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Subject: - PHYSICS, CLASS - IX

Chapter: - 6 (HEAT and Energy)

6(c) Energy sources

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Q1: → What are the characteristics of a. Energy source?

Ans

- (1) It can provide an adequate amount of ^{useful} energy over a long period of time.
- (2) It must be safe and Convenient to use.
- (3) It must be economical and easy to store and transport.

Q2: → Name the two groups in which various sources of energy are classified. State on what basis are they classified.

Ans 2: → On the basis of availability; Energy sources are classified into two groups.

- (a) Renewable or non-conventional sources of Energy
- (b) Non-renewable or conventional sources of Energy.

Q3: → Differentiate between Renewable and Non-renewable energy sources with examples.

Ans:-

<u>Renewable sources</u>	<u>Non-Renewable Sources</u>
① These are the sources from which energy can be obtained continuously over a long period of time.	① These are the sources from which energy cannot be obtained continuously over a long period of time.
② These sources can be regenerated.	② These sources cannot be regenerated.
③ They are non-conventional sources of Energy.	③ They are conventional sources of energy.
④ These are natural sources which will not get exhausted.	④ These are the natural sources which will get exhausted with time.
⑤ <u>Examples</u>: - Sun, flowing water, wind, tides, Biomass	⑤ Coal, Petroleum & natural gas are the examples of these sources.

Q4 → What is (a) Solar energy (b) Wind energy (c) Tidal energy explain in brief.

Ans 1 → (a) Solar Energy → The energy obtained from the sun is called Solar Energy. Nuclear fusion reactions that are occurring in the interior of the sun generate huge amount of energy. The solar energy reaching the earth's surface is absorbed by lands, plants and water bodies like rivers, ocean and lakes.

(b) Wind Energy → The kinetic energy of the wind is called wind energy. The large mass of moving air is known as wind. Due to motion, it has kinetic energy.

(c) Tidal Energy → The energy possessed by rising and falling water in tides is known as tidal energy. The rise of ocean water near the coast is called high tide and fall of ocean water is called low tide.

Q5 → What is a solar cell? State two uses of solar cells. State whether a solar cell produces A.C (alternating current) or D.C (direct current). Give one disadvantage of using a solar cell.

Ans → The device which converts solar energy into electrical energy is called solar cell.

Uses of solar cells 1 → (a) Small solar cells are used in watches and calculators.

→ Solar cell produces direct current.

disadvantage of solar cell 1 → It cannot be used in absence of light from any source.

Q6: → State two advantages and disadvantages of producing hydroelectricity.

Ans: →

Advantages: → (a) It does not produce any environmental pollution.

(b) It is a renewable source of energy.

(c) The dams constructed over the rivers help us in irrigation and control of floods in rivers.

Disadvantages: → (a) The flowing water is not available everywhere.

(b) Due to construction of dams over the rivers, plants and animals of that place get killed or destroyed.

Q7: → What is a Nuclear Power plant?

Ans: → It is the set up which is used for the production of electricity from nuclear energy by the controlled chain reaction of nuclear fission of a radioactive substance like Uranium-235.

Q8: → State two advantages and disadvantages of using nuclear energy for producing electricity.

Ans: → Advantages: → (a) A very small amount of nuclear fuel (U-235) can produce a tremendous amount of energy.

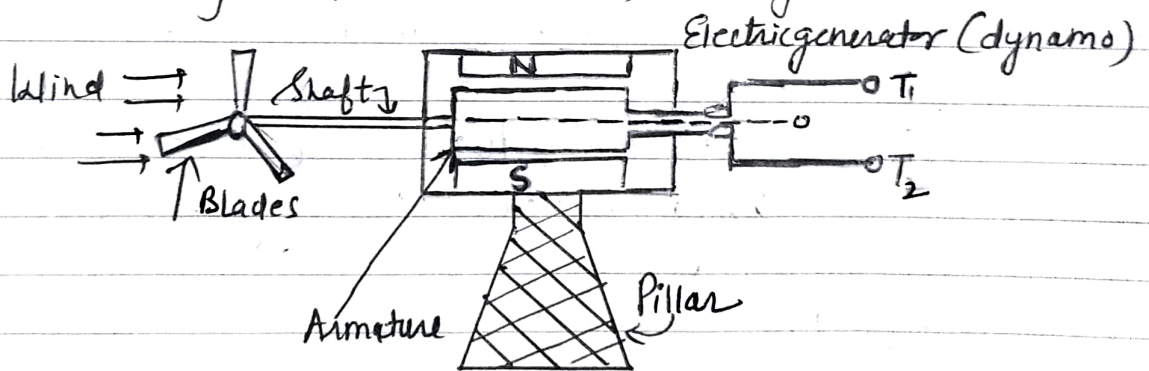
(b) Once the nuclear fuel is loaded into a nuclear power plant, it continues to release energy over a long period of time.

Disadvantages :→ (a) Very harmful nuclear radiations are produced during the process. (Page 4)
 (b) The waste obtained from the nuclear power plants causes a high degree of environmental pollution.

Qus 9 :→ How is wind energy used to produce electricity?
 How much electric power is generated in India using Wind Energy?

Ans Wind Energy is used in a wind generator to produce electricity by making use of a wind mill (or wind turbine) to drive a wind generator.

When the blowing wind strikes the blades of the wind mill (or wind turbine), the kinetic energy of wind changes into rotational K.E of the blades. Rotation of blades rotates the armature of the generator in the magnetic field between pole pieces (N) North and south (S) of a strong magnet. Thus alternating current (a.c) is generated.



(Wind Generator)

Q10 :→ What is nuclear energy? Name the process used for producing electricity using the nuclear energy?

Ans :→ Nuclear energy is the energy released in nuclear fission nuclear fusion reactions. In both processes, origin of energy is loss in mass. According to Einstein's mass-energy equivalence relation $E=mc^2$, loss of mass is converted into energy.

Where $\text{loss in mass} = \text{Sum of masses of Reactants} - \text{Sum of masses of Products}$
 during a Nuclear reaction

→ Nuclear fission with controlled chain reaction in a nuclear reactor is used for producing electricity from nuclear energy.

Q11:- Name five renewable and three non-renewable energy sources?

Ans Renewable sources :-
 (a) Sun (b) Wind (c) Flowing water (d) Biomass
 (e) Tides
Non Renewable sources :- (a) Coal (b) Petroleum
 (c) Natural Gas.

Q12:- State energy transformation in the following?

⇒ (a) Electricity is obtained from Solar energy
Ans Light energy to electrical energy

⇒ (b) Electricity is obtained from wind energy.
Ans Mechanical Energy to Electrical Energy.

⇒ (c) Electricity is obtained from Hydro Energy.
Ans Mechanical energy to electrical energy.

⇒ (d) Electricity is obtained from Nuclear Energy.
Ans Nuclear energy is converted into Electrical Energy.

Q13:- What is a solar power plant?

Ans:- It is a device in which heat energy of the sun is used to generate electricity.

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