GOVERNMENT OF KARNATAKA

KARNATAKA RESIDENTIAL EDUCATIONAL INSTITUTIONS SOCIETY

BENGALURU

EVOLUTION

TOWARDS SUCCESS

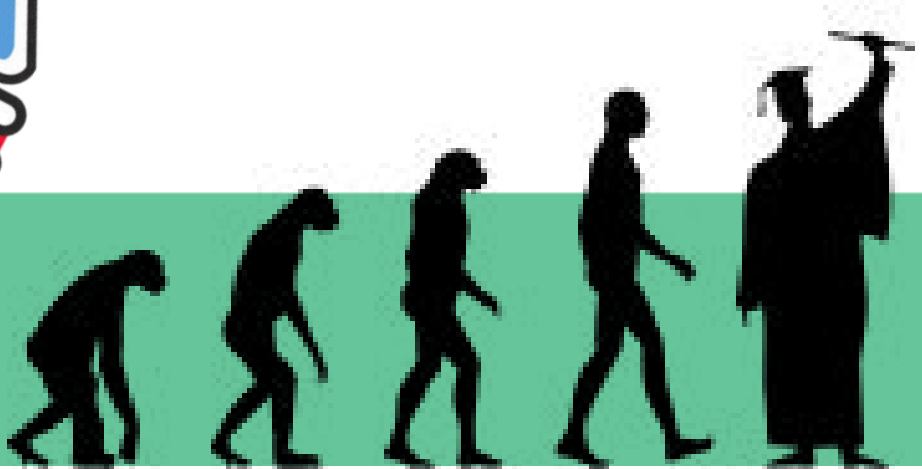
EXAM BOOSTER

FOR

SSLC SCIENCE

Precise Accurate &

Exam Oriented.



OUR RESPECTED OFFICERS

CONCEPT

SRI RAMESH DESAI
EXECUTIVE DIRECTOR
KREIS
BANGALORE

GUIDED BY

SRI NAGESH S S
JOINT DIRECTOR (EDU)
KREIS
BANGALORE

SRI UMESH N S
DEPUTY DIRECTOR (EDU)
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DR. PREETHI A
ASSISTANT DIRECTOR (EDU)
KREIS
BANGALORE

SRI BELLA SHETTY
EDUCATIONAL CONSULTANT
KREIS
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ALL STAFF
HEAD OFFICE
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T: MADDURU, D: MANDYA M. NO
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TEACHER OF SCIENCE
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T: CHANNAPATNA, D: RAMANAGARA
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TEACHER OF SCIENCE
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T: YELBURGA, D: KOPPAL
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THIMMALAPUR
T: HOSPET, D: VIJAYANAGARA
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T: KORATGERE, D: TUMKURU
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TEACHER OF SCIENCE 401-KRCRS(SC)
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T: NELAMANGALA
D: BENGALURU RURAL
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SUNITHA B M
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VADDINAKATTE
T: SANDUR, D: BALLARY
9686082460

PATTERN OF QUESTION PAPER

SL.NO	QUESTION TYPE	NO. OF QUESTIONS VS MARKS	TOTAL MARKS
1	Multiple Choice questions	8 x 1	8
2	1 Mark Questions	8 x 1	8
3	2 Marks Questions	8 x 2 (2 INTERNAL CHOICES)	16
4	3 Marks Questions	9 x 3 (4 INTERNAL CHOICES)	27
5	4 Mark Questions	4x4 (1 INTERNAL CHOICE)	16
6	5 Mark Question	5x1	5
Total	**38 Questions**		**80 Marks**

WEIGHTAGE OF MARKS

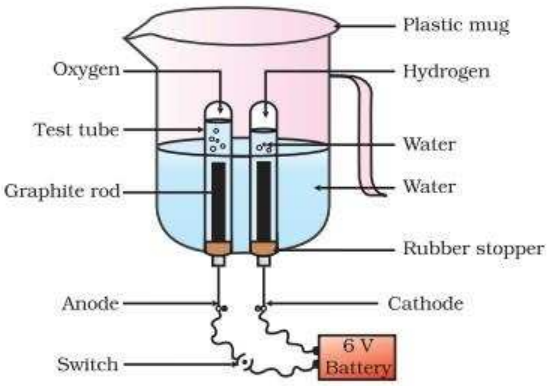
SL.NO	DIVISION	NAME OF THE CHAPTER	WEIGHTAGE IN MARKS
1	**PHYSICS**	10. Light Reflection and Refraction	28
		12. Electricity	
		13. Magnetic effects of Electric current	
		14. Sources of Energy	
2	**CHEMISTRY**	1. Chemical Reaction and Equations	25
		2. Acids, Bases and Salts	
		3. Metals and Non-metals (Concepts 3.4 and 3.5 will not be considered for evaluation)	
		4. Carbon and its Compounds (Concepts 4.3, 4.4 and 4.5 will not be considered for evaluation)	
		5. Periodic Classification of Elements	
3	**BIOLOGY**	6. Life Processes	27
		7. Control and coordination	
		8. How do organisms Reproduce (Concepts 8.1 and 8.2 will not be considered for evaluation)	
		9. Heredity and evolution	
		15. Our Environment	
Total			**80**

TABLE OF CONTENTS

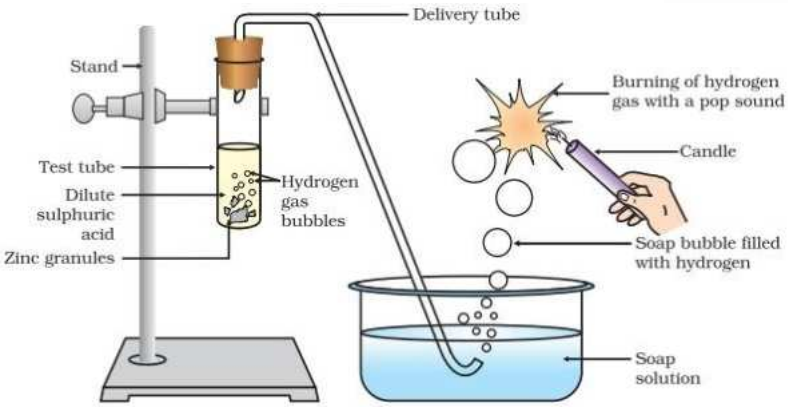
Note:

- This proposed plan is only to get minimum marks.
- It is framed purely on the basis of previous year question papers and model papers by KSEEB.
- Students can even score more by referring textbook under the guidance of your teacher.

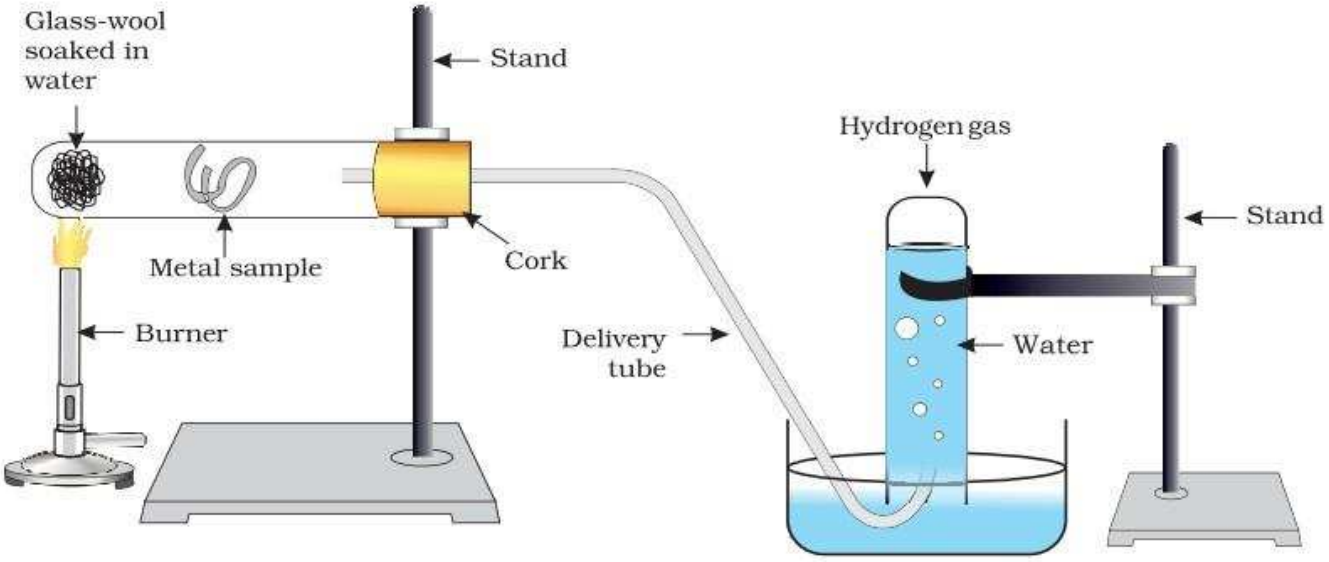
1 DIAGRAMS



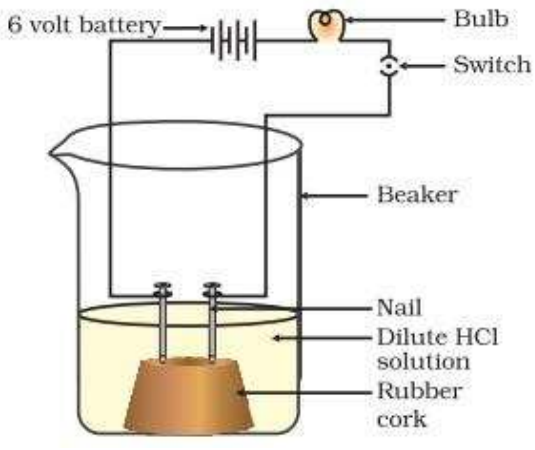
ELECTROLYSIS OF WATER



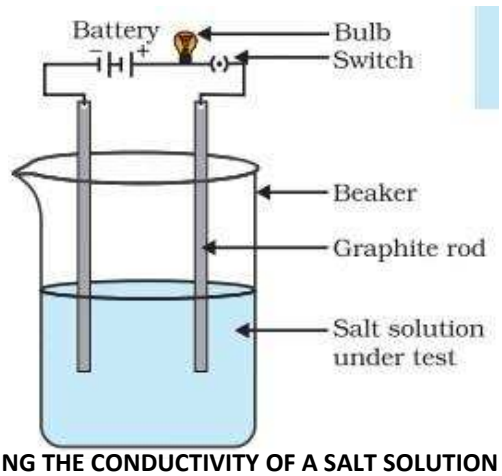
REACTION OF ZINC GRANULES WITH DILUTE SULPHURIC ACID AND TESTING HYDROGEN GAS BY BURNING



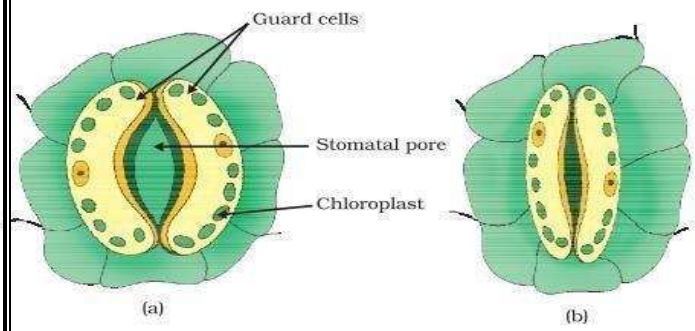
ACTION OF STEAM ON A METAL



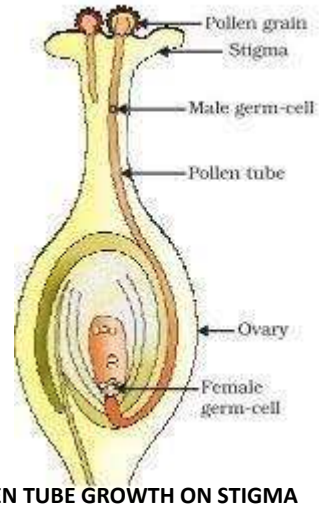
ELECTROLYSIS OF WATER



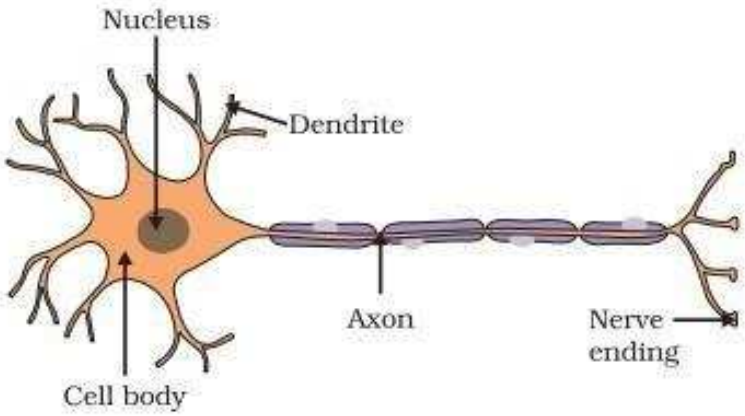
TESTING THE CONDUCTIVITY OF A SALT SOLUTION



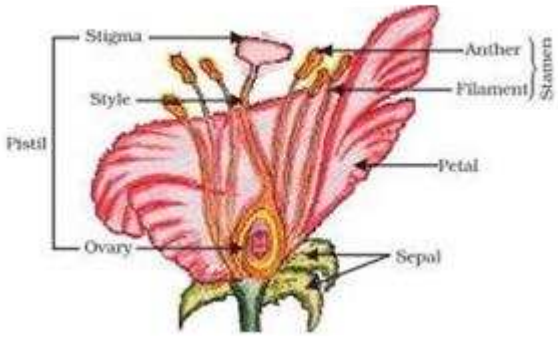
A) OPEN STOMATAL PORE
B) CLOSED STOMATAL PORE



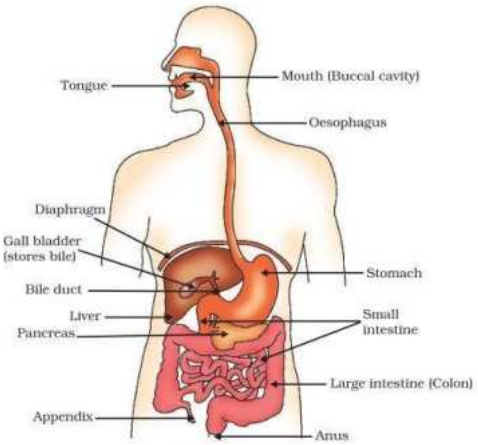
POLLEN TUBE GROWTH ON STIGMA



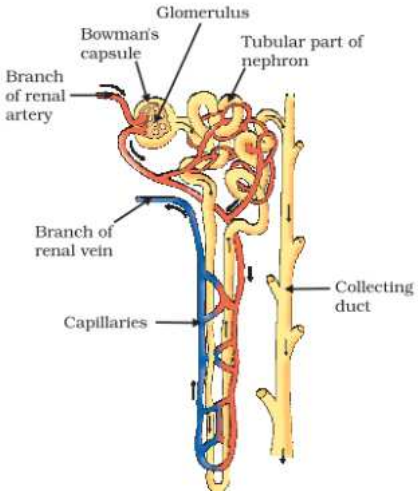
STRUCTURE OF A NEURON



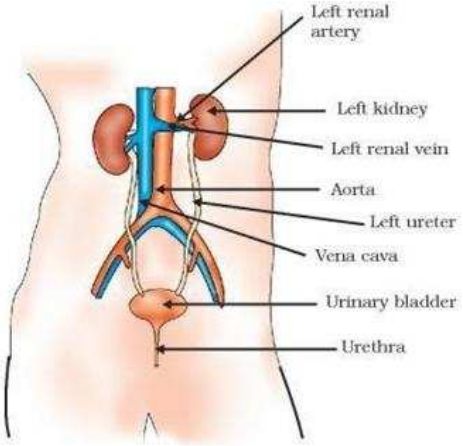
LS OF FLOWER



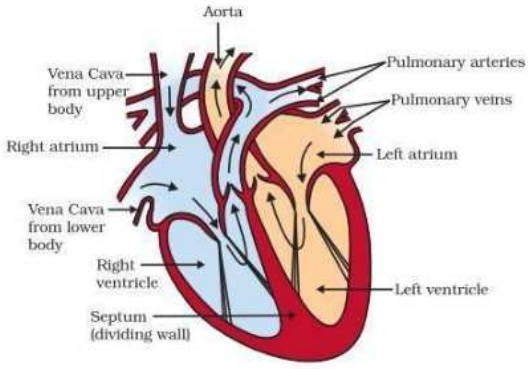
HUMAN ALIMENTARY CANAL / HUMAN DIGESTIVE SYSTEM



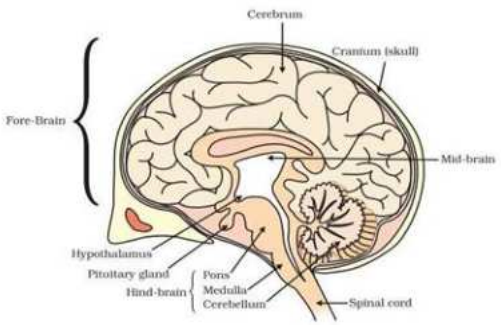
STRUCTURE OF A NEPHRON



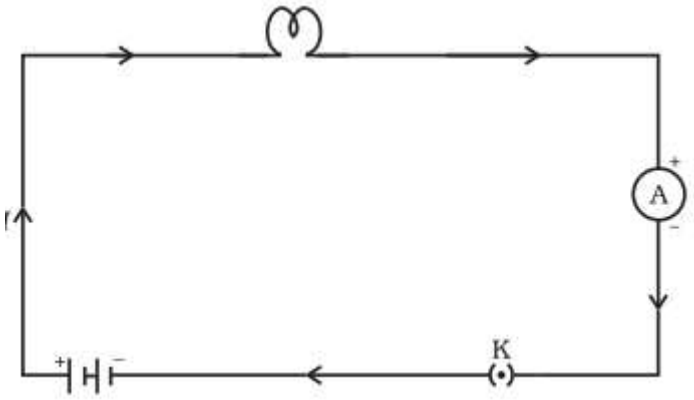
HUMAN EXCRETORY SYSTEM



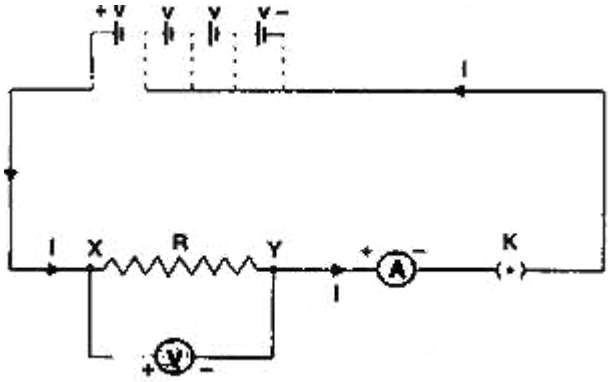
STRUCTURE OF HUMAN HEART



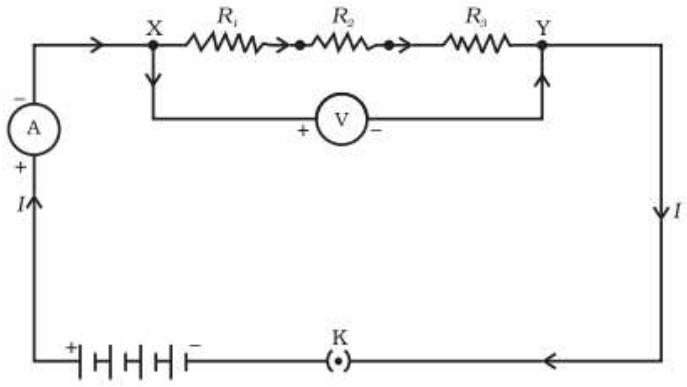
STRUCTURE OF HUMAN BRAIN



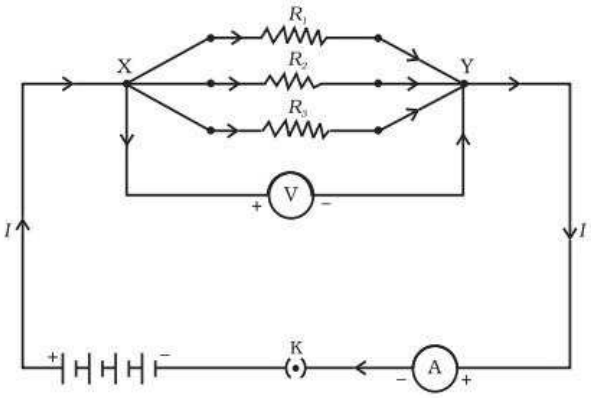
A SCHEMATIC DIAGRAM OF AN ELECTRIC CIRCUIT



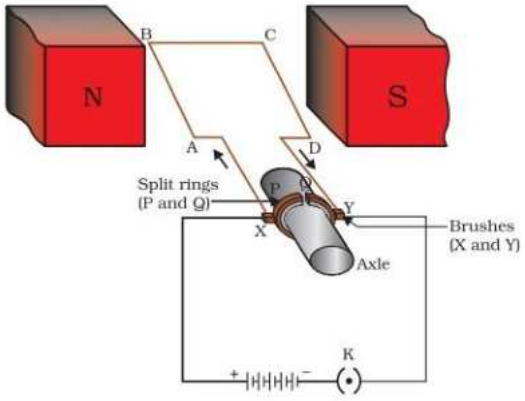
ELECTRIC CIRCUIT FOR STUDYING OHM'S LAW



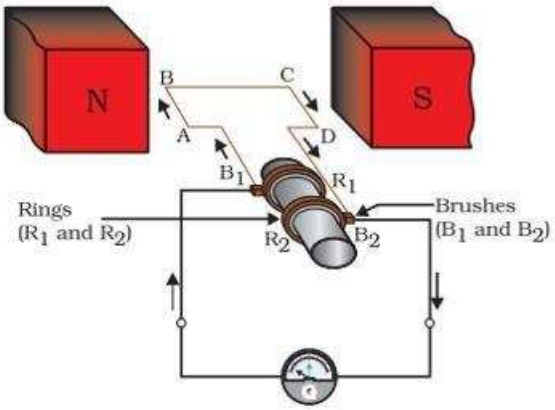
RESISTORS IN SERIES



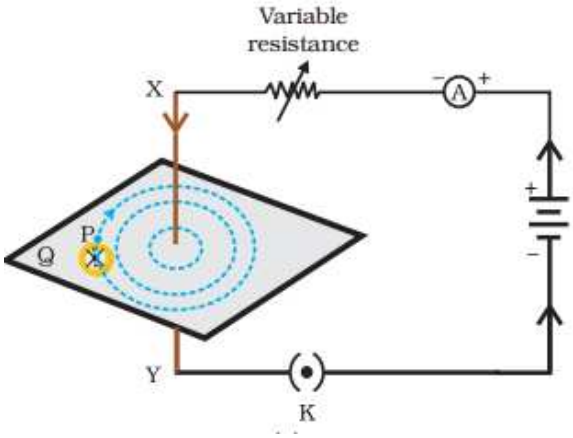
RESISTORS IN PARALLEL



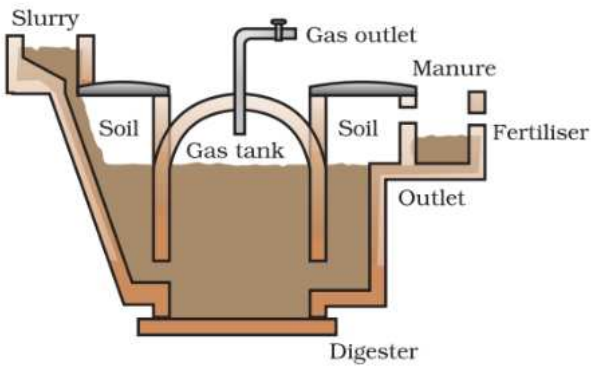
A SIMPLE ELECTRIC MOTOR



ELECTRIC GENERATOR



PATTERN OF MAGNETIC FIELD AROUND A STRAIGHT CONDUCTING WIRE.



SCHEMATIC DIAGRAM OF BIO-GAS PLANT

SYMBOLS OF SOME COMMONLY USED COMPONENTS IN CIRCUIT DIAGRAMS

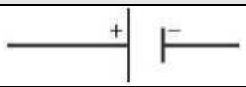
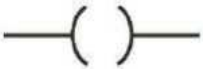
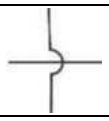
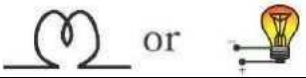
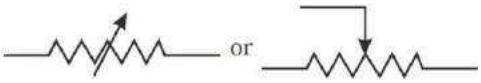
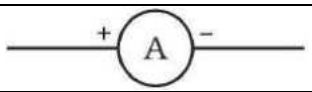
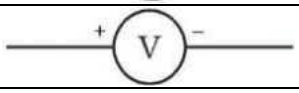
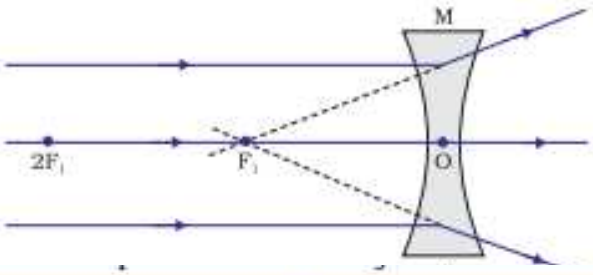
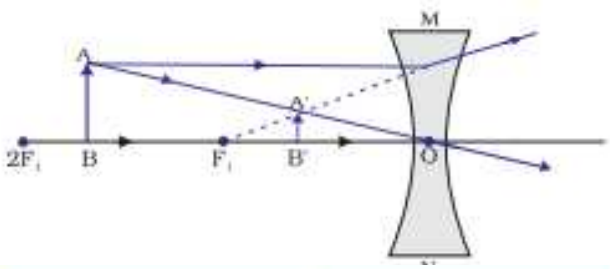
Sl No	Components	Symbols
1.	An electric cell	
2.	A battery or a combination of cells	
3.	Plug key or switch (open)	
4.	Plug key or switch (closed)	
5.	A wire joint	
6.	Wires crossing without joining	
7.	Electric bulb	
8.	A resistor of resistance *R*	
9.	Variable resistance or rheostat	
10.	Ammeter	
11.	Voltmeter	

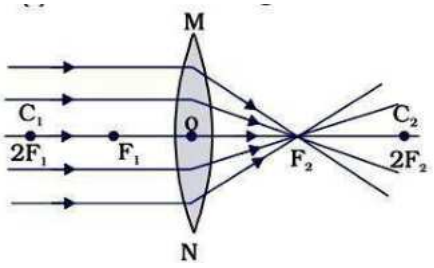
IMAGE FORMATION BY CONCAVE LENS



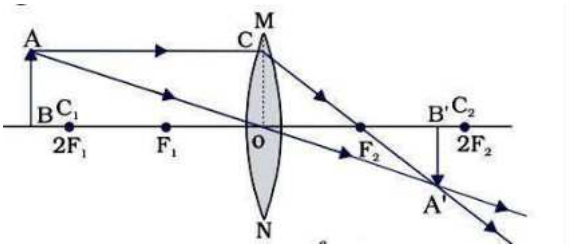


Position of the object	Position of the image	Relative size of the image	Nature of the image
At infinity	At focus F_1	Highly diminished, point-sized	Virtual and erect
Between infinity and optical centre O of the lens	Between focus F_1 and optical centre O	Diminished	Virtual and erect

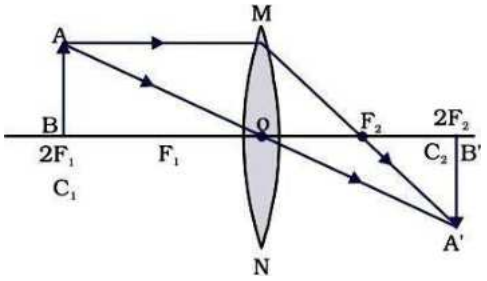
IMAGE FORMATION BY CONVEX LENS



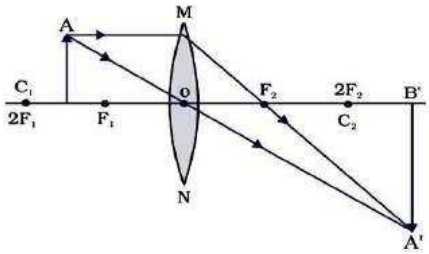
Object is at infinity.



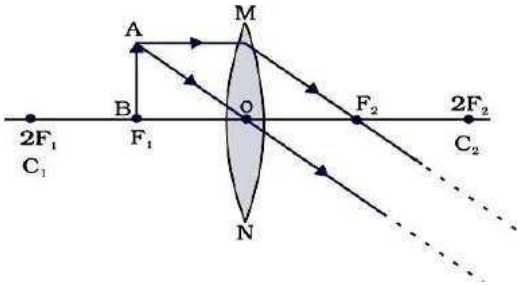
Object is beyond $2F_1$



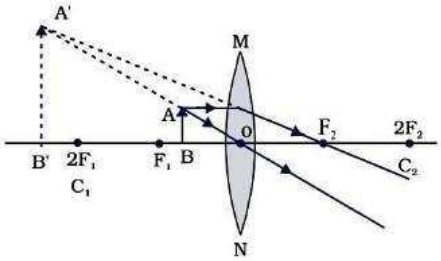
Object is at $2F_1$



Object is in between F_1 and $2F_1$



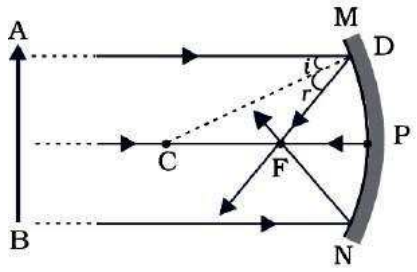
Object is at the focus (F_1).



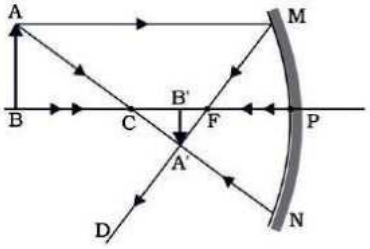
Object is in between Optical centre O and focus F_1

Position of the object	Position of the image	Relative size of the image	Nature of the image
At infinity	At focus F_2	Highly diminished, point-sized	Real and inverted
Beyond $2F_1$	Between F_2 and $2F_2$	Diminished	Real and inverted
At $2F_1$	At $2F_2$	Same size	Real and inverted
Between F_1 and $2F_1$	Beyond $2F_2$	Enlarged	Real and inverted
At focus F_1	At infinity	Infinitely large or highly enlarged	Real and inverted
Between focus F_1 and optical centre O	On the same side of the lens as the object	Enlarged	Virtual and erect

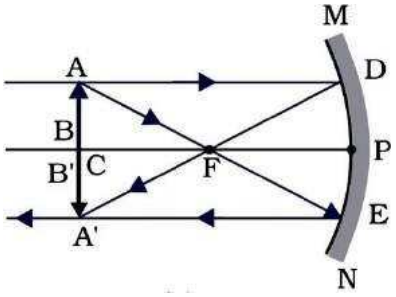
IMAGE FORMATION BY CONCAVE MIRROR



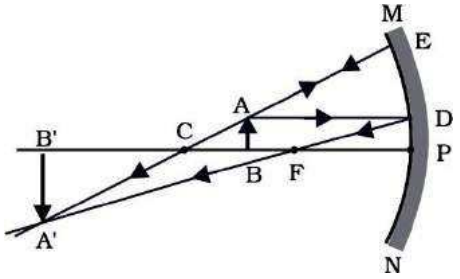
Object is at infinity.



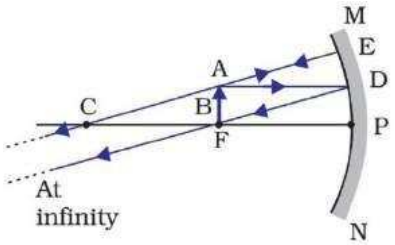
Object is beyond the centre of curvature(C)



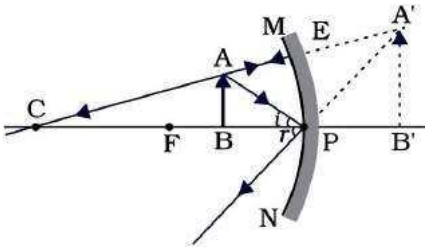
Object is at the centre of curvature(C)



Object is in between focus(F) and centre of curvature(C)



Object is at the focus(F).



Object is in between P and F

Position of the object	Position of the image	Size of the image	Nature of the image
At infinity	At the focus F	Highly diminished, point-sized	Real and inverted
Beyond C	Between F and C	Diminished	Real and inverted
At C	At C	Same size	Real and inverted
Between C and F	Beyond C	Enlarged	Real and inverted
At F	At infinity	Highly enlarged	Real and inverted
Between P and F	Behind the mirror	Enlarged	Virtual and erect

2 IMPORTANT FORMULAE

Electric Charge:

Charge q on a body is always denoted by

$$Q = ne$$

Work Done:

Work done = Charge x Potential Difference

$$W = Q\,x\,V$$

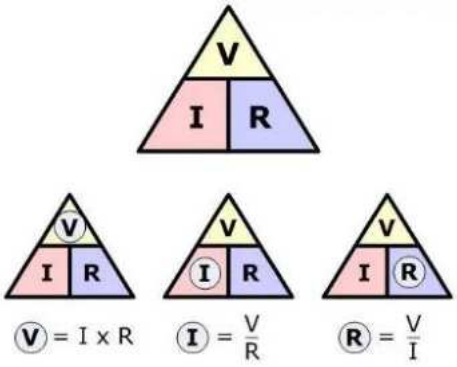
Electric Current: $Electric\ Current = \frac{Charge}{Time}$

$$I = \frac{Q}{t}$$

$$Q = I\,x\,t$$

Ohm's Law:

Potential Difference = Current x Resistance $V = I\,x\,R$



Resistance:

Resistance in terms of resistivity $R = \rho\frac{l}{A}$

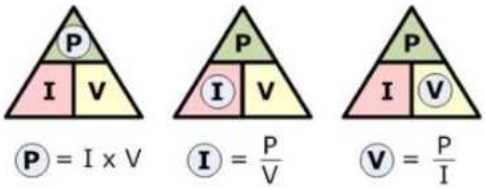
Resistance in series combination $Rs = R_1 + R_2 + R_3 + \cdots$

Resistance in parallel combination $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \cdots$

Electrical Power: $P = V \times I = I^2 R = \frac{V^2}{R}$

Power in Series $\frac{1}{P_S} = \frac{1}{P_1} + \frac{1}{P_2} + \frac{1}{P_3} + \cdots$

Power in parallel $P_P = P_1 + P_2 + P_3 + \cdots$



Mirror Formula: $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

Magnification (Both Lens & Mirror): $m = \frac{Height\ of\ the\ image\ (h')}{Height\ of\ the\ object\ (h)}$

$$m = \frac{h'}{h}$$

Magnification related to Object Distance (u) and Image Distance (v) (Mirror)

$$m = \frac{h'}{h} = -\frac{v}{u}$$

Magnification related to Object Distance (u) and Image Distance (v) (Lens)

$$m = \frac{h'}{h} = \frac{v}{u}$$

Refractive Index:

Refractive Index of Medium 2 with respect to medium 1:

$$n_{21} = \frac{Speed\ of\ Light\ in\ Medium\ 1}{Speed\ of\ Light\ in\ Medium\ 2} = \frac{v_1}{v_2}$$

Refractive Index of Medium 1 with respect to medium 2:

$$n_{12} = \frac{Speed\ of\ Light\ in\ Medium\ 2}{Speed\ of\ Light\ in\ Medium\ 1} = \frac{v_2}{v_1}$$

Absolute Refractive Index

$$n_m = \frac{Speed\ of\ Light\ in\ Air}{Speed\ of\ Light\ in\ Medium} = \frac{c}{v}$$

Lens Formula: $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

Power of a Lens: $P = \frac{1}{f}$

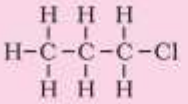
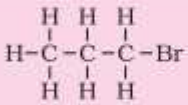
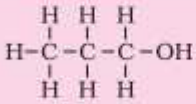
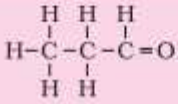
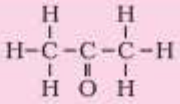
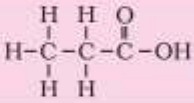
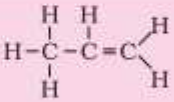
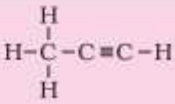
Radius of Curvature: $R = 2f$

Focal Length $f = \frac{R}{2}$

SL NO	PHYSICAL QUANTITY	SI UNIT	SYMBOL
1	Electricity	Kilo Watt Hour	kWh
2	Electric Current	Ampere	A
3	Electric Potential Difference	Volt	V
4	Electric Resistance	Ohm	Ω
5	Electric Charge	Coulomb	C
6	Electric Power	Watt	W
7	Power of a lens	Diopter	D

3 CHEMICAL STRUCTURES

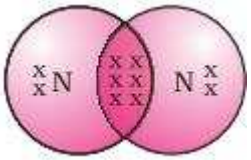
Nomenclature of organic compounds

Class of compounds	Prefix/Suffix	Example
1. Halo alkane	Prefix-chloro, bromo, etc.	 Chloropropane
		 Bromopropane
2. Alcohol	Suffix - ol	 Propanol
3. Aldehyde	Suffix - al	 Propanal
4. Ketone	Suffix - one	 Propanone
5. Carboxylic acid	Suffix - oic acid	 Propanoic acid
6. Alkenes	Suffix - ene	 Propene
7. Alkynes	Suffix - yne	 Propyne

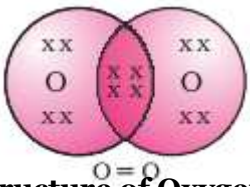
Some functional groups in carbon compounds

Hetero atom	Class of compounds	Formula of functional group
Cl/Br	Halo- (Chloro/bromo) alkane	—Cl, —Br (substitutes for hydrogen atom)
Oxygen	1. Alcohol	—OH
	2. Aldehyde	
	3. Ketone	
	4. Carboxylic acid	

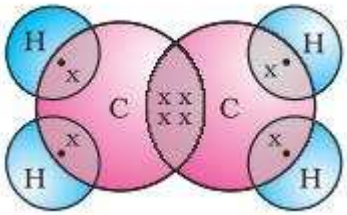
Structure of Hydrogen Molecule



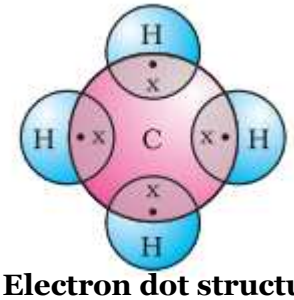
Structure of Nitrogen Molecule



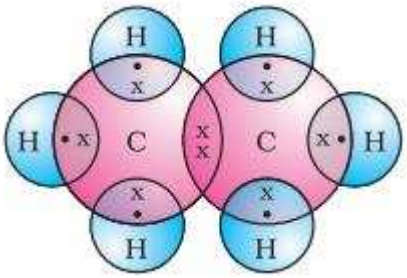
Structure of Oxygen Molecule



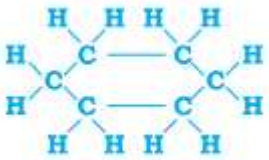
Electron dot structure For Ethene



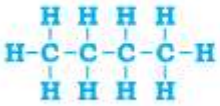
Electron dot structure For methane



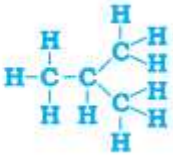
Electron dot structure For Ethane



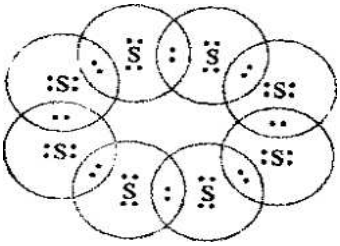
Structure of cyclohexane



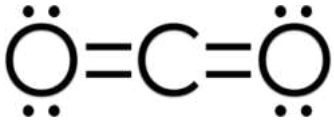
Structural Isomers of Butane



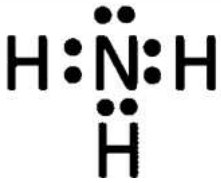
Structure of benzene



Electron Dot structure of Sulphur Molecule



Electron Dot structure of Carbon Dioxide



Electron Dot structure of Ammonia

$$Mg \longrightarrow Mg^{2+} + 2e^-$$

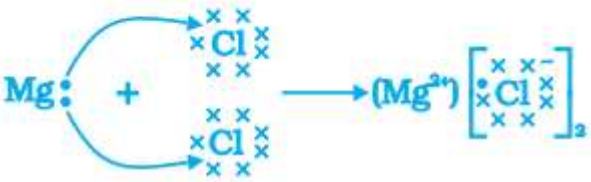
2,8,2 2,8

(Magnesium cation)

$$Cl + e^- \longrightarrow Cl^-$$

2,8,7 2,8,8

(Chloride anion)



Formation of Magnesium Chloride

$$Na \rightarrow Na^+ + e^-$$

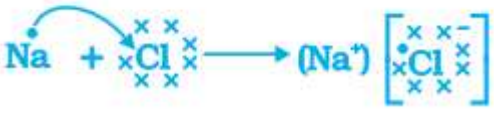
2,8,1 2,8

(Sodium cation)

$$Cl + e^- \rightarrow Cl^-$$

2,8,7 2,8,8

(Chloride anion)



Formation of Sodium Chloride

4 IMPORTANT LAWS

1. **Law of conservation of mass:**
   The law of conservation of mass states that mass can neither be created nor destroyed in a chemical reaction.
2. **Ohm's law:**
   At constant temperature, the potential difference across the ends of a conductor is directly proportional to the current flowing through a conductor.
   V=IR
3. **Joule's law of heating**:
   The heat produced in a resistor is directly proportional to the square of current for a given resistance and directly proportional to resistance for a given current and to the time for which the current flows through the resistor
   Heat produced H = I^2 Rt
4. **Right hand thumb rule:**
   A current carrying conductor is imagined to held in a right hand such that the thumb points the electric current, then the other the encircled fingers show the direction of magnetic field.
5. **Fleming's left-hand rule (Motor rule)**:
   The first three fingers of the left hand are arranged mutually perpendicular to each other, if the fore finger indicates the direction of the magnetic field, the middle finger indicates the direction of the electric current, then the thumb will point in the direction of motion of the conductor.
6. **Fleming's right hand rule (Dynamo rule)**: The first three fingers of the right hand are arranged mutually perpendicular to each other, if the fore finger indicates the direction of the magnetic field, the thumb indicates the direction of motion of the conductor, then the middle finger will indicates the direction of the induced current
7. **Dobereiner's law of triads:** The elements are arranged in the increasing order of their atomic masses in a group of three elements, the atomic mass of the middle element is the arithmetic mean of other two elements.
8. **Newland's law of Octaves:** The elements are arranged in the increasing order of their atomic masses every eighth element is a periodic function of the first element.
9. **Mendeleev's periodic law:**
   The properties of the elements are the periodic functions of their atomic masses.
10. **Modern periodic law:**
    The properties of the elements are the periodic functions of their atomic numbers.
11. **Laws of Reflection of light:**
    First Law: The angle of incidence is equal to the angle of reflection,
    Second Law: The incident ray, the normal to the mirror at the point of incidence and the reflected ray, all lie in the same plane.
12. **Laws of refraction of light:**
    First Law: The incident ray, the refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane.
    Second Law: The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a given colour and for the given pair of media. This law is also known as **Snell's law of refraction**. $\frac{\sin i}{\sin r} = constant$
13. **Faraday's law**: The rate at which the magnetic flux linked with a coil change, produces the induced emf or current. More the rate, more the current and vice-versa.
14. **10% law**: There is only 10% flow of energy from one trophic level to the next higher level. Due to this energy loss, only 4 or 5 trophic levels are present in each chain. It is known as 10% law.

5 DIFFERENCES OF CONCEPTS

Saturated Hydrocarbons	Unsaturated Hydrocarbons
These have single bond in between carbon atoms.	These have double or triple bond in between carbon atoms.
Are less reactive.	More reactive
Example: Alkanes and cycloalkanes	Example: Alkenes, alkynes
Homologous Organs	**Analogous Organs**
These are the organs which have common origin but perform different functions.	These are the organs which have different origin but perform similar functions.
Ex: Wings of birds and Forearms of humans	Ex: Wings of bat and wings of butterfly
Oxidation	**Reduction**
Addition of oxygen is called oxidation.	Removal of oxygen is called Reduction.
Loss electrons takes place.	Gain of electrons takes place.
It is the process of Removal of hydrogen	It is the process of addition of hydrogen
Arteries	**Veins**
These carry blood away from the heart.	These carry blood towards the heart.
Arteries have thick walls without valves	Veins have thin walls and have valves
Concave mirror	**Convex mirror**
These are converging mirrors	These are diverging mirrors
Inner surface acts as reflecting surface.	Outer surface acts as reflecting surface.
Produces real and virtual image	Produce only virtual images
Concave lens	**Convex lens**
It is thin in the middle and thick at the edges	It is thick in the middle and thin at the edges
These are diverging lens	These are converging lens.
Always produce virtual images.	It produces both real and virtual images.

AC dynamo	DC Dynamo
Produce Alternating current	Produces direct current.
Armature rotates with Slip rings	Armature rotates with split rings
The direction of the current changes in every half revolution.	The direction of the current does not change.
Corrosion	**Rancidity**
The metals are long time exposer to moisture or acids it become corroded.	The process of oxidation of oils which produce foul smell.
Ex: Rusting of iron	Ex: Oxidation of oils and fats.
Exothermic reactions	**Endothermic reactions**
The reaction in which heat is liberated.	The reaction in which heat is absorbed.
Ex: Digestion of food	Ex: Melting of ice.
Motor	**Generator / Dynamo**
It is a device which converts electrical energy into mechanical energy	It is a device which converts mechanical energy into electrical energy
It uses electricity	It generates electricity
Works on the principle of motor rule (Fleming's left-hand rule)	Works on the principle of dynamo rule (Fleming's right-hand rule)
Biodegradable substances	**Non-biodegradable substances**
The substances which are degraded by the action of microorganism	The substances which cannot degraded by the action of microorganism
Does not cause the pollution	cause the pollution
Examples: Kitchen waste, Cow dung	Examples: Plastics, Chemicals
Acquired traits	**Inherited traits**
developed during the lifetime of an individual.	Characteristics transmitted from parent to offspring.
Cannot be passed on to progeny	Can be passed on to progeny
Doesn't bring change in DNA of germ cells.	Bring changes in DNA of germ cells.
Ex, Dancing ability in man	Ex: Skin color in man

Voltmeter	Ammeter
Used to measure the potential difference,	Used to measure the current.
Connected in parallel in the electric circuit.	Connected in series in the electric circuit.
Has high resistance.	Has low resistance.
Renewable/Inexhaustible	**Non- Renewable/exhaustible**
They are also called inexhaustible	They are also called exhaustible
They are Pollution free.	They are Pollutant.
They are Abundant	They are less quantity.
e.g., sun, wind, water.	e.g., fossil fuels-petrol, coal.
Series Circuit	**Parallel Circuit**
When resistors are joined from end to end, it is called in series.	The combination of resistors in which resistors are connected together between two points.
The current through the circuit remains the same.	The current through the circuit is the sum of currents through each branch of the circuit.
Equivalent resistance of the circuit is the sum of individual resistances.	The reciprocal of equivalent resistance of the circuit is the sum of reciprocal of the individual resistances.

6 BALANCED CHEMICAL EQUATIONS

1. Between Zinc and Sulphuric Acid (**Displacement Reaction**)

   $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$

2. Rusting of Iron

   $3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$

3. Hydrogen + Chlorine → Hydrogen chloride (**Combination Reaction**)

   $H_2 + Cl_2 \rightarrow 2HCl$

4. Barium chloride + Aluminium sulphate → Barium sulphate +Aluminium chloride (**Double Displacement**)

   $Al_2(SO_4)_3 + 3BaCl_2 \rightarrow 2AlCl_3 + 3BaSO_4$

5. Sodium + Water → Sodium hydroxide + Hydrogen

   $2Na + 2H_2O \rightarrow 2NaOH + H_2$

6. Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride. (**Double Displacement)**

   $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$

7. Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water (**Neutralisation Reaction**)

   $NaOH + HCl \rightarrow NaCl + H_2O$

Combination Reaction

8. Calcium oxide reacts vigorously with water to produce slaked lime (calcium hydroxide) releasing a large amount of heat

   $\underset{\text{(Quick lime)}}{CaO(s)} + H_2O(l) \rightarrow \underset{\text{(Slaked lime)}}{Ca(OH)_2(aq)} + \text{Heat}$

9. Burning of coal

   $C(s) + O_2(g) \rightarrow CO_2(g)$

10. Formation of water from $H_2(g)$ and $O_2(g)$

    $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$

Decomposition Reaction

11. Electrolytic Decomposition of water:

    $2H_2O \rightarrow 2H_2 + O_2$

12. Heating of limestone: **(Thermal Decomposition)**

    $\underset{\text{(Limestone)}}{CaCO_3(s)} \xrightarrow{\text{Heat}} \underset{\text{(Quick lime)}}{CaO(s)} + CO_2(g)$

13. Heating of Lead nitrate: (**Thermal Decomposition)**

$$\underset{\text{(Lead nitrate)}}{2Pb(NO_3)_2(s)} \xrightarrow{\text{Heat}} \underset{\text{(Lead oxide)}}{2PbO(s)} + \underset{\text{(Nitrogen}}{4NO_2(g)} + \underset{\text{(Oxygen)}}{O_2(g)}$$

14. Heating of Ferrous sulphate- (**thermal decomposition**)

$$\underset{\text{(Ferrous sulphate)}}{2FeSO_4(s)} \xrightarrow{\text{Heat}} \underset{\text{(Ferric oxide)}}{Fe_2O_3(s)} + SO_2(g) + SO_3(g)$$

Displacement Reaction

15. Iron has displaced or removed another element, copper, from copper sulphate solution
Lead displaces copper (least reactive metal) from its salt:
Other Examples of Displacement Reaction:

$$Fe(s) + \underset{\text{(Copper sulphate)}}{CuSO_4(aq)} \rightarrow \underset{\text{(Iron sulphate)}}{FeSO_4(aq)} + Cu(s)$$

16. Zinc displaces copper (least reactive metal) from its salt.

$$Zn(s) + \underset{\text{(Copper sulphate)}}{CuSO_4(aq)} \rightarrow \underset{\text{(Zinc sulphate)}}{ZnSO_4(aq)} + Cu(s)$$

17. Lead displaces copper (least reactive metal) from its salt.

$$Pb(s) + \underset{\text{(Copper chloride)}}{CuCl_2(aq)} \rightarrow \underset{\text{(Lead chloride)}}{PbCl_2(aq)} + Cu(s)$$

Double Displacement Reaction

18. Precipitation Reaction

$$\underset{\text{(Sodium sulphate)}}{Na_2SO_4(aq)} + \underset{\text{(Barium chloride)}}{BaCl_2(aq)} \rightarrow \underset{\text{(Barium sulphate)}}{BaSO_4(s)} + \underset{\text{(Sodium chloride)}}{2NaCl(aq)}$$

Oxidation and Reduction

19. Copper oxide formation:

$$2Cu + O_2 \xrightarrow{\text{Heat}} 2CuO$$

$$CuO + H_2 \xrightarrow{\text{Heat}} Cu + H_2O$$

20. Reaction of Manganese oxide with Hydrochloric acid - Redox reaction

$$MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$$

21. Reaction of Zinc oxide and Carbon

$$ZnO + C \rightarrow Zn + CO$$

22. Photolytic decomposition of silver bromide and silver chloride

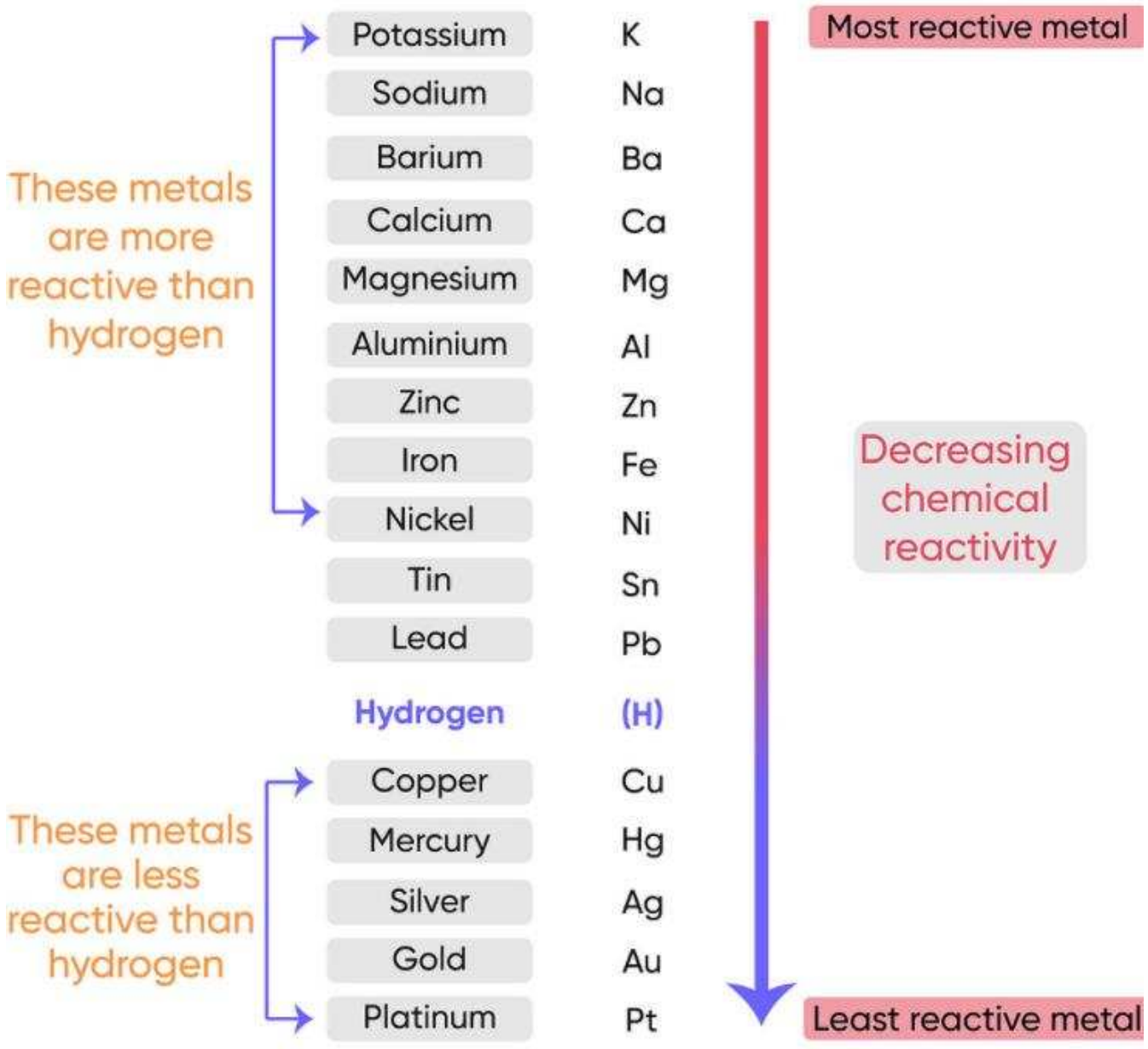
$$2AgCl(s) \xrightarrow{\text{Sunlight}} 2Ag(s) + Cl_2(g)$$

$$2AgBr(s) \xrightarrow{\text{Sunlight}} 2Ag(s) + Br_2(g)$$

23. Burning of natural gas
(Exothermic Reaction)

$$CH_4(g) + 2O_2(g) \rightarrow CO_2(g) + 2H_2O(g)$$

7 REACTIVITY SERIES



REACTIVITY OF SOME METALS ARE GIVEN IN DESCENDING ORDER

K › Na › Ca › Mg › Al › Zn › Fe › Pb › Cu

8 USES OF CHEMICAL COMPOUNDS

Sodium carbonate (washing soda) Na_2CO_3:

- It is largely used in production of detergents and soaps.
- It is used in the manufacturing of glass.
- It is used in the production of rayon polymers.
- It is used in water softening

Sodium hydrogen carbonate (baking soda) Na_2HCO_3:

- Used in cooking: people use baking soda in baking.
- Pest Control- Sodium bicarbonate is an effective way to control fungal growth.
- Fire extinguisher- People use Sodium bicarbonate to extinguish small grease or electrical fires by throwing it over the fire.
- Used as an antacid

Calcium oxychloride (Bleaching Powder) CaOCl2:

- Used as an oxidizing agent in chemical industries.
- Used for disinfection of drinking water.
- Used for bleaching of washed clothes in the laundry.
- Used for bleaching wood pulp in the paper manufacturing industry.
- Used as a bleaching agent in the textile industry for bleaching cotton and linen.

Plaster of Paris (POP) $CaSO_4.\frac{1}{2}H_2O$:

- Used in making casts and patterns for molds and statues.
- Used as the cement in ornamental casting and for making decorative materials.
- Used as a fireproofing material and for making chalks.
- Used in hospitals for immobilizing the affected part in case of bone fracture or sprain.

9 HORMONES & THEIR FUNCTIONS

ENDOCRINE GLANDS AND THEIR SECRETIONS

GLAND	HORMONE	FUNCTION OF THE HORMONE
Hypothalamus	Releasing hormones	» Stimulates pituitary gland to release hormones. EX: Growth hormone releasing factor stimulates pituitary gland to release GH.
Pituitary gland	Growth Hormone (GH)	» Stimulates growth & development of the body.
Thyroid gland	Thyroxine	» Regulates carbohydrate, protein & fat metabolism for balanced growth.
Pancreas	Insulin	» Regulates blood sugar level.
Adrenal gland	Adrenaline	» Prepares body to cope with emergency situations.
Testes (In male)	Testosterone	» Changes during puberty. » Development of male sex organs, behavior etc.
Ovaries (In female)	Oestrogen	» Changes during puberty. » Development of female sex organs, » Regulates menstrual cycle, etc.

PLANT HORMONES AND THEIR FUNCTIONS

Plant Hormones	Functions
Auxins	» Regulates growth in plants. » Helps the cells to grow longer.
Gibberellins	» Help in the growth of the stem.
Cytokinin	» Promote cell division
Abscisic acid	» Inhibits growth. Causes wilting of leaves.

10 IMPORTANT ONE MARK QUESTIONS

1. **Combination Reaction**: These are the reactions in which a product is formed by combining two or more reactants.
2. **Decomposition Reaction**: These are the reactions in which single reactant breaks down to give simpler products.
3. **Displacement Reaction**: These are the reactions in which a more reactive element displaces a less reactive element from its compound.
4. **Double Displacement Reaction**: These are the reactions in which there is an exchange of ions between the reactants.
5. **Oxidation:** If a substance gains oxygen during a reaction, it is said to be oxidised. Such reaction is called oxidation.
6. **Reduction**: If a substance loses oxygen during a reaction, it is said to be reduced. Such reaction is called reduction.
7. **Corrosion:** It is a process by which a metal is attacked by substances such as moisture, acids, etc.
   E.g. black coating on silver, green coating on copper.
8. **Rancidity:** When fats and oils are oxidized, they become rancid and their smell and taste change.
9. **pH Scale:**
   A scale for measuring H+ ion concentration in a solution is called pH scale.
10. **Catenation:** It is the ability of carbon to form bonds with other atoms of carbon, giving rise to large molecules.
11. **Functional groups:** Heteroatoms & the group containing these give specific properties to the compound, regardless of the length and nature of the chain are called functional groups.
12. **Isotope**: Isotopes of an element have similar chemical properties, but different atomic masses.
13. **Groups**: The Modern Periodic Table has 18 vertical columns. They are known as groups.
14. **Transpiration**: The loss of water vapour from the aerial parts (mainly stomata of leaves) of the plant is known as transpiration.
15. **Periods**: The Modern Periodic Table has 7 horizontal rows. They are known as periods.
16. **Placenta**: This is a disc of a special tissue embedded in the uterine wall. It connects foetus to mother.
17. **Genetic drift**: Accidental change in the frequency of some genes in small populations is called genetic drift.
18. **Speciation:** Speciation is an evolutionary process of formation of new species.
19. **Fossil:** Fossil are preserved traces of organisms lived in the past. They help to understand about extinct species.
20. **Water of crystallization:** Water of crystallisation is the fixed number of water molecules present in one formula unit of a salt.
21. **Isomerism:** The phenomenon in which the compounds having the same molecular formula but different structural formulae is called Isomerism.
22. **Evolution:** The change in inherited traits in biological population over subsequent generations is called evolution.
23. **Fossils:** The preserved remains of animals or plants or other organisms from the distant past are called fossils.

24. **Strong acid:** An acid which ionizes completely in water to give more H^+ ions is called a strong acid.

25. **Strong base:** A base which ionizes completely in water to give more OH^- ions is called a strong base.

26. **Principal focus of a concave mirror:** A beam of light parallel to principal axis after reflection from a concave mirror converges to a point on the principal axis. This point is called Principal focus of a concave mirror

27. **Principal focus of a convex mirror:** A beam of light parallel to principal axis after reflection from a convex mirror appear to diverge from a point on the principal axis. This point is called Principal focus of a convex mirror.

28. **Focal Length (f):** The focal length of a spherical mirror is the distance between its pole and Principal focus.

29. **Power of a lens:** The power of a lens is defined as the reciprocal of its focal length.

30. **Dioptre:** 1 dioptre is the power of a lens whose focal length is 1 metre.

31. **Acid rain:** When the pH value of rain water is less than 5.6, then it is called acid rain.

32. **Phototropism:** The growth in a plant part in response to light is called Phototropism

33. **Hydrotropism:** The growth in a plant part in response to water is called Hydrotropism.

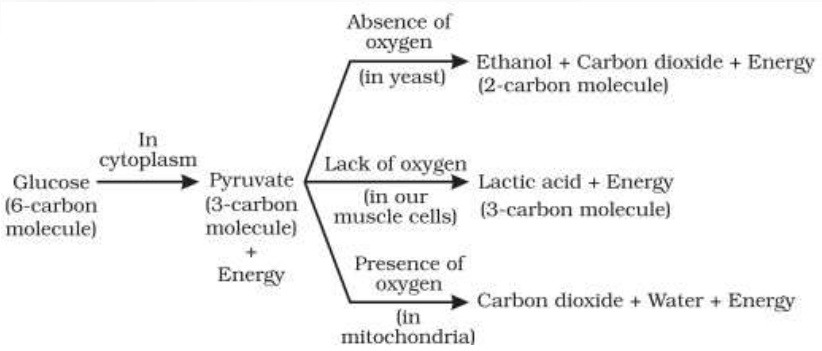
34. **Geotropism:** The movement/ growth of plant in response towards gravity is called Geotropism

35. **Chemotropism:** The growth movement in a plant part in response to chemicals is called Chemotropism

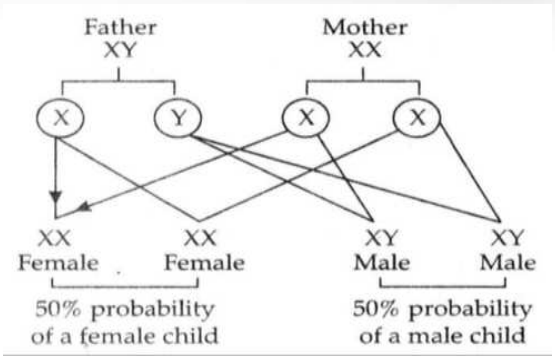
36. **Synapse:** The gap between two successive neurons is called a synapse.

37. **Neutralization reaction:** The reaction between an acid and a base to give salt and water is called neutralization reaction.

11 SOME IMPORTANT CONCEPTS TO FOCUS ON



BREAK-DOWN OF GLUCOSE BY VARIOUS PATHWAYS



SEX DETERMINATION IN HUMAN BEINGS

IONIC COMPOUNDS

The compounds formed by the transfer of electrons from a metal to a non-metal are called Ionic compounds or electrovalent compounds.

Properties of ionic Compounds

- **Physical nature**: They are solid and hard, generally brittle.
- **Melting and Boiling Point**: They have high melting and boiling point.
- **Solubility**: Generally soluble in water and insoluble in solvents such as kerosene, petrol etc.
- **Conduction of electricity**: Ionic compounds conduct electricity in molten and solution form but not in solid state.

PREVENTION OF RUSTING:

- The iron articles should be painted.
- The machine parts should be oiled and greased.
- Galvanized iron pipes are used for water supply.
- Iron can be coated with chromium to prevent rusting

PARTS OF THE BRAIN AND ITS FUNCTIONS:

Fore brain:

- Thinking part of the brain.
- Control the voluntary actions.
- Store information (Memory).
- Receives sensory impulses from various parts of the body and integrate it.
- Centre associated with hunger.

Mid-brain:

Controls involuntary actions, such as: vision, hearing, motor control, sleep, temperature regulation, etc.

Hind-brain: It has three parts:

i) Cerebellum: It is responsible for precision of voluntary actions and maintaining the posture and balance of the body. e.g., picking pen.

ii) Medulla: Controls involuntary actions e.g., blood pressure, salivation, vomiting.

PLACENTA

The disc of a special tissue embedded in the uterine wall which connects foetus to mother.

Functions of placenta:

- The embryo gets nutrition from the mother's blood.
- Transports glucose & oxygen from mother to embryo.
- Removes wastes from embryo into mother's blood.

MALE REPRODUCTIVE SYSTEM: STRUCTURES & THEIR FUNCTIONS

- **Testes** - produces sperms and secretes testosterone to regulate the secondary sexual characters in boys
- **Vas deferens** - Deliver sperms to urethra
- **Prostate glands and seminal vesicles**- secrete fluid for easy transport of sperms and provides nutrition
- **Penis**- helps in the ejaculation of sperms to female body.

CONTRACEPTIVE METHODS TO AVOID PREGNANCY

- **Mechanical barriers:** They prevent the meeting of sperm with egg.
  E.g. Condoms or coverings worn in the vagina.
- **Oral pills:** They change the hormonal balance of the body. So eggs are not released and fertilisation does not occur. It has side effects due to hormonal imbalance.
- **Loop or copper-T:** They are placed in uterus to prevent pregnancy. They cause side effects due to irritation of the uterus.
- **Surgical methods:** Here, fertilisation is prevented by blocking gamete transport.
  In male, **vas deferens** is blocked to prevent sperm transfer.
  In female, **fallopian tube** is blocked to prevent the egg reaching the uterus.

CHARACTERISTICS OF FIELD LINES

- Field lines arise from North pole and end into South pole of the magnet.
- Direction of field lines inside a magnet is from South to North.
- Field lines are closed curves.
- Field lines are closer in stronger magnetic field.
- Field lines never intersect each other.

PRINCIPLE OF AN ELECTRIC MOTOR:

A motor works on the principle that when a rectangular coil is placed in a magnetic field and current passes through it, a force acts on the coil which rotates it continuously.

PRINCIPLE OF AN ELECTRIC GENERATOR:

- It is based on the principle of electromagnetic induction.
- It states that "an induced current is produced in a coil placed in a region where the magnetic field changes with time.

CHARACTERISTICS OF A GOOD FUEL:

- High calorific value (give more heat per unit mass).
- Burn without giving out any smoke or harmful gases.
- Proper ignition temperature.
- Easy to handle, safe to transport.
- Convenient to store.
- Burn smoothly
- Cheap and Eco-Friendly.

FACTORS ON WHICH RESISTANCE OF A CONDUCTOR DEPEND:

The resistance of the conductor depends on the following factors:

- The temperature of the conductor
- The cross-sectional area of the conductor
- Length of the conductor
- Nature of the material of the conductor.

BLOOD VESSELS AND THEIR FUNCTIONS

Arteries:

- They carry blood away from heart.
- The arteries have thick, elastic walls.

Veins:

- They collect the blood from different organs and bring it back to the heart.
- They have no thick walls
- They have valves to flow the blood only in one direction.

Capillaries:

- The smallest vessels having walls which are one-cell thick.
- Through this wall, exchange of material between blood and surrounding cells takes place.

BLOOD CELLS AND THEIR FUNCTIONS

- **Plasma**: transports food, O_2, CO_2 and nitrogenous wastes.
- **RBC**: Helps in transport of oxygen
- **WBC**: Fights against germs.
- **Platelets**: helps in clotting of blood

PHYSICAL PROPERTIES OF METALS

- **Metallic lustre** : The metals have shining surface.
- **Hardness** : Metals are generally hard.
- **Malleability** : It is the ability of metals to be beaten into **thin sheets.**
- **Ductility** : It is the ability of metals to be drawn into **thin wires.**
- **Good Conductor** : Metals are good conductors of heat and electricity.
- **Sonorous** : It is the ability to produce sound on striking hard surface.

OZONE LAYER

- Ozone at the higher levels of the atmosphere, shields the earth surface from dangerous **ultraviolet (UV)** radiation from the Sun.
- UV radiation causes harmful effects such as skin cancer.

Formation of Ozone Layer:

- At the higher levels of the atmosphere, the higher energy UV radiations split some O_2 into free oxygen (O) atoms. They combine with O_2 to form ozone (O_3).

$$O_2 \xrightarrow{UV} O + O$$

$$O + O_2 \rightarrow O_3 \quad \text{(Ozone)}$$

Ozone Depletion:

- It is due to chemicals like **chlorofluorocarbons (CFCs)**
- **CFCs** are produced while using refrigerants and in fire extinguishers.

ADVANTAGES OF A.C OVER D.C

- Cost of generator of A.C is much less than that of D.C.
- A.C can be easily converted to D.C.
- A.C can be controlled by the use of choke which involves less loss of power whereas, D.C can be controlled using resistances which involves high energy loss.
- AC can be transmitted over long distances without much loss of energy.