

## GENERAL SCIENCE AND ABILITY

### TEST - 1

#### Question - 2

(A) Give importance of the renewable energy resources with respect to environment and explain solar energy?

#### Renewable Energy Resources:

Renewable energy resources are 'natural' resources that can be replenished over a period of time and are a sustainable way to generate energy.

Here are some examples of the renewable energy resources

i- Solar Energy

ii- Wind Energy

iii- Tidal Energy

iv- Hydrothermal Energy

v- ~~or~~ Biofuel Energy

vi land fill gas Energy

## Importance of the renewable energy resources with respect to environment

Renewable energy resources play a crucial role in protecting the environment and mitigating climate change. Here are some of the importance of the renewable energy resources with respect to environment :-

### i- Reduce greenhouse gas emission

Renewable energy resources like solar energy, wind energy and tidal energy do not emit any of the pollutant including GHGs which are the major cause of global warming and climate change.

## ii- Reduces air pollution :-

Most of the renewable energy resources like solar energy, wind energy, tidal energy, hydro energy do not emit any of pollutant like oxides of sulphur and nitrogen. Thus, mitigating the health issues which are caused by pollution like respiratory disorders and lungs infections.

## iii- Conserve water Resources :-

Most renewable energy resources requires less water consumption to generate energy unlike traditional fossil fuels-based power plants that use major portion of water.

## iv- Protects Biodiversity:

Renewable energy resources helps to protect and conserve biodiversity and ecosystem which can be disturbed by the use of fossil

fuel & extraction.

## v- Enhances energy security:

Renewable energy resources can enhance energy security by reducing our reliance of on the imported fossil fuels.

## Solar Energy:

Solar energy is the energy generated by the sun's rays, either directly and indirectly and can be stored through different ways as an energy source.

## Types of Solar Energy:

Following are the types of solar energy:

### i- Photovoltaic Energy (PV):

This type of solar energy converts sunlight to generate electricity.

### ii- Solar Thermal Energy:

Here the solar energy as a heat

source is used to warm the water which then used to heat water or generating electricity.

### iii- Concentrated Solar Power (CSP):

This type of solar energy uses mirrors or lenses to focus sunlight onto a heat exchanger, generating steam to power a turbine.

### Benefits of solar energy:-

Following are the benefits of solar energy:

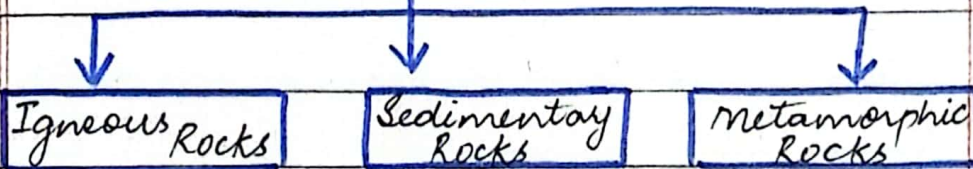
- It is a renewable & sustainable sources of energy, reduces reliance on fossil fuels.
- It is non-pollutant, releasing zero emittant.
- It allows individuals to generate their own energy reducing reliance on grid electricity.
- Solar energy systems requires minimum maintainence and have no fuel cost.

B- What are rocks? Give its types and describe the rock cycle.

## ROCKS

Rocks are the solid masses of the mineral materials. They can be composed of one or more minerals and can range from the size of a pebble to a massive boulders.

### Types of Rocks



These are the 'three' main types of the rocks:

#### I- Igneous Rocks:

These rocks are formed by the cooling and solidification of the magma (molten rock) from the Earth's interior. Examples are granite, basalt and Obsidian.

## II - Sedimentary Rocks:

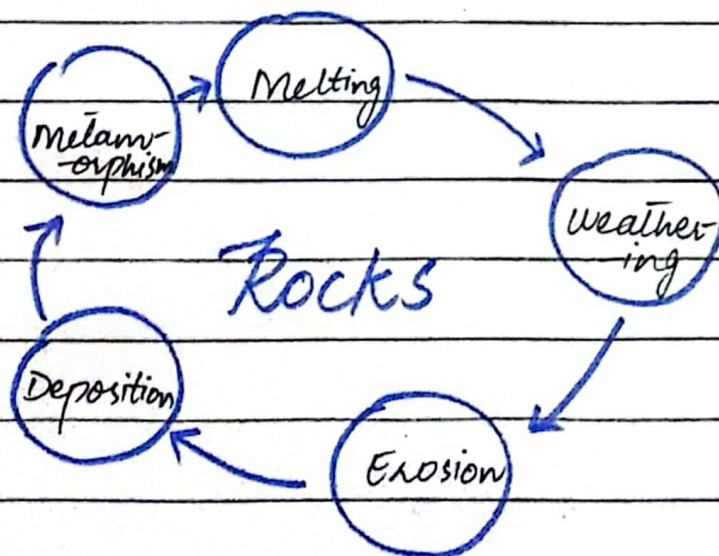
Sedimentary rocks are formed by the accumulation of sediments, such as sand, silt and clay. Examples are limestone, sandstone.

## III - Metamorphic Rocks:

These rocks are formed by the present rocks when they are subjected to high temperature and pressure, causing changes in their structure.

Examples: marble, slate and quartzite.

## Cycle of the rock formation



## Processes involved in cycle:

Following are the major processes that are involved in the rock cycle

### Melting:

It is the process of the melting of rocks to a molten magma present in the Earth's interior.

### Weathering:

It is the breakdown of the rocks into the sediments through the pressure of air, wind, water.

### Erosion:

The removal of sediments through natural forces like wind, air, water and ice.

### Deposition:

This is the accumulation and compression of the sediments to form a rock.

### Metamorphism: It is the

Change in the physical nature of the rock by the pressure of



air and temperature.

**C** - Differentiate between the saturated and unsaturated fats. Give the importance.

### Difference

#### Saturated Fats

##### Structure:

These are the fatty acids that have 'single bond' of carbon atoms between them.

##### Physical State:

They are 'solid' at the room temperature

##### Cholesterol level:

They are usually low density lipids (LDL).

#### Unsaturated Fats

##### Structure:

They have the fatty acids that have 'double or triple bond' of carbon between their atoms

##### Physical State:

They are 'liquid' at the room temperature.

##### Cholesterol level:

They are usually high density lipids (HDL)

## Saturated Fats

Occurrence: They can be found in butter, coconut oil etc.

## unsaturated Fats

Occurrence: They can be found in fish, palm oils, almond oils etc.

## Importance:

Saturated fats have importance over unsaturated fats as they are:

- 1- less toxic  $\rightarrow$  having low density lipids thus contributing less to the cholesterol level.
- 2- More dissolvable  $\rightarrow$  they can be dissolve easily at the body temperature and hence they cannot be accumulated in body as the fat.
- 3- Dietary suplliment  $\rightarrow$  saturated fats are the major portion of dietary supplements and source of energy.

D- Give a brief of water soluble vitamins

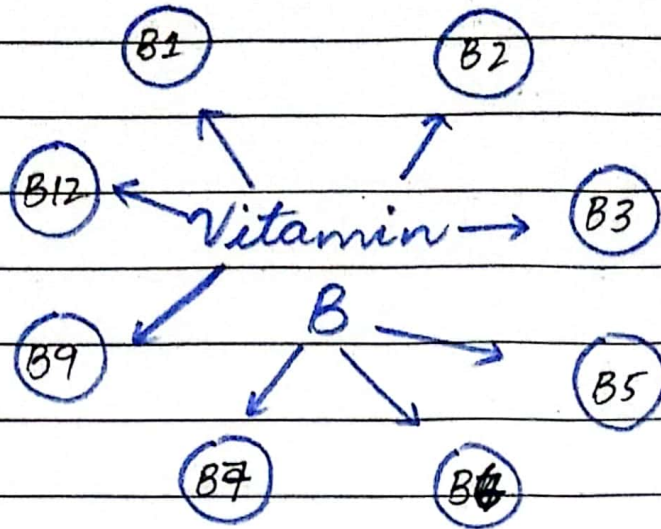
### ⇒ Water Soluble Vitamins

The vitamins that are dissolve in the water are called water soluble vitamins. These vitamins do not stored in the body and excess of it excretes out from the body through urine.

Types of water soluble vitamins:  
Water soluble vitamins mainly include 'nine' types of vitamins:

#### 1- Vitamin C (Ascorbic Acid)

Vitamin C is the most important water soluble vitamin. It is mostly found in citrus fruits and vegetables like orange, lemon. Guava is the major source of vitamin C. The deficiency of vitamin C causes Scurvy



### B1 (Thiamine)

Vitamin B1 found in the seeds legumes. It provides energy to the body. Deficiency of vit. B1 causes Beriberi

### B2 (Riboflavin)

It is present in the dairy products, green leafy. It improves vision and provide energy.

### B3 (Niacin)

It is found in meat, fish, grains. It improves skin health. Deficiency of vit. B3 causes Pellagra

### Vitamin B5

It is found in the grains, legumes, green leafy vegetables. It provides energy and improves immune system.

### Vitamin B6

It is found in meat, fishes. It helps in nerve functions and improves skin health.

## Question - 3

A - Write a short note on the vaccines.

### Vaccines :

Vaccines are the weakened, dead or the attenuated pathogens that are injected to the body to fight against the disease being treated.

The dead pathogens are mainly fight against the viral

infections.

### Discovery:

Vaccines were discovered by the Edward Jenner in 1796 when he was treating 'small pox'. He infected the boy with small pox pathogens the boy did not get affected but recovered from small pox. Through this method vaccine was discovered.

### Modern Technology:

In the present era, different methods are used to produce vaccines that can be fight against those disease that could be fatal in the past.

1- Recombinant DNA Technology is the modern technique of making vaccines in which an individuals DNA can be recombined with the healthy gene to produce

the desire product.

## ii- Biotechnology:

This field is also working on the vaccine production.

### Working of the vaccine:

When a weakened or dead pathogens enters to the body, antibodies form against the pathogens. These antibodies stays there and whenever the actual virus or pathogens enters the body, the already present antibodies fight against the actual pathogens & killed them. This is how the vaccines work.

### Examples:

Examples of the vaccines are Polio vaccine, influenza vaccine, COVID-19 vaccine.

D- Write a short note on the carbohydrates.

### Carbohydrates:

Carbohydrates are simply the 'sugars'. This is the ~~org~~ major group of the hydrocarbons having aldo-sugar and keto-sugar groups.

### Types of carbohydrates:

Following are the types of carbohydrates:

#### i- Monosaccharides:

'Saccharide' meaning sugar & 'mono' means 'one'. It involves the single unit of the sugar having 2-9 carbon atoms. like glucose, fructose.

#### ii- Disaccharides

It includes two units of monosaccharide to form a sugar



molecule. Such as maltose which is two units of fructose, galactose which is the combination of glucose and fructose.

### III - Polysaccharides:

'Poly' means many. It involves upto thousands units of monosaccharides that forms a macromolecule. Such as Sucrose.

### Occurrence of Carbohydrates:

Major sources of carbohydrates are:

Food: Sugars, potato, vegetables grains, wheat, rice.

Dietary Dairy products like milk, butter.

Cotton is a cellulose which is a polysaccharide.

## Functioning of carbohydrates :

- 1- It provides energy to the body.
- 2- It plays role in the working and functioning of many organs.
- 3- It is the major component of Kreb's cycle and glycolysis.
- 4- It provides strength to the muscles and nervous system.
- 5- Cotton a carbohydrate used in textile.