

Important Application oriented Questions for SSC Public Examination

Uses of the concave mirrors.

- i. Dentists use this mirror to check the teeth.
- ii. In the microscopes,
- iii. As shaving mirror
- iv. In the preparation of solar cooker.

Uses of the convex mirrors.

- i. These mirrors are used as rear-view mirrors in vehicles,
- ii. At junctions of the roads,
- iii. In the shopping malls, at parking areas
- iv. At curved roads.

Uses of the concave lenses

- i. It is used to correct myopia
- ii. Flash lights

Uses of Convex lens

- i. It is used Microscope.
- ii. It is used as Camera lens
- iii. It is used to correct eye defect Hypermetropia in Eye glasses.

Uses of sodium hydroxide:

- i. used to de-greasing
- ii. Preparation of soaps and detergents.
- iii. Paper making
- iv. Artificial fiber

Uses of Bleaching Powder ($CaOCl_2$)

- i. It is used for bleaching cotton and linen in textile industry.
- ii. It is used for bleaching wood pulp in paper industry.
- iii. It is used for bleaching washed clothes in laundry.
- iv. It is used as an oxidizing agent in many chemical industries.
- v. It is used for disinfecting drinking water to make it free of germs.
- vi. It is used as a reagent in the preparation of chloroform.

Uses of Baking soda/Sodium Hydrogen Carbonate (NaHCO_3)

- i. Baking soda produces CO_2 which rises through bubbling dough into cake or bread. This results in making the cake and bread smooth and spongy.
- ii. Sodium hydrogen carbonate is also an ingredient in antacids.
- iii. It is also used as soda-acid in fire extinguishers.
- iv. It acts as mild antiseptic.

Washing Soda (or) Sodium carbonate (Na_2CO_3)

- i. Sodium carbonate is used in glass, soap and paper industries.
- ii. It is used in the manufacture of Sodium compounds such as borax.
- iii. Sodium carbonate can be used as a cleaning agent for domestic purposes.
- iv. It is used for removing permanent hardness of water.

Uses of Plaster of Paris ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$)

- v. It is used by doctors for supporting fractured bones in the right position.
- vi. It is used for making toys.
- vii. It is used for making materials for decoration and for making surfaces smooth.

Daily life examples of dispersion:

- i. After the rains we see rainbow in sky due to dispersion of light
- ii. When petrol/diesel mixed with water we can see different colors due to dispersion. Due to dispersion we can see different colors on soap bubble.
- iii. We can see different colors on CD/DVD due to dispersion.

Applications of specific resistance (Resistivity):

The value of resistivity determines the conductivity of materials.

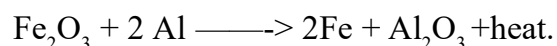
1. Metals like copper behave as good conductors used in preparing electric wires due to low resistivity.
2. The filament of an electric bulb is usually made of tungsten, because of its high resistivity and high melting point (3422°C).
3. The alloys like nichrome possess larger values of resistivity and this makes them suitable for use of heating elements in electric irons, electric toasters etc.

Applications of Faraday's law of electromagnetic induction:

1. During security check, people are made to walk through a large upright coil of wire which produces a weak AC (alternating) magnetic field. If we are carrying any significant quantities of iron, the magnetic flux linked with the large coil changes and the induced current generated in coil triggers an alarm.
2. The tape recorder which we use to listen to songs (or) record voices works on the principle of electromagnetic induction.
3. The principle of electromagnetic induction in the case of using ATM card when its magnetic strip is swiped through a scanner.
4. An induction stove works on the principle of electromagnetic induction.
5. Generators also work based on this rule.

Daily life applications of thermite reaction

The reaction of iron oxide (Fe_2O_3) with aluminium produces molten iron which is used to join railings of railway tracks or cracked machine parts.



This reaction is known as **thermite reaction**.

Daily life applications of Graphite

- i. The interaction between layers is weakened by the presence of water. This is the reason why it is easy to cleave graphite
- ii. So graphite is used as "lead" in pencils also as lubricant.
- iii. Graphite is a good conductor of electricity. (**Reason** : Delocalized π electron system)

Strength of Acids and Bases

The strength of acids or bases depends on the concentration of H^+ ions or OH^- ions produced in solution. This can be measured by pH value. 3

Plants and animals are pH sensitive

Living organisms can survive only in a narrow range of pH changes. When pH of rain water is less than 5.6, it is called acid rain. When acid rain flows in to the rivers the pH of the river water is lowered. The survival of aquatic life in such rivers becomes difficult.

pH in stopping tooth decay

The tooth decay starts when the pH of mouth is lower than 5.5. We use toothpaste, which is a base to neutralize the excess acid to prevent tooth decay.

pH in digestive system

Our stomach produces *HCl acid*, which helps in digestion of food without harming the stomach. During indigestion, we use bases called antacids. These antacids neutralize the excess acid in the stomach.

pH of the soil

Plants require a specific pH range for their healthy growth. It is necessary to find out the pH of the soil to use required fertilizers for the healthy growth of the plants.

Reason for blue color of the Sky

- i. The sunlight which is entering into the Earth's atmosphere will be scattered due to gases and dust particles.
- ii. The light color released due to scattering, depends on the size of the particles
- iii. The sizes of nitrogen and oxygen molecules in atmosphere are comparable to wavelength of blue color. So these particles are scattering centers of blue color.

So, the blue color scatters more and the sky appears as blue.

The reason for appearance of red color of Sun during Sunrise and at sunset

- i. The light from the sun needs to travel more distance in atmosphere during sunrise and sunset to reach your eye
- ii. Except red color light all colors scatter more and vanish. Before they reach you.
- iii. Due to less scattering of red color, it reaches our eye.
- iv. As a result sun appears red in color during sunrise and sunset

Why electrical appliances are connected in Parallel

- i. The electrical appliances in house-hold circuit are connected in parallel because if any appliance is switched off, the other appliances are not affected.
- ii. If they are connected in series, if one appliance is switched off all the other appliances will switch off.

Why electrical appliances are connected in Parallel

The headlights of a car are connected in parallel, because in parallel wiring both headlights get the power. If one light goes off the other will work.

Electric shock:

- i. Electric shock can be experienced when a potential difference exists between one part of the body and another part.
- ii. The electric shock is a combined effect of potential difference, electric current and resistance.
- iii. When a bird stands on a high voltage wire the potential difference does not exist between its legs because it stands on a single wire. Hence it does not feel any electric shock.

Electric Power

- i. The rate at which electric energy is consumed is termed as electric power. Electric power $P = \text{Work done} / \text{Time of flow of current}$

$$P = \frac{W}{t}$$
$$P = I^2 R \quad P = \frac{V^2}{R}$$

- ii. S.I unit of electric power is watt (W)
- iii. Generally power consumption expressed in bigger units of power like KiloWatt.
- iv. $1\text{kW} = 1000\text{W}$ Power also expressed in horsepower $1\text{HP} = 746$
- v. The consumption of electric energy is expressed in kiloWatt hour.
 $1 \text{ kiloWatt hour (kWh)} = 3.6 \times 10^6 \text{ J}$

Overloading:

- i. If the value of current flow goes above the required value of the circuit then the wire fails to bear the load of electric current. This is called overloading.
- ii. This leads to fire accidents.
- iii. To protect from overloading we use electric fuses in the household circuits.

Fuse:

- i. The fuse consists of a thin wire having a low melting point. Due to this, if the current in a circuit increases above a particular point, the fuse wire gets heated and melts.
- ii. A piece of wire made of lead and tin alloy is used in making a fuse.

Methods to prevent Corrosion:

- i. Corrosion can be prevented by
- ii. Painting the surface of metals
- iii. Oiling or greasing the surface.
- iv. Galvanization.
- v. Electroplating
- vi. Alloying