generator, which determines the frequency. What is special about AC electricity is that the voltage in can be readily changed, thus making it more suitable for long-distance transmission than DC electricity. But also, AC can employ capacitors and inductors in electronic circuitry, allowing for a wide range of applications.DC - DIRECT CURRENTIn a direct-current system, it's easy to determine voltage because it is nonvarying or varies slowly over time. You can simply make a measurement with a DC voltmeter. But in an AC circuit, the voltage is constantly changing.Electrical engineers state the voltage of an AC sine wave as the RMS (root-mean-square), a value equal to the peak value of the sine wave divided by the square root of two, which is approximately 1.414. If you know the RMS voltage, you can multiply it by the square root of two to calculate the peak voltage of the curve. If you were to power a light bulb from 120V(RMS) AC, you would get the same amount of light from the bulb as you would by powering it from 120V DC. Yet another device uses electromagnetic induction: the transformer.Just as an iron core improves the inductance of a coil, it has the same positive effect in a transformer, and most power transformers are wound on iron cores.In order to understand how electricity is created and works it is necessary to look at how all matter is structured. All matter is made up of molecules that have a certain number of atoms, for example one molecule of water is made up of two atoms of hydrogen and one of oxygen giving a symbol of H_2O. All other matter also has a symbol like this and is made up of atoms.To be able to understand electricity however, the atom must be broken down even further into a nucleus, electrons and protons. The nucleus is made up of positively chargedprotonsand neutrally chargedneutronsthat generally balance the number of negatively chargedelectrons,which are moving around the nucleus in a similar manner to the planets circling the sun.The outer ring of electrons is called theValency Shelland the electrons contained in this ring are calledValence Electrons.These are the electrons which are knocked or forced out to form a flow of electricity. If one or more electrons are moved out of the the atom it will leave the atom with more protons than electrons, which means that the atom will be positively charged.One rule that is very prevalent in all forms of electricity, and also magnetism, is that like charges, or poles, repel and unlike charges, poles, will attract. This means that a positively charged object will attract a negatively charged one, but if both charges are the same then they will repel each other. Understanding electrical terms is compulsory for engineers. As you study electricity in your engineering program, and as you work with electricity in power plants, and industrial plants, you will hear, read, and use various electrical terms. These terms have very exact meanings. You must know what each one means if you are to understand other people and make them understand you. The following terms explain the meaning of the most basic electrical terms.Electric current the electrical term:Electric current is one of the basic electrical terms described as when electrons flow from one place to another, they make a current. The electrons always flow from a negative point to a positive (or less negative) point, because electrons have a negative charge.Unfortunately, the direction of the current flow can be confusing. Some people think of a positive current that is in the opposite direction from the electron flow- that is, from positive to negative instead of from negative to positive. You must be careful to distinguish between the two kinds of flow. Both kinds are commonly used in words and diagrams.The so-called positive current is from positive to negative. The electron flow is from negative to positive. The word current means electron flow from negative to positive. The figure below shows the difference between positive current and electron flow. Circuit:Electrons flow along with some kind of path going from one point to another. This path is called a circuit. If the path has no gaps to stop the flow of electrons, the circuit is said to be complete or closed.In case the path has a gap that the electrons cannot cross- for example, a break in a wire where the ends are separated by air- the circuit is said to be open. If another pathway provides an easier way a short circuit for the electrons to go from one point to another, that part of the circuit is said to be shorted. The figure below shows the circuit that is complete, open, and short.Potential difference:This term is the correct name for what is often called voltage or electromotive force. Potential difference is a measure of how much potential energy an electron has in one place compared to another place.The greater the potential energy, the more work an electron can do in going from one place to the other. The potential energy of each electron also determines how much current will flow from one point to another in a given circuit. Resistance:Every electrical pathway from one place to another has the property of resisting the flow of electrons. Some pathways resist the flow only slightly. For example, a thick copper wire offers very little resistance. Other pathways- for example, an air gap-offer great resistance. The greater the resistance, the less the current for a given potential difference.Cell:Electricity can be produced by chemical means. The arrangement of materials that produces a potential difference between two points by chemical resources is called a cell. Familiar cells include the dry cells used in flashlights, calculators, and radios.Battery:When you connect two or more cells together, the combination is called a battery. If your calculator takes two dry cells, the grouping is called a two-cell battery.The storage battery in a car or truck is usually a six-cell battery that produces a potential difference of 12V between the terminals. Each cell in such a battery produces a potential difference of 2 V between its internal terminals. The terminals of the cells are connected in such a way that their potential differences add together between the external terminalsAs you study the remaining lessons in this course and the other courses in your series, make sure you learn the proper terms to use in discussing electricity, and the exact meaning of each term. Always use the correct terms, even if other people do not. If you use the wrong terms, you are likely to be misunderstood. In addition, other people will think you know less about electricity than you actually do. Conductor:A material that allows the easy flow of electric current due to its high conductivity. Common conductors include metals like copper and aluminum.Insulator:A material that restricts the flow of electric current due to its low conductivity. Insulators are used to prevent electrical leakage and include materials like rubber and plastic.Voltage (Voltage Drop):Voltage, measured in volts (V), is the electrical potential difference between two points in a circuit. It represents the force that pushes electrons through a conductor. Voltage drop refers to the decrease in voltage along a conductor due to its resistance.Current (Amperage):Current, measured in amperes (A), is the rate of flow of electric charge (electrons) in a circuit. It indicates how many electrons pass through a point in a circuit per unit of time.Ohms Law:A fundamental relationship in electricity that states the current (I) flowing through a conductor is directly proportional to the voltage (V) across it and inversely proportional to the resistance (R) of the conductor. It is expressed as V = I * R.Resistor:A passive component in a circuit is designed to introduce a specific amount of resistance to control the flow of current. Resistors are commonly used for voltage division and current limiting.Power:Power, measured in watts (W), is the rate at which electrical energy is consumed or produced in a circuit. It can be calculated using the formula P = V * I, where V is voltage and I is current.Circuit Breaker:A safety device used in electrical circuits to protect against overcurrent and prevent electrical fires. It opens (breaks) the circuit when excessive current flows, thus interrupting the power supply. Fuse:A safety device that contains a thin wire that melts when excessive current flows through it, breaking the circuit and protecting against overcurrent. Fuses need to be replaced after they blow.Ground:The reference point in an electrical circuit is typically connected to the Earth for safety reasons. Grounding helps protect against electrical shock and ensures stable operation of equipment.AC (Alternating Current):AC is an electrical current that periodically reverses direction, causing the voltage to alternate between positive and negative values. Most household electricity is AC.DC (Direct Current):DC is an electrical current that flows consistently in one direction, with a constant polarity. Batteries and many electronic devices use DC power.Transformer:A device that changes the voltage level of AC electricity. Transformers are used for voltage step-up (increasing voltage) or voltage step-down (decreasing voltage) and are crucial in power distribution. Capacitor:An electronic component that stores electrical energy in the form of an electric field. Capacitors are used in circuits for various purposes, including energy storage and timing.Inductor:An electronic component that stores electrical energy in the form of a magnetic field when current flows through it. Inductors are used in circuits for filtering and energy storage.

Define peak factor in basic electrical engineering. Define amplitude in basic electrical engineering. Define frequency in basic electrical engineering. Define phase difference in basic electrical engineering. Define phase in basic electrical engineering. Define power in basic electrical engineering. Define power factor in basic electrical engineering. Define slip in basic electrical engineering. Define node in basic electrical engineering. Define average value in basic electrical engineering. Define resonance in basic electrical engineering. Define form factor in basic electrical engineering. Define rms value in basic electrical engineering. Define time period in basic electrical engineering. Define cycle in basic electrical engineering.