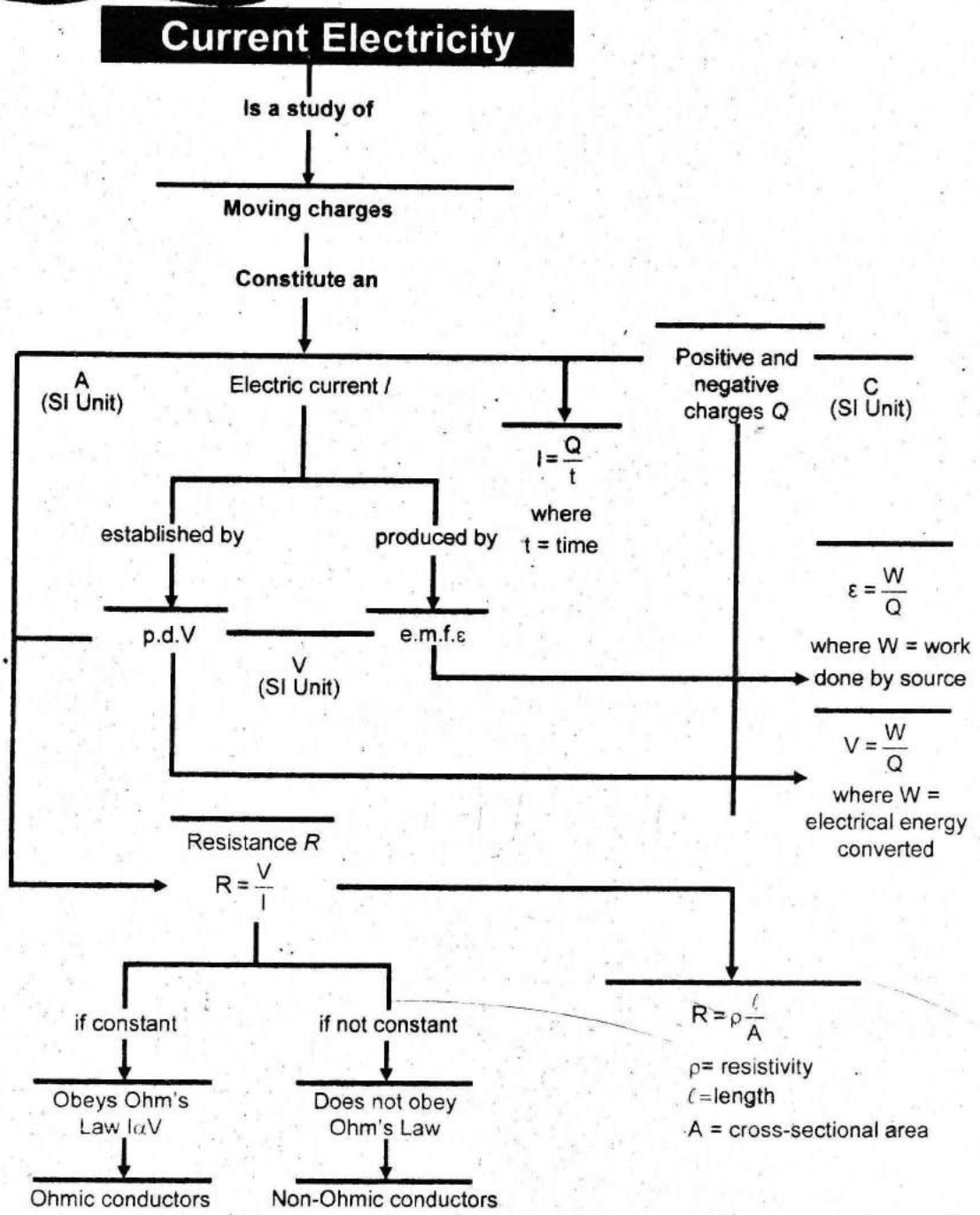
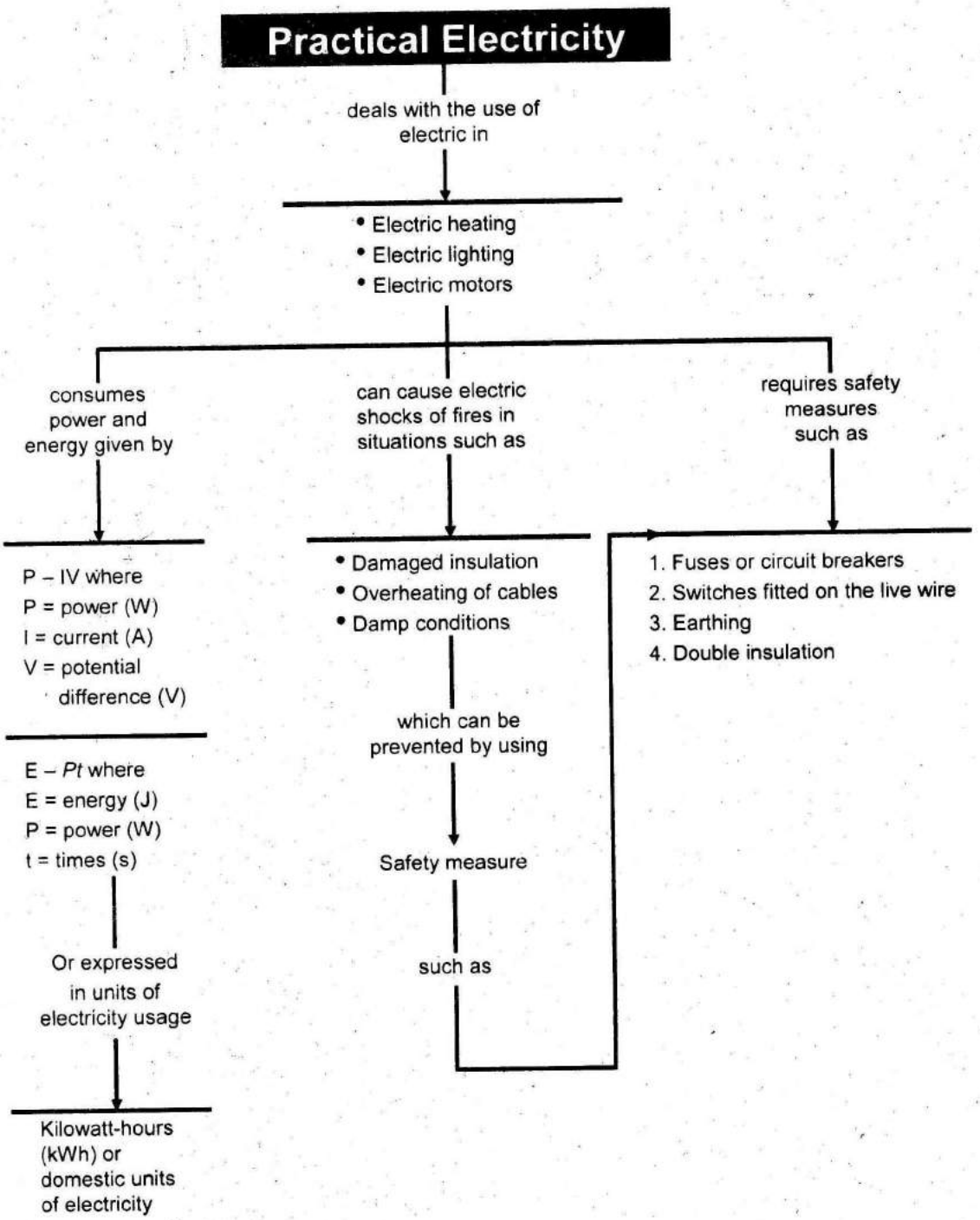
CHAPTER 14

CURRENT ELECTRICITY

CONCEPT MAP




Practical Electricity
deals with the use of electric in
• Electric heating
• Electric lighting
• Electric motors
consumes power and energy given by
can cause electric shocks of fires in situations such as
requires safety measures such as
P – IV where
P = power (W)
I = current (A)
V = potential difference (V)
E – Pt where
E = energy (J)
P = power (W)
t = times (s)
Or expressed in units of electricity usage
Kilowatt-hours (kWh) or domestic units of electricity
• Damaged insulation
• Overheating of cables
• Damp conditions
which can be prevented by using
Safety measure
such as
1. Fuses or circuit breakers
2. Switches fitted on the live wire
3. Earthing
4. Double insulation

TOPICAL MULTIPLE CHOICE QUESTIONS

14.1 Electric Current

(1) In metals, current is produced only due to the flow of
(a) Protons (b) Electrons (c) Free electrons (d) Neutrons

(2) In electrolyte, current is produced due to the flow of
(a) Positive charge (b) Negative charges
(c) Both positive and negative charges (d) None of these

(3) The rate of flow of electric charge through any cross-sectional area is called
(a) Electrostatics (b) Electric current (c) e.m.f (d) Voltage

(4) The SI unit of electric current is
(a) Volt (b) Farad (c) Capacitance (d) Ampere

(5) The equivalent current of positive charges which flows through a conductor is known as
(a) Electronic current (b) Conventional current (c) Electrostatic (d) Ampere

(6) The current due to negative charges and an equivalent current due to positive charges always flow in the
(a) Opposite direction (b) Same direction
(c) Perpendicular to each other (d) None of these

(7) In electricity, we assume that electric current is always due to the flow of
(a) Negative charges (b) Neutral particles
(c) Positive charges (d) Both negative and positive charges

(8) The conventional current of positive charges flows from a point of
(a) Higher potential to a point of lower potential (b) Lower potential to a point of higher potential
(c) Lowe potential to a point of lower potential (d) Higher potential to a point of higher potential

(9) The current constituted by negative charges flows from a point of
(a) Higher potential to a point of a lower potential
(b) Lower potential to a point of higher potential
(c) Lower potential to a point of lower potential
(d) Higher potential to a point of higher potential

(10) When we connect a battery across a conductor, the energy is provided to the charges in the conductor by the
(a) Magnetic field produced in the conductor
(b) Electromagnetic field produced in the conductor
(c) Electric field produced in the conductor
(d) None of the above

(11) Energy is produced to transfer the electrons from positive terminal of the battery to the negative terminal by the
(a) Electrical process (b) Chemical process (c) Thermal process (d) Magnetic process

(12) The current through a metallic conductor is due to the motion of
(a) Protons (b) Neutrons (c) Electrons (d) Free electrons

(13) In liquids and gases, the current is due to the motion of
(a) Negative charges (b) Positive charges
(c) Both negative and positive charges (d) Neutral particles

(14) Free electrons are
(a) Tightly bound (b) Fixed (c) Loosely bound (d) Tightly fixed

(15) The direction of conventional current flowing in a circuit is

(a) from negative to positive in the external circuit and from positive to negative within the source of potential difference (battery)

(b) from positive to negative in the external circuit and from negative to positive within the source of P.D.

(c) From positive to negative throughout the circuit.

(d) From negative to positive throughout the circuit.

(16) The direction of the electronic current in the closed circuit is

(a) along the flow of electrons

(b) opposite to the flow of electrons

(c) from positive to negative in the external circuit

(d) along the direction of positive charges.

(17) If a charge 'Q' flows through any cross-section of the conductor in time 't' second, the current 'I' is given by

(a) $I = Qt$ (b) $I = Q/t$ (c) $I = t/Q$ (d) $I = Q2/t$

(18) One coulomb per second is equal to

(a) One volt (b) One Ampere (c) One watt (d) One Ohm

(19) Which of the following represents an electric current?

(a) Erg C^{-1} (b) Cs^{-1} (c) $J\ S^{-1}$ (d) Dyne S^{-1}

(20) If 1 ampere current flows through 2m long conductor, the charge flow through this in 1hour will be

(a) 3600 C (b) 7200 C (c) 1C (d) 2C

(21) Batteries convert

(a) electrical energy into heat energy (b) electrical energy into chemical energy

(c) chemical energy into electrical energy (d) heat energy into chemical energy

(22) The electronic current is due to the flow of

(a) negative charge (b) positive charge (c) both (a) and (b) (d) none of the above

(23) The conventional current is due to the flow of

(a) negative charge carriers (b) neutral charge

(c) positive charge carriers (d) both negative and positive charges carriers.

14.2 Potentional Difference

14.3 E.M.F

(24) The energy required to move a charge from one point to another in the circuit is called

(a) e.m.f (b) Potential difference (c) Resistance (d) Volt

(25) Volt is a unit of

(a) Potential difference (b) e.m.f

(c) Potential difference and e.m.f. (d) None of these

(26) The energy supplied in driving one coulomb of charge round a complete circuit in which the cell is connected is called

(a) e.m.f (b) Potential difference (c) Resistance (d) Volt

(27) The instrument with which we can detect the presence of current in a circuit is knows as

(a) Voltmeter (b) Ammeter (c) Galvanometer (d) Ohm meter

(28) In order to detect the current, galvanometer is connected

(a) In parallel (b) In series

(c) May be parallel or in series (d) Any where in the circuit

(29) **If the needle of galvanometer shows some deflection, it would indicate the**
(a) Presence of current (b) Absence of current
(c) A large current (d) None of these

(30) **A galvanometer is a very**
(a) Large instrument (b) Small instrument
(c) Insensitive instrument (d) Sensitive instrument

(31) **A resistance which is connected with the galvanometer in order to convert it into ammeter should have**
(a) High resistance (b) Very high resistance
(c) Low resistance (d) Very low resistance

(32) **The resistance of an ammeter should be**
(a) Height (b) Very high (c) Low (d) Very low

(33) **In order to measure the current in a circuit, ammeter should be connected**
(a) Parallel to battery (b) In series in the circuit
(c) May be parallel or in series (d) None of these

(34) **When ammeter is connected in the circuit, the positive terminal of ammeter should be connected with the**
(a) Negative terminal of the battery (b) Positive terminal of the battery
(c) Any terminal of the battery (d) None of these

(35) **The potential difference can be directly measured by the instrument known as**
(a) Ammeter (b) Potentio-meter (c) Voltmeter (d) Ohm meter

(36) **The series resistance which is connected with galvanometer to convert it into voltmeter usually has value in**
(a) Ohms (b) Several hundred ohms
(c) Several thousand ohms (d) Hundred thousand ohms

(37) **Voltmeter is always connected in a circuit in**
(a) Series (b) Parallel
(c) May be in series or parallel (d) None of these

(38) **A good voltmeter is that which draws**
(a) No current (b) Small current (c) Large current (d) Very large current

14.4 Ohm's Law

14.5 V-I Characteristics of Ohmic and Non Ohmic Conductors

(39) **The relation V = IR represents**
(a) Ampere law (b) Coulomb's law
(c) Faraday's law (d) Ohm's law

(40) **Ohm's law is applicable to**
(a) Liquids only (b) Gases only
(c) Liquid conductors only (d) Metallic conductors only

(41) **Ohm is the unit of**
(a) Current (b) Capacitance (c) Electric intensity (d) Resistance

(42) **Ohm is defined as**
(a) Volt/Coulomb or VC^{-1} (b) Volt/Ampere or VA^{-1}
(c) Ampere/Volt or CV^{-1} (d) Ampere/Volt or AV^{-1}

(43) **The resistance of a conductor through which a current of one ampere is flowing when the potential difference across its ends is one volt, is called**
(a) One volt (b) One coulomb (c) One Ohm (d) One ampere