SHIKSHA CLASSES

Subject : Science -II **Answer Paper** **Total Marks : 20**
Class : X **5. Towards green Energy**

Q.1: A) Choose the correct alternative : 2

1) Thermal energy is used to generate ------ energy.

Ans. : a) Electrical

2) ------ energy of water in dams is used for generation of electricity.

Ans. : b) Potential

B) Solve the following questions. (Any One) 1

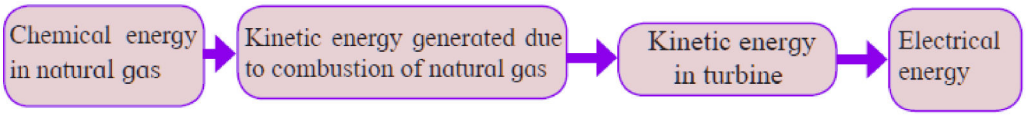
1) Find the coretation

Biofuels : Nonconventional energy source : : coal : _____

Ans. : Biofuels : Nonconventional energy source : : coal : **Conventional energy source.**

2) Diagrammatically show energy transformation in thermal power plant.

Ans. :



Energy transformation in thermal power plant

3) Name the principle on which most of the electric power plants are based.

Ans. : Most of electric power plants are based on the principle of electromagnetic induction.

Q.2: A) Give scientific reason. (Any One) 2

1) Steam is used to rotate the turbine.

Ans. : i) The steam turbine is a device that extracts thermal energy from pressurized steam and used it to do mechanical work on a rotating turbines.

ii) All the heat and kinetic energy lost by the steam would be gained by the turbine and converted into useful K.E.

2) The energy in the coal is called as chemical energy.

Ans. : Chemical energy is energy stored in the bonds of chemical compounds. It is released in a chemical reaction often producing heat as a byproduct when bonds between atoms are broken or formed called a chemical reaction.

When the coal is heated between atoms are broken is produced due to the chemical reaction therefore the energy in the coal is called as chemical energy.

B) Solve the following question. (Any Two) 4

1) Write the advntages of nuclear power plant.

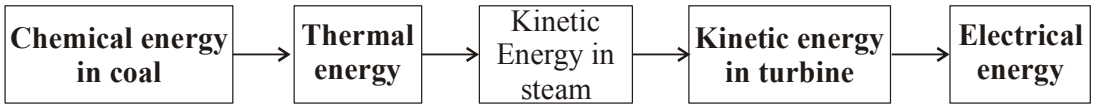
Ans. : Advantages of nuclear power plant :

i) A nuclear power plant does not use fossil fuel like coal therefore problems like air pollution does not arise.

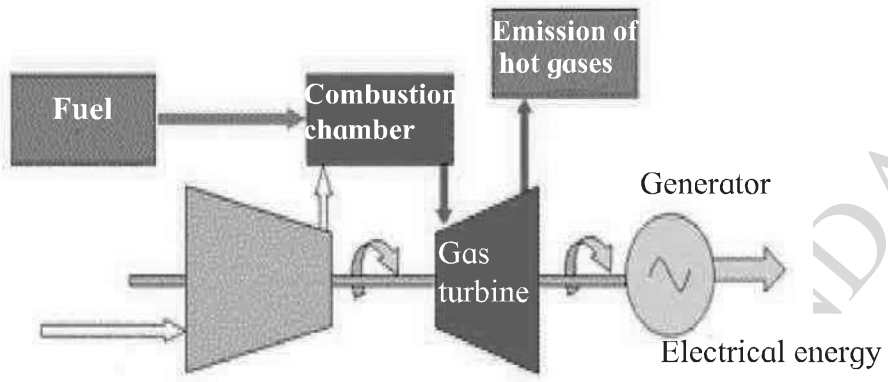
ii) If sufficient nuclear fuel is available this can be a good source of electrical energy.

2) Complete the flow chart of step by step transformation of energy in thermal power plant.

Ans. :



3) Observe the given diagram and answer the following question.



i) Which fuel is used for this power plants?

ii) Is this power plant is environment friendly? Why?

Ans. : i) Combustion of natural gas is used as a fuel for this power plant.

ii) Yes, this power plant is environment friendly because the natural gas does not contain sulphur so burining of natural gas results in less pollution.

4) What are the limitation of solar energy?

Ans. : i) Solar energy storage is expensive.

ii) Sun do not shine 24 hr of day. When sun is not shining there is no generation of energy.

iii) Solar panel required large space.

iv) Material used to make solar panel can cause pollution.

v) Complication in moving the solar panal.

Q.3: Solve the following questions. (Any Two) 6

1) What are the problems related to thermal power generation?

Ans. : The problems related to thermal power generation are.

1) Air pollution due to burning of coal. Burning of coal results in emission of gases like carbon dioxide, sulphur oxide and nitrogen oxide which are harmful to the health.

2) Along with the emission of gases due to burning of coal, soot particles are also released into the environment. This may cause serious health problems related to the respiratory system.

3) The reserves of fuel used in this method i.e. coal are limited. Therefore in future, there will be limitations on the availability of the coal.

2) How does nuclear fission take place?

Ans. : 1) When neutron is bombarded on atom of uranium – 235, it absorbs the neutron and converts into its isotopes uranium – 236.

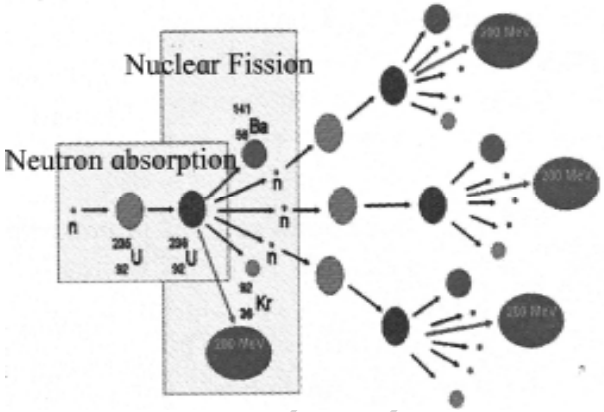
2) Uranium – 236 being extremely unstable converts into atoms of Barium and Krypton through a process of fission releasing three neutrons and 200 mev energy.

3) The three neutrons generated in this process causes fission of three other uranium – 235 atoms releasing more energy.

4) The neutrons released in this reaction release more energy through fission of more uranium nuclei.

5) This process of uranium – 235 atoms continues and is called the chain reaction.

6) In nuclear power plants, a controlled chain reaction results in release of thermal energy, which is used for electric energy generation.



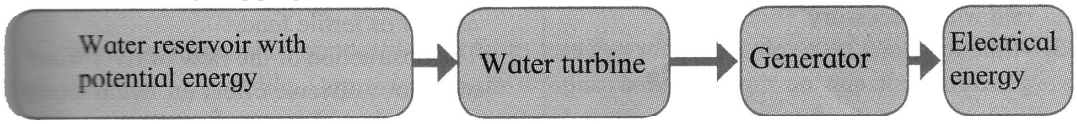
Nuclear fission (Chain reaction)

3) Explain the advantages of hydroelectric power plant using a block diagram.

Ans. : 1) Since no fuel is burnt in hydroelectric power generation, there is no pollution resulting from combustion of fuels.

2) If there is sufficient water storage in the dam, it is possible to generate electricity as and when necessary.

3) Although water reservoir is used for power generation, it can be replenished during rainy season leading to uninterrupted power generation.



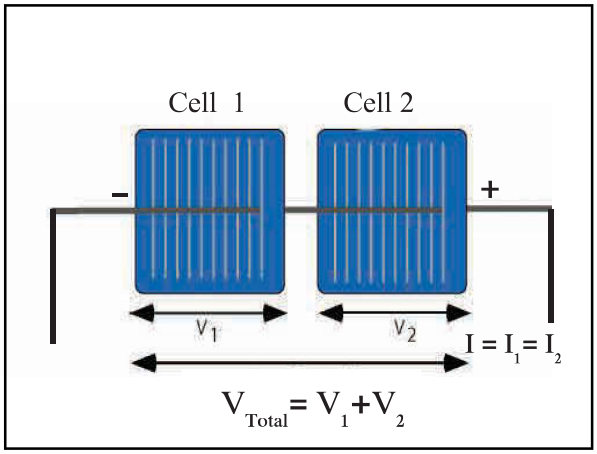
Different Stages in hydroelectric power plant

4) How can we get the required amount of energy by connecting solar panels?

Ans. : a) 1) If two solar cells are connected in series, the potential difference obtained from the combination is addition of the potential differences of individual solar cells.

2) However, the current generated from this combination, is equal to the current from an individual cell.

3) It means that when solar cells are connected in series, currents from the individual cells are not added

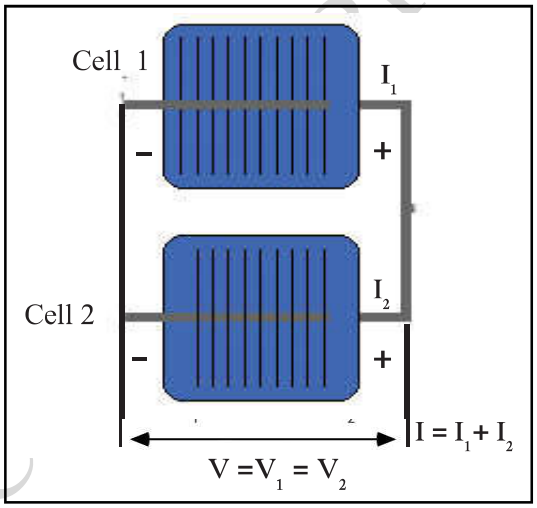


Solar cells in series

b) 1) Similarly if two solar cells are connected in parallel, the current generated from this combination is the summation of the currents from an individual solar cells.

2) However, the potential difference, obtained from this combination is the same as the potential difference obtained from individual cells.

3) Thus, if two solar cells are connected in parallel, the potential differences from the Two cells are not added.



Solar cells in parallel

In this way, by connecting many solar cells in series and in parallel solar panels generating required current and potential differences are made.

Q. 4: Solve the following question. (Any One) 5

1) Explain energy obtained from fossil fuels is not green energy.

Ans. : i) The energy produced from renewable energy sources which are never ending is called green energy.

ii) Fossil fuels is non renewable energy source for e.g. coal, petroleum, diesel.

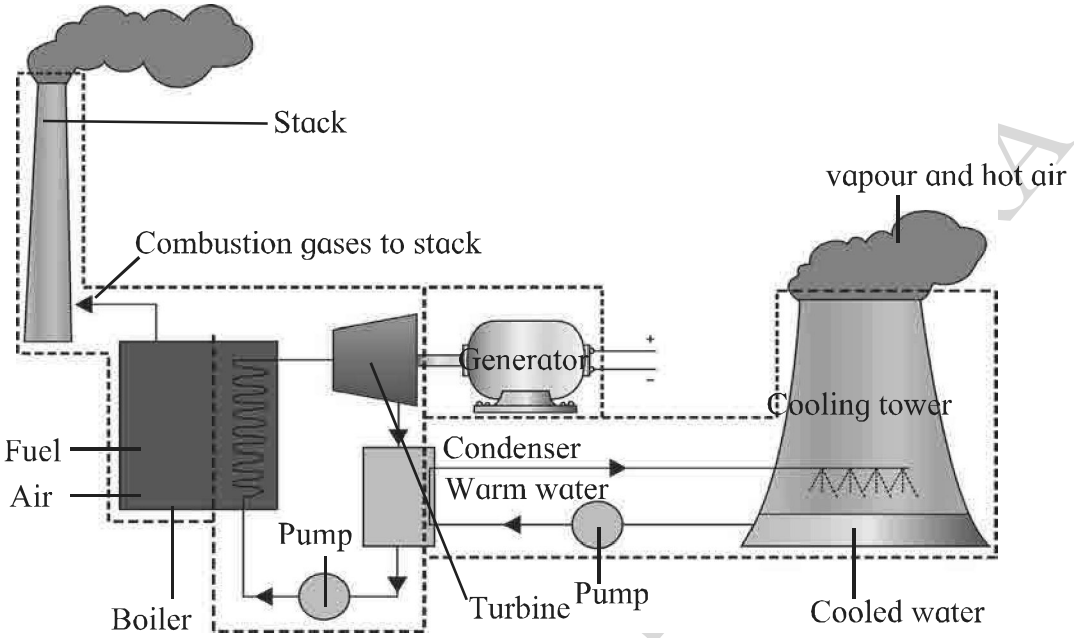
iii) Deposits of fossil fuels are limited and they obtained from mines.

iv) Lakh's of years ago remnants of plants and animal got buried into the earth. They were converted into fossil fuels due to the tremendous pressure of the earth's layers above them

and the heat inside this process does not take place in a short time but it requires lakh's of years.

v) As a result formation of fossil fuels required lakh's of years. So once fossil fuel deposits are finished we have to wait for lakhs of year. It is not easily available so fossil fuels is not green energy as the deposit are limited.

2) Observe the given diagram and answer the following questions.



i) Name the power plant shown in the figure.

ii) How turbine is rotated in this plant?

iii) Name the two towers seen in given diagrams.

iv) What is the function of condenser?

v) Name the fuel used in this plant.

Ans. : i) It is thernal power plant.

ii) Turbine is rotated by using steam.

iii) There are two towers in this plant

i) Stalk - Tower no - 1

ii) Cooling Tower

iv) The steam is condense back to water by releasing heat in water.

v) In this plant coal fossil fuel is used.

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