

(2019)

Q.1.

DIFFERENTIATE BETWEENRENEWABLE ENERGY① Definition:

Resources/ Energy that is naturally replenished on a human timescale and can be used again and again.

② examples:

solar power, hydropower, wind energy, biomass, biofuel and thermal energy.

③ Nature:

can be used again and again.

④ Carbon Emission:

Has low carbon emission so it is

NON-RENEWABLE ENERGY① Definition:

Resources/ Energy that will eventually run out and cannot be produced on a timescale ~~comparable~~ comparable to human consumption.

② examples:

oil, gas, coal, diesel and nuclear power

③ Nature:

can be used only for a fixed amount of time.

④ Carbon emission:

Has high carbon emission so it is not

environment friendly

⑤ Installation Cost:

It is low as it is readily available

⑥ Maintenance Cost:

It is high.

⑦ Area Required:

Large area is required to set up power plant.

⑧ Use in Pakistan:

currently, use is less. However, steps are being taken to increase use in the light of climate crisis.

environment friendly

⑤ Installation Cost:

It is high.

⑥ Maintenance Cost:

It is low.

⑦ Area Required:

Small area is sufficient for installation of power plant.

⑧ Use in Pakistan:

currently, more dependant on non-renewable resources, primarily on coal.

(2018)

Q. Define biofuel. How is it helpful to promote clean energy?

Q.

→ DEFINITION OF BIOFUEL

Biofuel can be defined as:

• Fuels that are produced directly or indirectly from organic materials known as biomass, including plant and animal waste.

Bioenergy is the energy that is derived from biofuels and represents approximately 10% of the world demand.

→ Types:

Biofuels can be broadly classified as follows:

Classification

primary biofuels

- include fuel wood, wood chips and pellets and unprocessed organic material

secondary biofuels

- produced by processing of biomass resulting in alcohol and biodiesel.

→ PROMOTION OF CLEAN ENERGY:

In order to understand how biofuels promote clean energy it is important to know how they are produced. The three types of biofuels - bioethanol, biodiesel and biogas - are produced by natural and organic waste.

Biomass Feedstock:

The biofuels are generated by biomass feedstock from agricultural, animal and urban waste products.

These include:

- (1) Grains and starch crops
- (2) Agricultural residues
- (3) Animal by products
- (4) Plant waste
- (5) Forestry materials
- (6) Energy crops
- (7) Urban and suburban wastes

All of these materials are either renewable energy sources and represent the excess waste products and byproducts.

• Advantages:

(1) Renewable Energy Sources:

The crops ^{+waste} are the basis of the generation of biofuels. These sources are renewable in nature which means they will not run out of and can be used over and over again. Nowadays, most of the fuel used is by the combustion of non-renewable resources that are rapidly diminishing in nature. Therefore, the biofuels can be used for a long time.

(2) Reduce Green House Gases:

It promotes clean energy as it releases reduced amount of greenhouse gases. As the resources are renewable, they are environment friendly and result in reduced carbon footprint in nature.

(3) Utilization of waste products:

As it utilizes waste products of plants and animals, it in turn helps to reduce pollution in the environment and gives a proper channel for utilization of waste products.

(2018) Q. What is Acid Rain? Describe its causes and how it can be prevented.

Q.

ACID RAIN

→ DEFINITION:

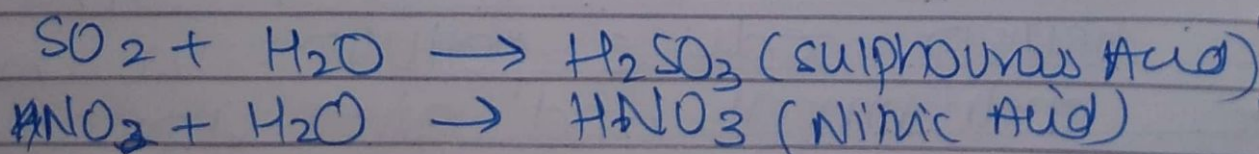
Acid rain is a broad term and can be defined as

• a mixture of dry and wet depositions that contains higher than normal concentration of sulphuric and nitric acid.

The sulphur oxide and NO_2 in air tend to react with atmospheric water to form acidic substance.

• FORMATION:

The gases in the air undergo a chemical reaction that results in the formation of acid. These reactions are:



CLASSIFICATION:

WET DEPOSITION

If acid or chemicals are blown in an area where the atmosphere is wet and it precipitates in the form of rain, snow, fog or mist.

DRY DEPOSITION

If acid or chemicals are blown in areas where the weather is dry then it becomes incorporated in dust or smoke.

→ CAUSES:

(1) Increased used of fossil fuels:

The use of fossil fuels in various sectors is still prevalent despite several warnings and alternatives. The burning of fossil fuels, especially **coal**, that result in the release of sulphur in the atmosphere. It contributes to increase concentration of sulphur leading to acid rain.

(2) GHGs:

The green house gases tend to be trapped in the atmosphere for a long period of time. They get

incorporated in rainwater and are deposited. On the other hand, they can also present in the atmosphere as **smog**.

(3) Increased use of automobiles:

Increased urbanization has led to increased use of automobiles.

This results in increased emission of harmful gases due to combustion of fuel.

(4) Industrialization:

Increased industrialization has had detrimental effects on the atmosphere. Sometimes, untreated smoke is released into the atmosphere that results in dry and wet deposition of acids.

(5) Chemical Manufacturing:

Use of chemicals and their manufacture results in release of toxic chemicals into the air and water sources.

(6) Forest Fires and Domestic Fires:

The increased forest fires due to global warming play a significant role in causing acid rain. The fire smoke due to combustion release gases such as SO_2 into the atmosphere that contribute towards Acid Rain.

→ PREVENTION:

There are several steps that can be taken in order to prevent acid rain.

(1) Reducing SO_2 and NO_2 emissions:

This can be done by controlling the release of these gases by power plants, factories and motor vehicles.

(2) Conservation of Energy:

Appliances that save energy contribute by emitting less toxic substances in the atmosphere.

(3) Cleaner-burning Fuels:

Fuels, such as low sulphur containing coals and biofuels should be used in

order to decrease the carbon print in the atmosphere.

(4) Use of Renewable Energy Resources:

A shift should be made from non-renewable to renewable energy resources as they are more environment friendly.

(5) Use of scrubbers:

Devices such as scrubbers should be used in the chimneys so that no untreated smoke is sent out in the atmosphere.

(6) Catalytic converters:

Catalytic converters should be used in cars to reduce NO_x emissions into the atmosphere.

Q. Difference between Rotation and Revolution of earth.

ROTATION OF EARTH

① Movement:

Rotation of earth is the movement of earth on its axis.

② Duration:

Rotation by earth is completed in one day.

③ Direction:

Earth rotates from west to east.

④ Results:

Rotation of earth around its axis results in the formation of day and night.

⑤ Speed:

The speed at equator is almost 1000 mph.

REVOLUTION OF EARTH

① Movement:

Revolution of earth refers to movement of earth around the sun.

② Duration:

Revolution by earth is completed in one year.

③ Direction:

Earth revolves around the sun counterclockwise.

④ Results:

Revolution of earth around the sun is responsible for change in seasons.

⑤ Speed:

The speed is approximately 66,000 mph.

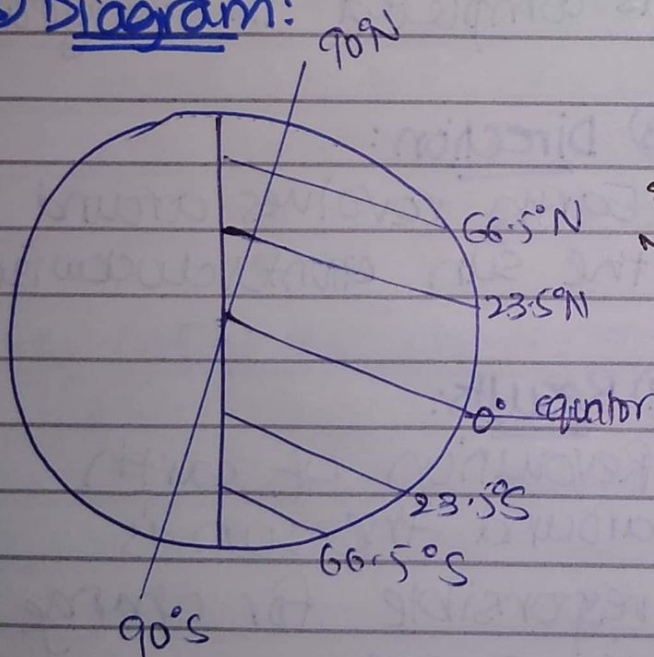
⑥ causes:

Rotation is the cause of tides, currents and winds.

⑦ Function:

It causes a bulge at the equator of earth.

⑧ Diagram:



⑥ causes:

Revolution causes equinox and solstices.

⑦ Function:

It balances centrifugal and centripetal forces

⑧ Diagram:

