PHYSICS

BOOKS - CHETAN PHYSICS (TAMIL ENGLISH)

TOWARDS GREEN ENERGY

Fill In The Blanks And Rewrite The Statement

1. The principle of ..... was invented by Michael Faraday.

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2. If a coil made of conducting wires is rotated between poles pieces of the permanent magnet. The motion will generated a current and this device is called

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3. The water in a cooling tower in thermal power plant is circulated through the .....

.

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4. In thermal power plants, the ..... energy in the coal is converted into electrical energy through several steps.

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5. In nuclear fission, the energy released by fission of nuclei of atoms like ..... and

..... is used.

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6. Natural gas does not contain element ..... , so burning of natural gas results in less pollution.

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7. In Hydroelectric plants, the..... energy of the flowing water drives the turbine

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8. ..... is a factor necessary for wind - energy generation, but is not available everywhere.

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9. A silicon solar cell of dimension 1 cm^2 generates current of about ..... mA.

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10. Solar cells are made of a special type of material called ..... such as silicon

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11. Many solar panels connected in series form a solar strings and many solar strings connected in parallel form a solar ..... .

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12. A transformer transforms the ..... and current levels of the generated power.

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13. Incomplete combustion of fossil fuels leads to formation of ..... gas which adversely affects our health.

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14. An electronic device that convents D.C. Solar power into AC power is called ..... .

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15. ..... and ..... fuels are obtained from Natural gas.

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Find The Odd One Out

1. Boiler, turbine, generator, solar cell.

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2. Thermal energy, atomic energy, wind energy, natural gas power.

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3. Uranium, plutonium, coal, thorium.

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4. Flowing water, water stored in dam, moving fan, running train.

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5. LPG, CNG, coal, methane.

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6. Edible oil, LPG, CNG, crude oil.

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7. Solar energy, nuclear energy, tidal energy, wind energy.

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8. Carbon dioxide, oxygen, sulpur dioxide, nitrogen dioxide.

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Find Out The Correlation

1. Thermal power plant : Coal : : Nuclear power plant : ..... .

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2. Series arrangement of modules : Strings : : parallel arrangement of string : ..... .

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3. Coal consumption of world : 41 % : : coal consumption in India : .....

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4. Natural gas: CNG and LPG : : Nuclear power: .....

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5. Silicon solar cell of 1 cm^2 : 30 mA : : 100 cm^2 : .....

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6. Water stored in dam : Potential energy : : Flowing water : .....

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7. Atomic power plant : Stearn turbine : : Natural power plant : .....

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8. Inverter: DC to AC:: Photovoltaic cell: .....

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Match The Columns And Complete The Table

1. Match the following

Column A	Column B
(1) Mass	(a) m/s
(2) Weight	(b) m/s^2
(3) Acceleration	(c) kg
(4) Velocity	(d) N

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2. Match the following

Column A	Column B
(1) Mass	(a) m/s
(2) Weight	(b) m/s^2
(3) Acceleration	(c) kg
(4) Velocity	(d) N

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3. Match the following

Column A	Column B
(1) Mass	(a) m/s
(2) Weight	(b) m/s^2
(3) Acceleration	(c) kg
(4) Velocity	(d) N

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State Whether The Following Statements Are True Or False And Correct The False Statement

1. There is heat energy stored in coal.

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2. In thermal power plant water is boiled using cooling tower.

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3. In thermal power plant, turbine rotates because of steam.

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4. In the nuclear reactor, aluminium is used as a fuel.

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5. The reaction in the atomic reactor is a type of uncontrolled chain reaction.

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6. If U-235 is bombarded with a neutron, it gets converted into U-237.

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7. Atomic energy is a very good energy source.

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8. The efficiency of natural gas plant is less than that of thermal power station working on coal.

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9. Energy released during fission is measured in joules.

10. The product after fission of nuclear fuels are harmless.

11. Carbon dioxide generated due to buring of fuels like coal, diesel leads to problems like acid rain.

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12. In wind turbine the function of the gearbox is to increase rotations per unit time

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13. Wind turbine of specific capacity is selected depending on altitude.

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14. In Nuclear fission, Uranium 236 releases two neutrons and converts into Barium and krypton.

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15. Solar cells are made up of Silicon.

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Answer The Following In One Sentence

1. What is Energy?

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2. Write the types of mechanical energy?

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3. Where can we install wind turbines?

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4. Can electrical energy be generated without using the principle of electromagnetic induction?

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5. What is meant by Green energy? Give examples of green energy?

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6. Which electricity generation process is eco-friendly and which is not?

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Choose And Write The Correct Option

1. Electromagnetic induction was discovered by ..... .

A. Edison

B. Newton

C. Michael Faraday

D. Archimedes

Answer: C

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2. In combustion of coal ..... gas is not released.

A. SO_2

B. NO_2

C. NH_3

D. CO_2

Answer: B

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3. Each nuclear fission of uranium nucleus releases ..... neutrons.

A. one

B. two

C. three

D. four

Answer: C

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4. Water stored in a dam possesses

A. chemical

B. potential

C. kinetic

D. electric

Answer: B

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5. The electric energy obtained from solar photovoltaic cell is of ..... type.

A. DC

B. AC

C. static

D. magnetic

Answer: A

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6. Solar cell can work during ..... only.

A. night

B. morning

C. day time

D. evening

Answer: C

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7. Each nuclear fission of uranium nucleus release ..... energy.

A. 20 MeV

B. 236 MeV

C. 237MeV

D. 200 MeV

Answer: D

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8. Wind turbines with capacity right from' less than ..... to about ..... are commercially available.

A. 1 kW, 7000 kW

B. 10 kW, 700 kW

C. 1 MW, 700MW

D. 1 kW, lOkW

Answer: A

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9. A good solar cell can have an efficiency of around .....%

A. 5

B. 1

C. 15

D. 51

Answer: C

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10. The natural gas based power plant in Maharashtra is at.....

A. Koyana

B. Chandrapur

C. Anjanvel

D. Tarapur

Answer: C

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11. It took millions of years for the formation of ..... fuels.

A. chemical

B. solid

C. gaseous

D. fossil

Answer: D

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12. A photoelectric cell converts_____ energy into _____ energy.

A. mechanical

B. solar

C. chemical

D. sound

Answer: B

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13. ..... is not a component of nuclear power plant.

A. control rods

B. gas turbine

C. steam turbine

D. condenser

Answer: B

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Electric Generator

1. Define

Electric generator

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2. What is a thermal power plant ?

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3. Define

Nuclear power plant

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4. What is meant by Green energy? Give examples of green energy?

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5. Define photovoltaic effect .

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6. Define

Solar panel

Watch Video Solution

7. Define

Solar string

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8. Define

Hydro-electric power plant

Watch Video Solution

9. Define

Energy

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Solve The Numerical Problems

1. In the diagrams below, silicon solar cells with dimensions 1 cm^2 are connected. Find the potential difference and electric current?

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2. In the diagrams below, silicon solar cells with dimensions 1 cm^2 are connected. Find the potential difference and electric current?

View Text Solution

3. In the diagrams below, silicon solar cells with dimensions 1 cm^2 are connected. Find the potential difference and electric current?

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4. How much potential difference and electric current we can get from 100 cm^2 dimension of silicon solar cell?

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5. One solar panel produces a potential difference of 18 V and current of 3 A. Describe how you can obtain a potential difference of 72 volts and current of 9 A with a solar array using solar panels. You can use sign of a battery for a solar panel.

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Answer The Following Questions

1. What are the different forms of energy?

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2. How is Electric energy produced?

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3. Why the energy in the coal is called as chemical energy?

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4. How does nuclear fission take place?

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5. What are the problems associated with hydroelectric power plant?

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Complete The Following Flowchart

1. Step by step Energy Conversion in thermal power plant.

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2. Step by step Energy Conversion in thermal power plant.

Watch Video Solution

3. Step by step Energy conversion in nuclear power plant.

Watch Video Solution

4. Step by step Energy conversion in nuclear power plant.

Watch Video Solution

5. Step by step energy conversion in pwer plant of natural gas.

Watch Video Solution

6. Step by step energy conversion in pwer plant of natural gas.

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7. Step by step energy conversion in hydroelectric power plant.

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8. Step by step energy conversion in hydroelectric power plant.

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9. Step by step energy conversion using wind energy.

10. Step by step energy conversion using wind energy.

11. Conversion of energy generated by solar cells to AC formed using inverter.

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12. What are solar thermal power plants?

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13. Step by step Energy Conversion in thermal power plant.

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Give Scientific Reason

1. Atomic energy is an extensive source of energy.

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2. The construction of turbine is different for different types of power plants.

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3. It is absolutely necessary to control the fission reaction in nuclear power plants.

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4. Hydroelectric energy, Solar energy and Wind energy are called renewable energies.

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5. It is possible to produce energy from mW to MW using solar photovoltaic cells

6. How can you obtain the required amount of energy by connecting solar panels?

7. In all types of thermal power plants, steam is used to rotate turbines.

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8. Boilers of the thermal power plants have tall chimneys.

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9. Though nuclear energy is an extensive source but the amount of electric power generation from nuclear power plants is much less.

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Explain The Following Statements

1. 'Save energy' is the need of the hour.

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2. Energy obtained from fossil fuels is not green energy.

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Explain With Diagram Step By Step Energy Conversion In

1. What is a thermal power plant ?

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2. Define

Nuclear power plant

Watch Video Solution

3. Hydro-electric power plant

Watch Video Solution

4. What are solar thermal power plants?

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Solve The Following Crossword Puzzle

1. (a) Maximum energy generation in India is done using ..... energy.

(b) ..... energy is a renewable source of energy.

(c) Solar energy can be called ..... energy.

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Answer Following Questios Based On Figures

1. Compare: Observe the schematic of thermal power plant and the nuclear power plant. Discuss what are the similarities and differences between the two?

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2. 

With reference to point B, potential energy of

how much water reservoir in the dam will be converted into kinetic energy?

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3. 

What will be the effect on electricity generation, if the channel taking water to turbines starts at point A?

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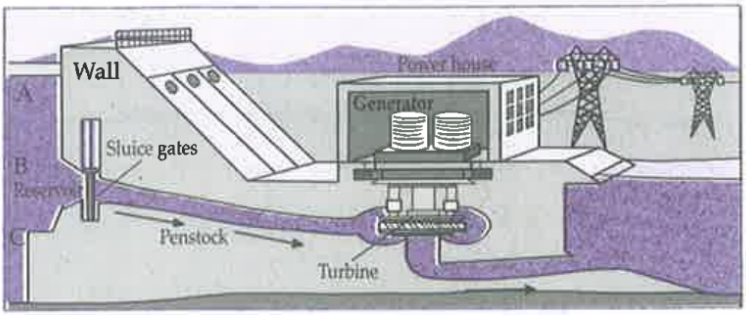

Fig 5.4. hydroelectric plant

4. What will be the effect on electricity generation, if the channel taking water to turbine starts at point C.

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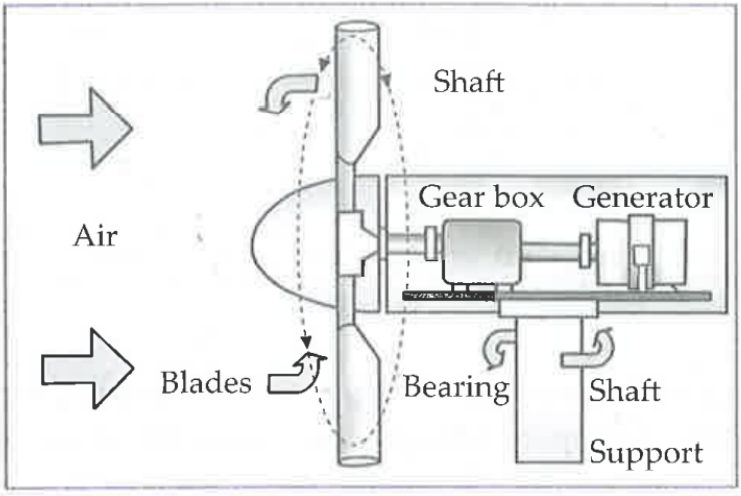

Fig 5.5 : wind mill

5. What is the process shown in the diagram?

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6. Give the principle of conservation of energy .

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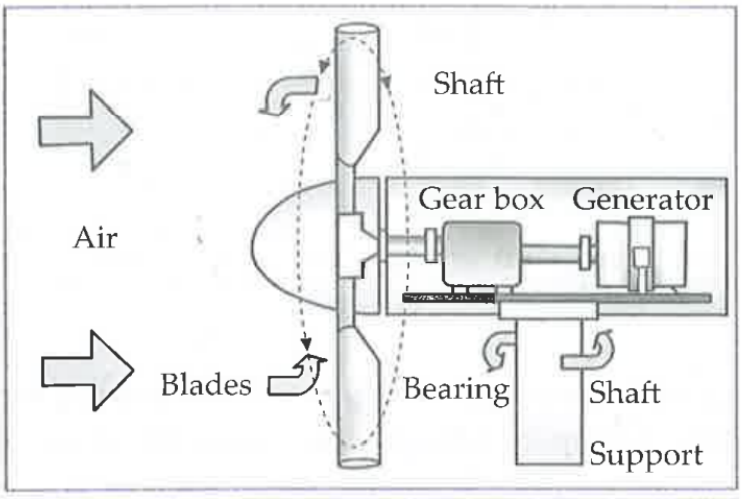

Fig 5.5 : wind mill

7. Is this process environment friendly? Explain.

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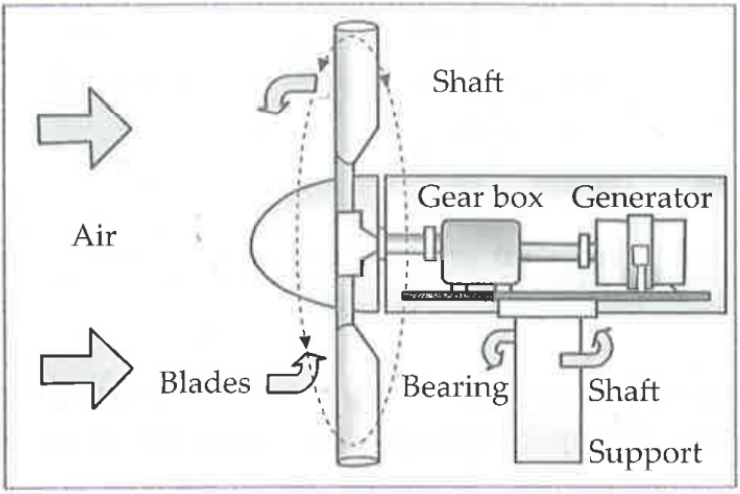

Fig 5.5 : wind mill

8. What are the disadvantages of this process?

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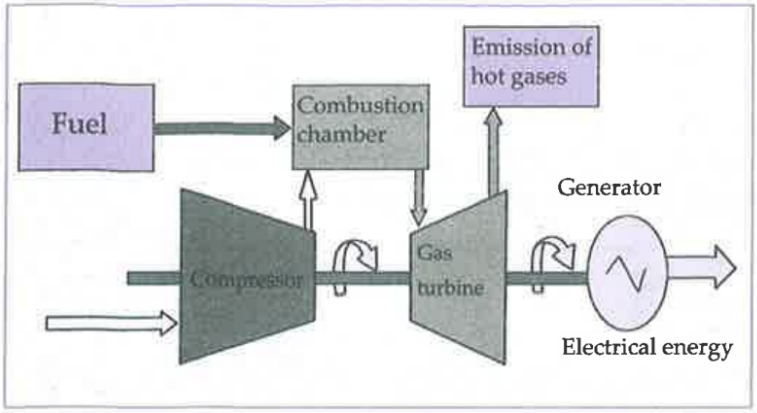
9. 

Which energy is produced?

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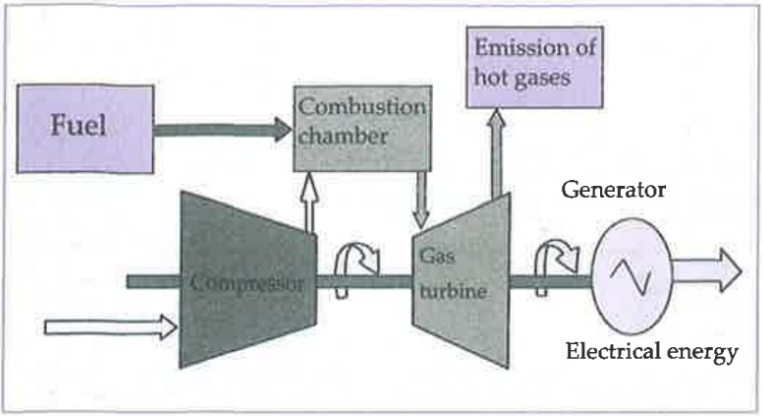

Fig. 5.6

10. What is this power plant based on?

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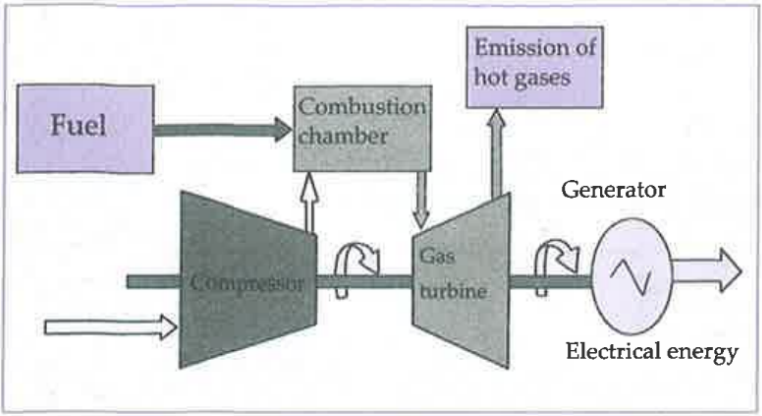

Fig. 5.6

11. Is this energy generation eco-friendly? Why?

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12.

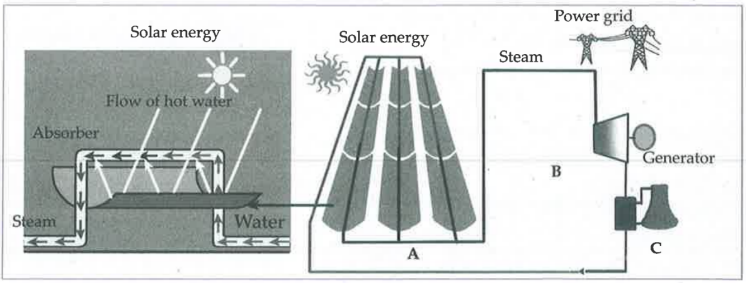

Fig. 5.9

Label A, Band C in the diagram

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13.

What is considered as a basic unit of a solar electric plant?

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14. 

What are the modules connected m senes called?

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15. 

What is the type of current obtained from a solar cell?

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16. 

What is the diagram about?

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17. An electronic device that convents D.C. Solar power into AC power is called ..... .

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18. What is the use of transformer?

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19. 

Name the power plant shown in the diagram

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20. 

Label A, B and C in the diagram.

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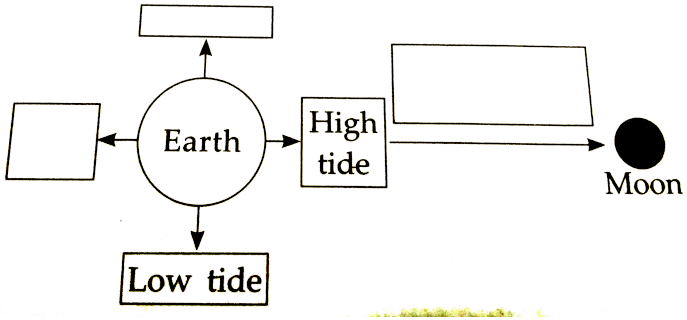
21. 

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22.

Label A and B in the diagram

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23.

Define nuclear fission.

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24.

State the drawbacks of a nuclear power plant.

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Draw Neat And Labelled Diagrams For The Following

1. What is meant by electromagnetic induction

?

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2. Define

Electric generator

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3. Series combination of solar cell.

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4. Solar cells in parallel

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5. A solar panel made from 36 solar cells.

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Answer The Following Questions In Brief

1. Which fuel is used in thermal power plant? What are the problems associated with this type of power generation?

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2. Which types of power generation involve maximumnumberof steps of energy conversion? In which type of power generation is the number minimum?

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3. Other than thermal power plant, which power plants use thermal energy for power generation? In what different ways is the thermal energy obtained?

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4. What is meant by Green energy? Give examples of green energy?

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5. Step by step Energy conversion in nuclear power plant.

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6. How can you obtain the required amount of energy by connecting solar panels?

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7. What are the advantages of solar energy?

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8. What are the limitations of solar energy?

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9. Write the advantages of Nuclear energy:

Watch Video Solution

10. Write the limitation of Nuclear energy:

Watch Video Solution

11. Give your opinion about whether hydroelectric plants are environment friendly or not?

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12. Write the advantages of wind power?

Watch Video Solution

13. Write the limitation of wind power?

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14. Write short notes on: Electrical energy generation and environment

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Assignment 5

1. A transformer transforms the ..... and current levels of the generated power.

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2. The principle of ..... was invented by Michael Faraday.

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3. State whether True or False: Water is boiled using boiler.

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4. Each nuclear fission of uranium nucleus release ..... energy.

A. 20 MeV

B. 236MeV

C. 237 MeV

D. 200 MeV

Answer:

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5. Water stored in a dam possesses

A. chemical

B. potential

C. kinetic

D. electric

Answer:

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6. Distinguish between: Biofuels and Fossil fuels.

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7. Energy obtained from fossil fuels is not green energy.

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8. How much potential difference and electric current we can get from 100 cm^2 dimension of silicon solar cell?

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9. One solar panel produces a potential difference of 18 V and current of 3 A. Describe how you can obtain a potential difference of 72 volts and current of 9 A with a solar array

using solar panels. You can use sign of a battery for a solar panel.

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10. What is a wind power?

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11. What is the use of gear box?

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12. What are various stages in electricity generation using wind energy?

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13. Advantages of hydroelectric power generation

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