

2. Sustainability & Renewable Resources

Types of Natural Resource

- 1] Forest natural Resource
- 2] Coal Resource
- 3] Mineral Resource
- 4] Energy Resource.

1] Forest natural Resource

Almost large area covered by forest on the earth.

That is $\frac{1}{2} \%$

- Depletion of Forest Resource

① For the construction of buildings also development of industries.

② use for agriculture

- impact on daily life

③ It's affect on raising the temperature increase green house gases

④ Decrease the Bio diversity.

⑤ Environmental pollution

⑥ affect on human life

- Control

1] United State and world bank arrange the program that is Redd. [Reducing Emission From deforestation for Forest degradation]

2] Encourage to people for Reforestation

3] water Resource

2] water Resource

71% of area covered by water.
In plants and animals 60 - 65% cover water in their body

Depletion :

① The waste water of industries it is pollute surface water of ground and also pollute ground water.

② The despoition of garbage are added in River, Ponds, and lakes, sea, ocean, and pollute the water.

③ Changing the environment it is also responsible for pollute the water.

Impact :

- ① agriculture productivity loss
- ② Disturbing work of industries
- ③ Decrease the under ground water

Control

- ① The arranging program like Save water
Sufficient use of water in daily routine
- ② Rain water harvesting for using long time
gardening and cleaning purpose.

3) Mineral Resource

minerals are obtain from mines

Depletion :

- ① Construction of building works.
- ② overuse of fossile fuel, petrol, coal, diesel

impact

- ① affect on Marine life It causes air pollution.
- ② land slide accident in that area.

(ii)

Control

- (i) Use Synthetic materials for construction of building work.
- (ii) Reduce the use of Fossil Fuels
- (iii) []

4) Energy Resource

Renewable Energy

- (i) Wind energy
- (ii) Solar energy
- (iii) Hydro electrical energy
- (iv) Biomass Energy

Non-Renewable Energy

- (i) Coal
- (ii) petrol
- (iii) Diesel (Fossil Fuel)

Depletion

- 1] Overuse of Non-Renewable energy
- 2] Insufficient use in industries

Impact

- (i) Shortage supply of energy & increase the cost
- (ii) Disturbing industries work

Control

Conserving electrical Resources

- ① Reduce the use of Non-Renewable energy
- ② public transportation

Q. MCQ's

1) How many types of Natural Resources

1] 1 2] 4 3] 8 4] 3

2) ____ % of area covered by water.

1] 70 2] 71 3] 72 4] 73

3) ____ % of water is present into plants & animals.

1] 60 - 65% 2] 80% 3] 90% 4] 75%

4) What is full form of Redd:

- a) Reducing emission from deforestation or degradation
- b) Recovering emission from deforestation or degradation
- c) Restoring emission from deforestation or degradation
- d) None

5) Wind, Solar, Biomass, Hydroelectric energy is which type of energy?

a) Renewable b) Non-Renewable c) Both a & b d) None

IKS - Concept of Panchmahabhuta

Prithvi (Earth)

Jal (Water)

Agni (Fire)

Vayu (Air)

Akasha (Space)

① Prithvi (Earth)

- It is solid element of matter
- The quality includes are heaviness, toughness, stability strength

Role of Universe

It is the formation of plants animals and humans.

Role on human body

It is support our body parts that is bones muscles and tissue.

② Jal (Water)

- It is the liquid element of the earth
- The quality includes are coolness, softness, and movement.

Role of Universe

It is maintain the growth of all living organism

Role on humanbody
It is helps to for digestive System that
is hydration.

③ Agni (Fire)

It is the transformation of heat and
energy

Qualities are brightness, sharpness, and
activeness.

Role of Universe.

Transformation of energy from one form
to another form.

Role of humanbody.

Helps to digestive System.

∴ The food is converted into energy
and energy is converted into thought
and action.

④ Vayu (air)

All the particles are in motion

Qualities are Warmness, movement etc.

Role of universe.

All the elements exist it is the circulation
of all gases that is O_2 , CO_2 , CH_4 , etc.

Role of humanbody

It helps for nervous system and blood circulation

⑤ Akasha (space)

All the elements exist and interact with each other.

Qualities are expansive, firmness, stability

Role of universe.

All the elements exist and communicate with infinity.

Role of humanbody

It helps to human body that is mental health & spiritual health.

MCQ.

① What is full form of IKS

a) Indian Knowledge System

b) International Knowledge System

c) Indian known System

d) None

② How many concept of panchmahabhuta.

a) 5

b) 4

c) 3

d) 2

③ the quality include heaviness, Roughness and strength in —
a] Jal b] Vayu c] Prithvi d] Agni

④ the transformation of heat into energy called —
a] Jal b] Agni c] Vayu d] Prithvi

⑤ All particles are in motion called —
a] Vayu b] Agni c] Jal d] Prithvi

Classification of Energies

1] Nuclear Energy

- Nuclear Fission

- Nuclear Fusion

eg isotope of U-235 - produce electricity
- release 1 kg NE
- 3000 tons burning of coal

- It is the non-Renewable energy

- It is defined as the formation of Nuclear Fission and Nuclear Fusion in which release of energy that is known as Nuclear energy

- It is also release Nucleus of the atom

Types of Nuclear energy

There are two types

1] Nuclear Fission

2] Nuclear Fusion

1] Nuclear Fission.

The breaking of heavy Nucleus into two or three small lighter Nuclei called Nuclear Fission.

2] Nuclear Fusion

The formation of two or three lighter Nuclei into heavy nucleus.

Ex:

isotope of U - 235

Applications of Nuclear energy.

1] It is used in Nuclear technologies :-

That is Nuclear Energy generator.

2] Nuclear medicine :-

That is used in cancer treatment. like Radiation therapy.

3] Agriculture use.

That is Enhanced the crop yield and soil fertility.

4] It is used in Engineering project.

- 5) Space mission.
- 6) used in scientific Research.

2) Thermal Energy

- It is the Renewable energy

- It is defined as this is the type of internal energy in which particles are in motion or heat energy.

- Increase the movement of particles increase the thermal energy.

Types of thermal Energy

- ① Chemical energy
- ② Internal energy
- ③ Sensible heat
- ④ Latent heat

1) Chemical energy

- The formation of chemical reaction in which release of energy known as chemical energy.

- This energy produce heat & electricity.

2) Internal energy

- It is the sum of kinetic energy and potential energy.

3] Sensible heat

The energy in which it is detected by thermometer

- It causes change in temperature without changing phase

Ex: boiling of water.

4] Latent heat

In which the phase of the substance is changes without changing temperature.

Ex: Ice converted into water.

Application

- It is used in power generation that is thermal power plant
- Used in industries: that is manufacturing product.
- used in transportation that is vehical of the engine.

3] Biomass energy

The Combustion of wood crop Agriculture residue and animal waste to produce Biomass energy

- This is the renewable energy

In which release of gas is Methane (CH_4)

Applications

- used in cooking purpose
- generation of electricity
- agriculture use.

4] Solar energy

This is the Renewable energy

- It is generated by Sun radiation that is Electromagnetic radiations
- It is absorb earth surface that is 45% radiation.
- And required Wavelength is 400nm to 700nm

Application:

- used in Solar cooker
- used in Solar water heater
- agriculture use
- used in photovoltaic cell.

5] Wind energy

This is generated by air that is high speed of motion.

ex:

Turbine machine, wind mill machine
The rotation of this turbine machine in high speed to produce wind energy.

Uses

- It is the Renewable energy.
- It is maintain the temperature of the Environment.
- It is produce heat & electricity.
- used in spots that is wind surfing.

5] Hydro - electric energy

Hydro - electrical energy It is generated by water.

The construction of dam outside the river and this store water by using turbine machine to produce Hydro - electrical energy.

Uses.

Agriculture, Industries, In Homes for daily uses, produce heat & electricity.

It is Renewable energy.

Biofuels

The Hydrocarbons which is produce organic material in short period of time

Ex: Solid : coal, charcoal, & solid waste material

Liquid : petrol, diesel, kerosin, oil.

Gas : Biogas, Natural gas

Types of Biofuels

① Bio ethanol

② Biodiesel

③ Biogas

④ Biobutanol

⑤ Biohydrogen

1 Bioethanol

It is made up of corn and sugarcane
By using fermentation process

Ex:

2) Biodiesel

It is made up of vegetable oil
Soybean oil & palm oil by using
transesterification process / transesterification

Vegetable oil + Alcohol $\xrightarrow[\text{heat}]{\text{Catalyst}}$ Biodiesel

3) Biogas

It is made up of solid organic waste material By using gasification process.

4) Biobutanol

It is same like as Bio ethanol and made up off ABE fermentation that is Acetone Butanol Ethenol

5) BioHydrogen

It is same like as biogas and produce pyrolysis process

Uses

It is Reduced the emission of green house gases

It is produce heat and electricity

It is Reduce organic solid material and converted into Biofuels.

• Green Solutions : New energy Sources

- 1) Hydrogen energy
- 2) ocean energy
- 3) Tidal energy

1) Hydrogen energy

Hydrogen energy it is generated by renewable energy sources that is wind energy, solar energy, and Hydro-electrical energy.

It is also called as green hydrogen and H_2 energy.

Production of H_2 energy

1) Thermal process

By using fossil fuels that is the burning of coal to produce H_2 energy.

In Biomass By using gasification process of the waste organic solid material to produce H_2 energy.

2) Biological and thermochemical process

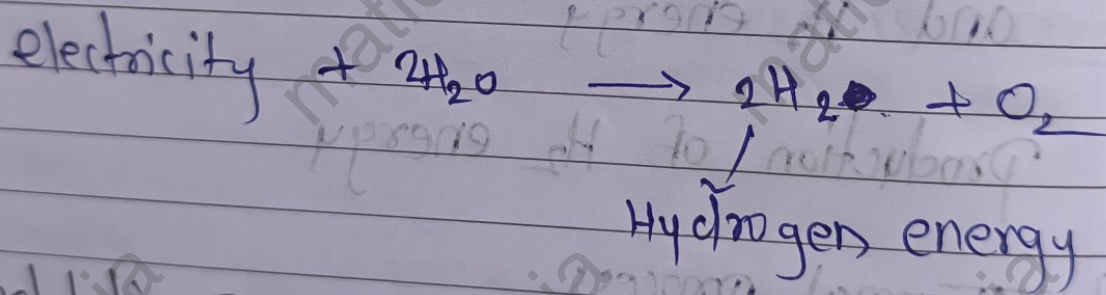
In Biological using fermentative reactions of the microorganism to release of

Heat it is H_2 energy

In thermochemical the formation of chemical reaction using heating condition the release of Heat that is H_2 energy

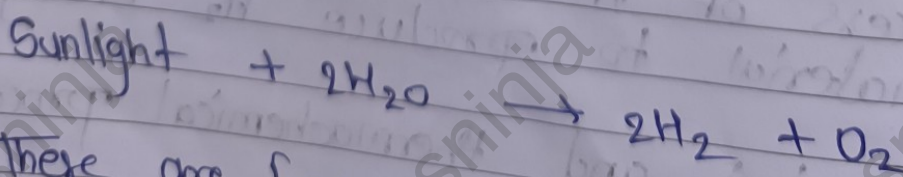
3) Electrolytic process

By using electricity the water molecule split into to separate component that is H_2 & O_2 and produce H_2 energy



4) Photolytic process

By using sunlight the water molecule split into the separate component that is H_2 & O_2 and produce H_2 energy



These are four process of Hydrogen energy

2] Ocean energy

It is the natural movement of water, tides in which to generate kinetic energy to produce ocean energy.

production of ocean energy

1] Wave energy

2] Marine Current energy

3] Ocean thermal energy

1] Wave energy

It is generated by wind speed, duration of wind and temperature difference warm water of the surface and deep cold water to generate kinetic energy & this is transferred into water to produce ocean energy.

2] Marine Current energy

By using turbine machine to produce ocean energy that is the formation of waves to movement of turbine blades in high speed of the surface water to generate kinetic energy.

3] Ocean thermal energy

It is based on the temperature difference between warm water of the surface and cold deep water of the ocean to produce ocean energy.

3] Tidal energy

It is the gravitational interaction between Sun, moon and earth and causes tides to produce tidal energy.

By using turbine machine to produce tides that is rise and fall of water layer of the ocean.

Uses

- 1] To produce heat & electricity
- 2] To reduce the emission of greenhouse gases
- 3] To stop climate change
- 4] To store or using for in future