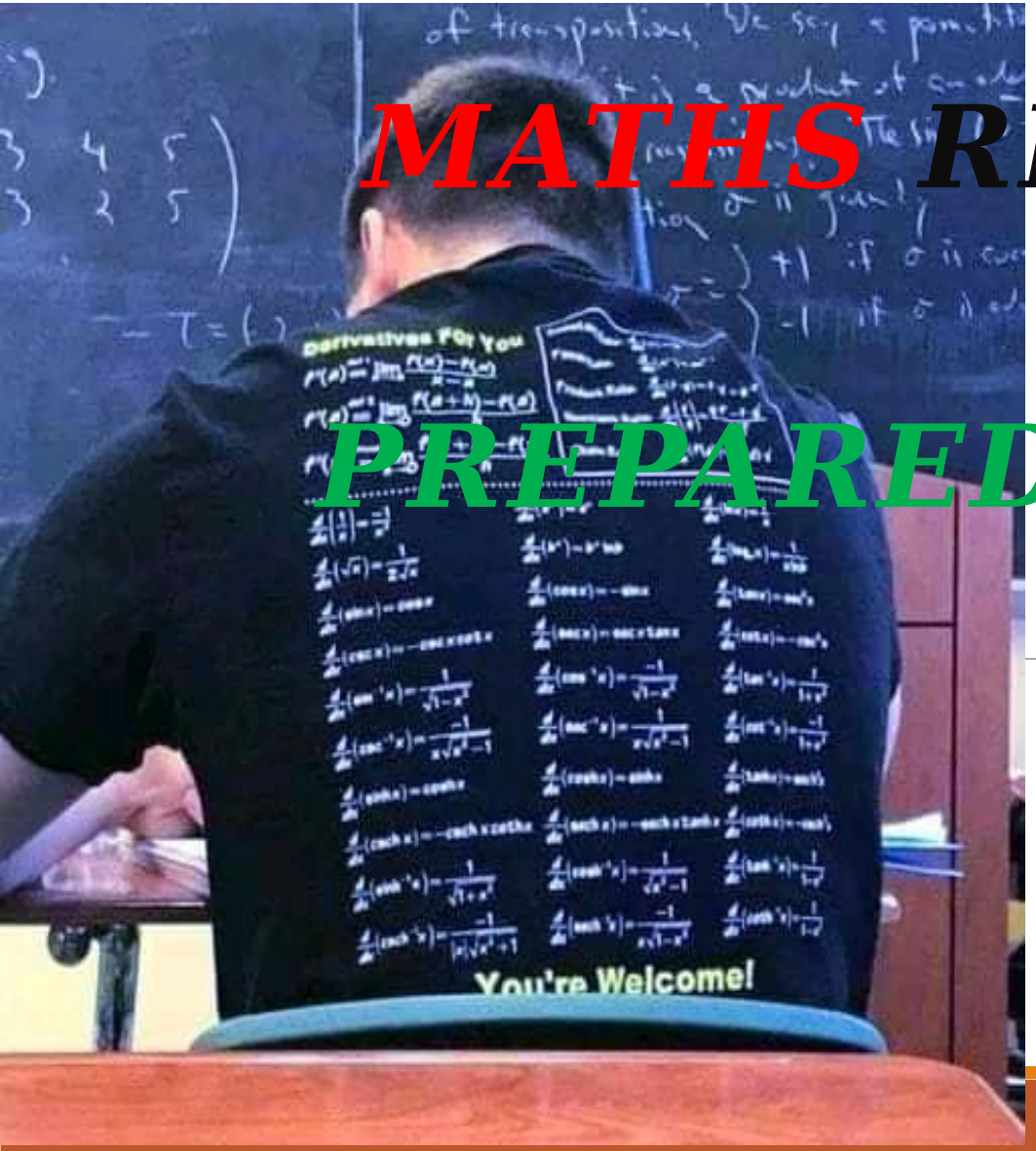
NUR AFRICA ACADEMY



MATHS REVISION NOTE FOR GRADE – 7

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UNIT 8

ELECTRICITY AND MAGNETICSM

PART-I MAGNETISM

9.1 Magnets

- A magnet :- is a piece of iron that attracts substances like iron, steal and nicked at a distance.

Types of magnets

Natural magnets

- naturally occurring magnets

E.g. lodestone

Artificial magnets

- magnets that are made by peoples.

- made of iron and alloys of iron e.g. steal

Magnetic and Non-magnetic substances

- Materials are classified into two as

***Magnetic substances**:- are substances that can be attracted by magnets. Eg. Iron, steal, cobalt, nickel*

Non- magnetic substances

- are substances which cannot be attracted by magnets. Eg Rubber, paper, wood, plastics, copper, Aluminum, gold grass, cloth.

Magnetization

- is the process of making a magnet by stroking or other methods.

Properties of Magnets

a. Magnetic poles

Magnetic poles are the two ends of a magnet where the attractive forces are strong.

-The end of the magnet that points north is called the North pole (N-pole).

- The end of the magnet that points south is called the south pole (s. pole).

The following are some basic properties of magnet.

A magnet attracts pieces of iron and steel.

A magnet is suspended freely, it always comes to rest with its ends pointing in a north-south direction.

It has two poles.

Its two poles always exist in pairs no matter what its shape or size may be.

B. The law of magnetism

States that: “unlike poles attract each other and like poles repel each other”.

A compass

- a compass is a small suspended magnet to show the geographic northern direction.

- it consist of bar magnet that it can turn freely in the horizontal plane.

Note

Generally:- There are two poles of magnets.

North pole- attracts the south pole of another magnet

South pole – attracts the north pole of another. Magnet. But

North pole with north pole or south pole with south pole of another magnet repels each other.

8.2 Mapping Magnetic lines of force

Magnets exert force at a distance.

The space around a magnet is called ***magnetic field.***

- is a region where a magnetic pole would experience a force or exerts a force.

- is represented by imaginary lines of force called magnetic lines of force.

Magnetic lines of force are imaginary lines which continuously represent the direction of the magnetic field.

Properties of magnetic lines of forces

i) *- they are closed lines.*

ii) *They never cross each other.*

iii) *Near the magnetic poles, magnetic force is stronger, the lines of force are closer.*

The closeness of the magnetic field lines shows the strength of the magnetic force.

8.3 Uses of magnets

used to indicate directions on seas, oceans, air and ground.

Used for lifting up iron or steal to higher

Used in the construction of electric bells, motors radio, generators.

Used to separate magnetic substances.

PART -2 ELECTRICITY

8.4 Electrostatics

- ***Is a branch of electricity that studies electric charges at rest.***

Charges

Electric charge is a characteristic property of many sub atomic particles.

It is represented by (Q).

Its unit is Coulomb (C).

Types of charges

There are two types of electric charges.

These are positive & negative charges

Neutron is neutral particle.

It doesn’t have a charge.

Proton is positively charged particle.

Electron is negatively charged particle.

8.5 Methods of Charging a Body

- ***Charging*** *is a process of electrifying bodies.*

  - *removing or adding electrons from a body.*

- *There are different methods charging a body:*

  i) Charging by rubbing

  ii) Charging by conduction

i) Charging by rubbing

Rubbing of two bodies cause transfer of electrons from one body to another body.

e.g. rubbing of glass rod is rubbed with silk

ii) Charging by conduction

Charging by conduction involves sharing of electrons between charged and uncharged bodies.

The process of charging a body by touching it with a charged body is called ***charging by conduction or sharing.***

Discharging a body *is the process of removing electric charges from a charged body.*

8.6 Law of Electrostatics

Law of electrostatics states that : "like charges repel each other and unlike charges attract each other".

They are non-contact forces.

Electroscope and its use

An electroscope is a simple device used to study the properties of charges.

Uses of Electroscope

-***To determine that charges move through metals.***

-***To determine whether a body is charged or not.***

-***To detect the sign of the charge on a body.***

8.7 Electric Current & Potential Difference

Electric Current

Is the rate of flow of electric charge.

It is the amount of charge that flows per second.

The SI unit of electric Current is Ampere symbolized by A.

Electric Current = =

Where I - is the current

Q -is the amount of charge flow

t – is time taken.

One Ampere is equal to one coulomb moved in one second.

1A = 1

1 Ampere = 1000 milliampere ; 1mA = 0.001 A

1 A = 1000,000 micro Ampere; 1A = 0.000001 A

✓ *Electric current is measured with a device called* ***an ammeter.***

✓*The effects of electric current are* ***heating, lighting, magnetic, etc.***

Sources of Potential Difference

- ✓ *The common sources of potential difference are* ***electric cells & generators.***
  - ***Battery*** *is a combination of two or more electric cells.*

It is a common source of potential difference.

Potential difference is also called ***Voltage.***

The unit of potential difference (voltage) is ***Volt (V).***

The instrument used to measure potential difference is ***Voltmeter.***

Primary & Secondary cells

chemical cells *change chemical energy into electrical energy.*

There are two types of chemical cells. These are ***primary & secondary cells.***

1) Primary Cells

- ✓ *are cells which produces current as a result of chemical changes.*

once they are used exhaustively ,they cannot used again. E.g. ***dry cell***

2) Secondary Cells

- ✓ *can be recharged and used again and again.*
- ✓ *They are also known as* ***storage cells & accumulators.*** *E.g.* ***Car battery***

8.8 Electric Circuit

- ❑ *A complete path through which electric current flows is called* ***electric circuit.***
- ❑ *A simple electric circuit is constructed from a source of* ***potential difference, a device & a switch*** *connected to each other by connecting wires.*

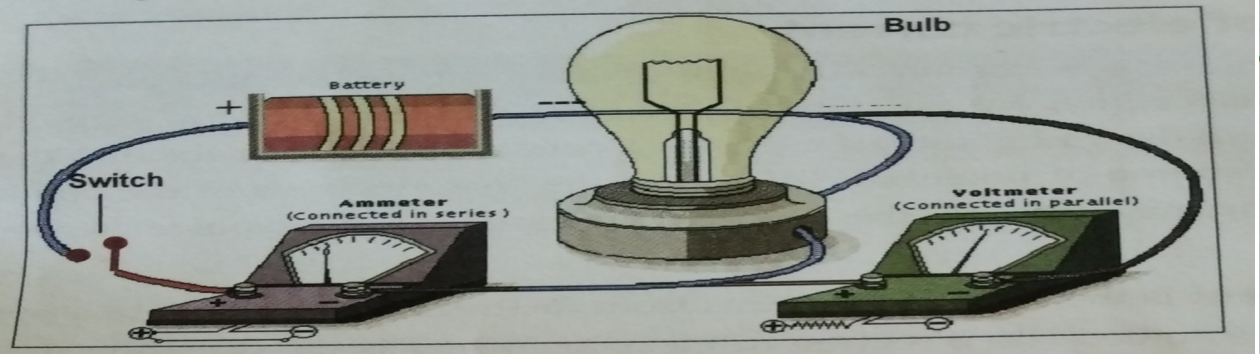


Fig 8.17 Simple electric circuit

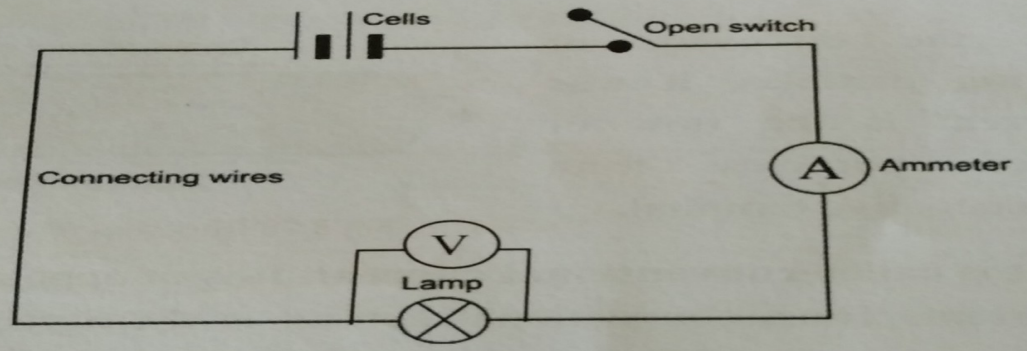


Fig 8.18 Electric current drawn with symbols

Items	Symbols
Switch	
Cell	
Battery	
Lamp	
Resistor	
Voltmeter	
Ammeter	
Crossing wires	
Joined wires	

Fig 8.19. Symbols of elements of an electric circuit

Conductors & Insulators

Conductors *are materials made up of atoms with a large number of free electrons.*

Free electrons *are in the outer most orbit of an atom.*

Conductors *are materials that allow an electric current to flow through them.*

Insulators *have few free electrons or no free electron.*

Insulators *are materials that do not allow an electric current to pass through them.*

A simple electric circuit *is used as a tester to check whether a material is a conductor or insulator.*

THANK YOU !!!!!

