



# PHYSICS

## BOOKS - S CHAND PHYSICS (HINGLISH)

### SOURCES OF ENERGY

#### Solved Examples

1. The calorific value and ignition temperature of fuel A are  $55 \text{ kJ/g}$  and  $20^\circ \text{C}$  respectively.

These values for another fuel B are 50 kJ/g and  $80^{\circ}C$  respectively. Which of the two will be more ideal fuel if, on burning, the fuel A produces  $CO_2$ ,  $SO_2$  and  $SO_3$  as by-products while the fuel B produces  $CO_2$  and  $H_2O$ ? Give two reasons in support of your answer.



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2. A student constructed a model of box-type solar cooker. He used a transparent plastic sheet to cover the open face of the box. He

found that this cooker does not function well.

What modification should he make to enhance its efficiency ? Give reason.



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**3.** The mass numbers of four different elements A, B, C and D are 2, 35, 135 and 239 respectively. Which of them would provide the most suitable fuel for (i) nuclear fission, and (ii) nuclear fusion?



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4. Hydrogen has been used as a rocket fuel.

Would you consider it a cleaner fuel *CNG* ?

Why or why not ?



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## Exercise

1. Name a non-renewable source of energy other than fossil fuels.





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2. Define calorific value of a fuel.



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3. 'The calorific value of cooking gas (LPG) is 50 kJ/g". What does it mean ?



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4. Which of the following produces more heat (per unit mass) on burning ?

Coal or LPG



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5. Define ignition temperature of a fuel.



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6. 'The ignition temperature of a fuel is  $80^{\circ}C$ .

What does this mean ?



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7. Fill in the following blank with a suitable word :

The amount of heat produced by burning a unit mass of a fuel completely is known as its ..... value.



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**8.** What is a source of energy ? What are the two main categories of the sources of energy ?



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**9.** State any four characteristics of a good source of energy.



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**10.** What is meant by a non-renewable source of energy ? Give two example of non-renewable sources of energy.



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**11.** What is meant by a renewable source of energy ? Give two example of renewable sources of energy.



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**12.** What are renewable and non-renewable sources of energy ? Give examples.



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**13.** Why are fossil fuels classified as non-renewable sources of energy ?



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**14.** Name two energy sources that you would consider to be renewable. Give reasons for your choices.



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**15.** Name two sources of energy which you consider to be non-renewable. Give reason for you choice.



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**16. (a)** Classify the following into renewable and non-renewable sources of energy :

Coal, Wind, Tides, Petroleum, Wood, Natural gas

**(b)** What is the basis of above classification ?



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**17.** Coal is said to be formed from the wood of trees. Why then is coal considered to be a non-renewable source of energy whereas wood is a renewable source of energy ?



18. (a) What is a fuel ? Give five examples of fuels.

(b) What are the characteristics of an ideal fuel (or good fuel) ?

(c ) The calorific value and ignition temperature of fuel A are 55 kJ/g and  $80^{\circ}C$ , respectively. These values for fuel B are 80 kJ/g and  $10^{\circ}C$ , respectively. On burning, the fuel A produces  $CO_2$  and  $H_2O$  while the fuel B produces  $CO_2$ ,  $CO$  and  $SO_2$ . Give three

points of relative advantages and disadvantages of these two fuels.



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**19.** An example of a renewable source of energy is :

A. petrol

B. natural gas

C. biogas

D. kerosene

**Answer: C**



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**20. A non-renewable source of energy is :**

A. wood

B. alcohol

C. hydrogen gas

D. natural gas

**Answer: D**



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**21.** Which of the following is not a renewable source of energy ?

A. wind

B. flowing water

C. fossil fuels

D. fuel wood

**Answer: C**





**22.** What is a good fuel ?

A. a high calorific value and low ignition temperature

B. high calorific value and high ignition temperature

C. high calorific value and moderate ignition temperature

D. low calorific value and moderate ignition temperature

**Answer: C**



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**23.** The fuel having a calorific value of 55 kJ/g is likely to be :

A. biogas

B. methane gas

C. hydrogen gas

D. natural gas

**Answer: B**



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**24.** A newly planted sapling usually grows and matures into a tree in more than :

A. 50 years

B. 25 years

C. 45 years

D. 15 years

**Answer: D**



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**25.** Which of the following fuels has the highest calorific value ?

A. natural gas

B. methane gas

C. hydrogen gas

D. biogas

**Answer: C**



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**26.** The fuel having the lowest calorific value is

:

A. coal

B. wood

C. charcoal

D. kerosene

**Answer: B**



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**27.** There are four fuels which all contain only carbon and hydrogen. The fuel having highest calorific value will be one which has :

A. more of carbon but less of hydrogen

B. less of carbon but more of hydrogen

C. equal proportions of carbon and  
hydrogen

D. less of carbon as well as less of  
hydrogen

**Answer: B**



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**28.** One of the following is not a characteristic of a good fuel. This is :

- A. high calorific value
- B. no emission of smoke
- C. smooth burning
- D. natural gas

**Answer: D**



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**29.** Which of the following is not a fossil fuel ?

A. coal

B. petroleum gas

C. biogas

D. natural gas

**Answer: C**



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**30.** Most of the fuels contain carbon as one of the constituents. Name a fuel which has very high calorific value but does not contain carbon.



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**31.** A hydro-power plant converts one form of energy into another. Name the two forms of energy.



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**32.** What type of energy is possessed by flowing water ?



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**33.** Flowing water can rotate a turbine. Which type of energy is used up by the turbine ?



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**34.** Name the original source of wind energy.



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**35.** What should be the minimum wind speed for the satisfactory working of a wind-powered electric generator ?



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**36.** Name some of the solar energy devices.



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**37.** Name the device which converts sunlight into electricity.



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**38.** Fill in the following blanks with suitable words :

A       solar       cell       converts.....energy  
into.....energy.





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**39.** (a) What is the difference between a thermal power plant and a hydro power plant ?

(b) Which of the two causes serious air pollution and how ?



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**40.** Compare and contrast fossil fuels and the sun as sources of energy.



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**41.** What kind of mirror-concave, convex or plane-would be best suited for use in a solar cooker ? Why ?



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**42.** What are the disadvantages of using a solar cooker ? Are there places where solar cookers would have limited utility ?



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**43.** (a) What is a solar cell ? Draw the labelled diagram of a solar cell.

(b) Name the semi-conductor material which is usually used for making solar cells.

(c ) Write the uses of solar cells.



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**44.** What are the disadvantages of using a solar cooker ? Are there places where solar



cookers would have limited utility ?



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**45.** (a) What is solar constant ? What is the value of solar constant ?

(b) If the energy received by  $5m^2$  area in 10 minutes is 4200 kJ, calculate the value of solar constant.



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**46.** How has the traditional use of wind and water energy been modified for our convenience ?



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**47.** Name the clean fuel which can be obtained from cow-dung.



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**48.** Name any three forms of energy which could be harnessed from the sea.



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**49.** Write the full form of OTE.



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**50.** What are the limitations of energy that can be harnessed from the sea ?



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51. Which of the following is not an example of a biomass energy source ?

A. wood

B. biogas

C. atomic energy

D. cow-dung

**Answer: C**



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**52.** Most of the sources of energy that we use represent stored solar energy. Which of the following is not ultimately derived from the sun's energy ?

- A. wind energy
- B. geothermal energy
- C. fossil fuels
- D. biomass

**Answer: B**



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**53.** The constituent of biogas which makes it an excellent fuel is :

A. butane

B. methane

C. propane

D. ethane

**Answer: B**



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**54. The major component of biogas is :**

A. hydrogen

B. butane

C. hydrogen sulphide

D. methane

**Answer: D**



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**55.** Which of the following is more environment friendly ?

- A. burning of diesel
- B. burning of coal
- C. burning of charcoal
- D. burning of wood

**Answer: C**





56. Which one of the following is not renewable energy technology ?

- A. solar cells
- B. windmills
- C. nuclear power
- D. tidal power

**Answer: C**



**57.** What is geothermal energy ?



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**58.** What are the advantages of nuclear energy ?



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**59.** Can any source of energy be pollution-free ? Why or why not ?



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**60.** Hydrogen has been used as a rocket fuel. Would you consider it a cleaner fuel *CNG* ? Why or why not ?



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**61.** Name two energy sources that you would consider to be renewable. Give reasons for your choices.



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**62.** Give the names of two energy sources that you would consider to be exhaustible. Give reasons for your choices.



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**63.** A solar water heater cannot be used to get hot water on :

(a) a sunny day

(b) a cloudy day

( c) a hot day

(d) a windy day.



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**64.** Which of the following is not an example of bio-mass energy source ?

(a) wood

(b) gobar gas

( c) atomic energy

(d) coal.



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**65.** Most of the sources of energy we use represent stored solar energy. Which of the following is not ultimately derived from the Sun's energy ?

(a) geothermal energy

(b) wind energy

(c) fossil fuels

(d) bio-mass.



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**66.** Compare and contrast fossil fuels and the sun as sources of energy.



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**67.** Compare and contrast bio-mass and hydro-electricity as sources of energy.



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**68.** What are the limitations of extracting energy from :

(a) the wind

(b) waves

( c) tides ?



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**69.** On what basis would you classify energy sources as :

(a) renewable and non-renewable ?

(b) exhaustible and inexhaustible ?

Are the options gives in (a) and (b) the same ?



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**70.** What are the qualities on an ideal source of energy ?



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**71.** What are the disadvantages of using a solar cooker ? Are there places where solar cookers would have limited utility ?



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**72.** What are the environmental consequences of the increasing demand for energy ? What steps would you suggest to reduce energy consumption ?



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## Hots

1. The calorific values of three fuels A, B and C are 33 kJ/g, 48 kJ/g and 150 kJ/g, respectively. A is solid, B is liquid and C is a gas at room temperature. On combustion, both A and B produce carbon dioxide while C explodes forming steam. B and C leave no residue after combustion while A leaves behind some solid residue. Which one of the three fuels is the

most ideal ? Give two reasons to support your answer.



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2. Calorific value and ignition temperature of fuel X are  $75 \text{ kJ/g}$  and  $20^\circ \text{C}$  respectively. These values for fuel Y are  $50 \text{ kJ/g}$  and  $75^\circ \text{C}$  respectively. On burning, the fuel Y produces only  $\text{CO}_2$  while fuel X produces  $\text{CO}_2$  and  $\text{CO}$ . Which of the two is a better fuel ? Give two reasons to support your answer.



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3. The calorific values of five fuels A, B, C, D and E are given below :

A 48 kJ/g

B 17 kJ/g

C 150 kJ/g

D 50 kJ/g

E 30 kJ/g

Which of the fuels could be : (i) cooking gas (ii) alcohol (iii) wood (iv) hydrogen (v) kerosene ?



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4. Arrange the following fuels in the order of decreasing calorific values (keeping the fuel with highest calorific value first) :

Biogas, Kerosene, Wood, Petrol, Hydrogen gas, Methane



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5. Arrange the following fuels in the order of increasing calorific values (keeping the fuel

with lowest calorific value first) :

LPG, Coal, Alcohol, Dung cakes, Diesel



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6. A large coal-fired power station produces 2000 MW of electrical energy. A wind turbine with 33 m blades can produce 300 kW.

How many turbines would be needed to replace the power station ?



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7. In a solar water heater, why is the storage tank placed at a higher level than the solar panel containing coils ?



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8. In many applications, solar cells are connected to rechargeable batteries. Why is this so ?



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9. (a) Solar cells are used to provide the electric current to charge the batteries of a car driven by an electric motor. Describe the energy changes which take place. (b) What differences would you expect in the charging of car batteries (i) in bright sunlight (ii) on a cloudy day (iii) at night ?



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10. A certain form of energy is available due to the difference in the temperature of water at

the surface of the ocean and its deeper levels.

(a) Name the form of energy.

(b) Is this energy ultimately derived from the sun or not ?

(c ) Explain how this form of energy can be converted into electricity.

(d) What is the minimum temperature in water at the surface of ocean and its deeper level which is required to operate power plants based on this energy ?



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11. The gravitational pull of the moon causes the sea-water to rise periodically.

(a) What name is given to the condition of the sea when its water is raised ?

(b) What name is given to the condition of the sea when its raised water recedes ?

(c ) What name is given to the energy which can be harnessed from this natural phenomenon ?

(d) Draw labelled diagram to show how this energy can be harnessed from this natural phenomenon ?





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**12.** When the material A mined from the earth is heated strongly in an insufficient supply of air, it produces a solid fuel B which consists mainly of carbon. When another material C obtained from trees is heated in an insufficient supply of air, it produces another solid fuel D which also consists mainly of carbon. Name A, B, C and D.



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**13.** A certain form of energy which is not sourced directly or indirectly from the sun and does not cause any pollution is very easily converted into electricity. This form of energy is, however, not available everywhere. Moreover, it is technically very difficult and expensive to obtain it. Name the form of energy.



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**14.** A nuclear reaction is represented by the following equation :



(a) Name the process represented by this equation and describe what takes place in this reaction.

(b) Identify the particle c and the number x of such particles produced in the reaction.

(c ) What does E represent ?

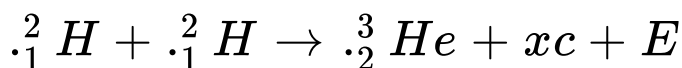
(d) Name one installation where the above nuclear reaction is utilised.

(e) What type of bomb is based on similar type of reactions ?



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15. A nuclear reaction is represented by the equation :



(a) Name the process represented by this equation and describe what happens during this reaction.

(b) Identify the particle c and the number x of

such particles produced in the reaction.

(c ) What does E represent ?

(d) State two conditions under which such a reaction takes place.

(e) What type of nuclear bomb is based on similar reactions ?



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**16.** The mass numbers of four elements A, B, C and D are 2, 20, 135 and 235, respectively. Which one of them will be most suitable to



make : (i) an atom bomb, and (ii) a hydrogen bomb ?



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**17.** A nuclear power plant is working normally. What would you do if the reactor core suddenly got too hot ?



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**18.** A nuclear reactor has half the length of all its control rods inserted in graphite. What must be done so that the reactor produces more heat ? Explain your answer.



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**19.** Explain why, in a nuclear reactor, the chain reaction stops if the control rods are fully inserted into the graphite.



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## Very Short Answer Type Questions

1. Write one use of wind energy (a) in the past  
(b) at present.



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2. Why is the copper tube of a solar water heater painted black from outside ?



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3. What type of reactions occurring inside the sun produce solar energy ?



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4. What type of reflector is used in a box-type solar cooker ?



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5. What is the range of temperature which can be achieved in a box-type solar cooker in two to three hours ?



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6. How much solar energy will be received by  $1m^2$  area in one hour if the solar constant be  $1.4 \text{ kW} / m^2$  ?



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7. What substance is obtained as a residue when wood is burned in a limited supply of air ?



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8. Name one source of energy which is not derived from solar energy directly or indirectly.



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9. What name is given to the heat energy obtained from hot rocks inside the earth ?



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10. Name the agent which decomposes animal dung into biogas.



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**11.** Which component of biogas is used as a fuel ?



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**12.** Name the constituents of biogas.



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**13.** Which of the following is needed for the formation of biogas from cow-dung and which



is not ?

Water, Oxygen



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**14.** Apart from cattle dung, what other substances can be added to a biogas plant ?



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**15.** Write two forms in which solar energy manifests itself in sea.



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**16.** What is the function of anaerobic micro-organisms such as anaerobic bacteria in a biogas plant ?



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**17.** Fill in the following blanks with suitable words :

(a) Biomass is another form in which .....

Energy manifests itself.

(b) Tidal waves build up and recede ..... a day.



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**18.** What type of nuclear reaction is responsible for the liberation of energy :

(a) in a nuclear reactor ?

(b) in the sun ?



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**19.** Which product of the nuclear fission of uranium-235 is utilised to cause further fission of its nuclei ?



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**20.** Which particles bring about the fission of uranium-235 ?



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**21.** State whether the fission of uranium-235 is caused by low energy neutrons or high energy neutrons.



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**22.** Name the type of nuclear reaction which is involved in the working of :

(a) a hydrogen bomb.

(b) an atom bomb.



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**23.** Name the moderator used in a nuclear reactor.



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**24.** Of what material are the control rods of a nuclear reactor made ?



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**25.** What do you think is the purpose of the thick, concrete chamber surrounding the reactor of a nuclear power plant ?



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**26.** Where, in a nuclear power station, is uranium used up ?



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**27.** State one use of nuclear fission reactions.



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**28.** Which of the following is not an example of connecting link ?



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**29.** How many MeV are equivalent to 1 atomic mass unit (u) ?





**30.** Fill in the following blanks with suitable words :

(a) Splitting of a heavy nucleus into two lighter nuclei is called.....

(b) Uranium-235 atoms will split when hit by.....This is called.....

(c ) Nuclear.....is used in nuclear power stations for the production of electricity.

(d) In a nuclear power station, nuclear fission takes place in the.....



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**31.** Which of the two is a cleaner fuel :  
hydrogen or CNG ? Why ?



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**32.** Which of the two is more energy efficient :  
filament type electric bulb or CFL ? Why ?



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**33.** How long are the energy resources of the earth like coal, petroleum and natural gas expected to last ?



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**34.** Name two devices which can be utilised for the cooking of food so as to save fuel.



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1. (a) Name that part of a box-type solar cooker which allows the sun's heat rays to enter the box but does not allow inside heat to go out.
- (b) Explain why, a plane mirror reflector is used in a box-type solar cooker.



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2. What is a solar cell panel ? For what purpose is it used ? State its two main advantages.



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3. How has the traditional use of wind and water energy been modified for our convenience ?



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4. (a) What is biomass ? Give three examples of biomass.

(b) Name the biomass which is still widely

used as a source of heat energy in many households of our country.



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5. What are the two ways in which cow-dung can be used as a fuel ? Which of them is better and why ?



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6. How is charcoal prepared ? Explain why, charcoal is a better fuel than wood.



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7. Compare and contrast bio-mass and hydro-electricity as sources of energy.



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8. Why is biogas considered an ideal fuel for domestic use ?



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9. (a) Explain how tidal energy can be used to generate electricity.

(b) Why is tidal energy not likely to be a potential source of energy ?



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10. What is meant by ocean thermal energy



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11. Suggest a safe and efficient method for the disposal of biowastes and sewage materials.  
How is this method advantageous to us ?



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**12.** Which of the following sources of energy are not derived from the sun ?

Biomass, Wind, Ocean thermal energy,  
Geothermal energy, Nuclear fuels,  
Hydroelectricity, Wave energy, Coal, Petroleum,  
Tidal energy



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**13.** What is nuclear fission ?



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**14. (a)** What is nuclear fusion ? Explain with an example. Write the equation of the reaction involved.

**(b)** Why are very high temperature required for fusion to occur ?



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**15.** What is the nuclear fuel in the sun ? Describe the process by which energy is

released in the sun. Write the equation of the nuclear reaction involved.



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**16. (a)** Write Einstein's mass-energy equation.

Give the meaning of each symbol which occurs in it.

(b) If 25 atomic mass units (u) of a radioactive material are destroyed in a nuclear reaction, how much energy is released in MeV ?



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17. (a) What is the source of energy of this sun and other stars ?

(b) Describe the working of a hydrogen bomb.

(c ) What is common between the sun and a hydrogen bomb ?



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18. (a) What will happen if slow moving neutrons are made to strike the atoms of a heavy element  ${}_{92}^{235}\text{U}$  ? What is the name of

this process ?

(b) Write a nuclear equation to represent the process which takes place.

(c ) Name one installation where such a process is utilised.



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**19.** (a) What are the advantages of nuclear energy ?

(b) State the disadvantages of nuclear energy.



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**20.** The following questions are about the nuclear reactor of a power plant.

(a) Which isotope of uranium produces the energy in the fuel rods ?

(b) Will the fuel rods last for ever ?

(c ) Is the energy produced by nuclear fission or nuclear fusion ?

(d) What is the purpose of using the graphite moderator ?

(e) What is the function of boron rods in the nuclear reactor ?

(f) Why is liquid sodium (or carbon dioxide gas) pumped through the reactor ?



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**21.** In the reactor of a nuclear power plant, name the material which is used :

(a) as a moderator (b) to absorb radiations (c )  
in the fuel rods

(d) in the control rods (e) to carry away heat



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**22.** In the nuclear reactor of a power plant :

(a) how do control rods control the rate of fission ?

(b) how is heat removed from the reactor core, and what use is made of this heat ? '



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**23.** How does inserting the control rods in the graphite core affect the fission in the reactor ?

Explain your answer.



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**24.** What are the advantages and disadvantage of using nuclear energy ?



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**25.** What are the various factors which we should keep in mind while choosing a source of energy ?



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**26.** Can any source of energy be pollution free ? Explain your answer with an example.



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**27.** How are the environmental consequences of the increasing demand for energy ?



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**28.** What steps would you suggest to reduce energy consumption ?



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## Long Answer Type Questions

**1. (a)** What is hydroelectricity ? Explain the basic principle of generation of hydroelectricity with the help of a labelled diagram.

(b) State two advantages of producing hydroelectricity.

(c ) State two disadvantages of producing hydroelectricity.



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2. (a) With the help of a labelled diagram, explain the construction and working of a solar cooker.

(b) Why is the solar cooker box painted black from inside ?

(c ) Why is the solar cooker box covered with a glass sheet ?



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**3. (a)** What is wind ? What type of energy is possessed by wind ?

(b) Explain how, wind energy can be used to generate electricity. Illustrate your answer with the help of a labelled diagram.

(c ) State two advantages of using wind energy for generating electricity.

(d) Mention two limitations of wind energy for generating electricity.



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4. (a) What is biogas ? Name the major component of biogas.

(b) What are the raw materials used for making biogas ?

(c ) Describe the construction and working of a biogas plant with the help of a labelled diagram.

(d) Write any two uses of biogas.

(e) Write any two advantages of using biogas.



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5. (a) What is geothermal energy ?

(b) What is the source of heat contained in geothermal energy ?

(c ) Explain how, geothermal energy is used to generate electricity.

(d) State two advantages of geothermal energy.



(e) State two disadvantages of geothermal energy.



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6. (a) What is a nuclear reactor ? What is the fuel used in a nuclear reactor ?

(b) With the help of a labelled diagram, describe the working of a nuclear power plant.

(c ) How is the working nuclear reactor of a power plant shut down in an emergency ?

(d) Name five places in India where nuclear power plants are located.



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7. (a) Differentiate between nuclear fission and nuclear fusion.

(b) Which of the two, nuclear fission and nuclear fusion, is made use of :

(i) for the production of electricity ?

(ii) for making a hydrogen bomb ?

(c ) Which produces more energy : nuclear

fusion or nuclear fission ?

(d) Calculate the energy released in joules when 5 g of a material is completely converted into energy during a nuclear reaction.

(e) How much is this energy in MeV ? (Speed of light =  $3 \times 10^8 \text{ m/s}$ )



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**Mcq**

1. A solar water heater cannot be used to get hot water on :

- A. a sunny day
- B. a cloudy day
- C. a hot day
- D. a windy day

**Answer: B**



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2. In a hydro power plant :

A. kinetic energy possessed by stored water is converted into electrical energy

B. electricity is extracted from water.

C. water is converted into steam to turn turbines and produce electricity

D. potential energy possessed by stored water is converted into electricity.

**Answer: D**



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3. Which of the following is transcriptionally active protein ?

- A. plane mirror reflector
- B. black coating inside the box
- C. glass sheet cover
- D. utensils placed in the cooker box

**Answer: C**



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4. Solar cells are made of :

A. conductors

B. insulators

C. semi-conductors

D. super-conductors

**Answer: C**



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5. The value of solar constant is :

A. 1.4 kWh

B. 1.4 kW/m

C.  $1.4kW / m^2$

D.  $1.4kW / m^3$

**Answer: C**



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6. The radiations present in sunlight which make a solar cooker work are :

A. visible light rays

B. ultraviolet rays

C. cosmic rays

D. infrared rays

**Answer: D**



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7. In order to make an efficient solar cooker, the cover of cooker box should be made of :

A. transparent plastic sheet

B. shining aluminium sheet

C. butter paper sheet

D. transparent glass sheet

**Answer: D**



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8. The minimum speed of wind necessary for the satisfactory working of a wind generator to produce electricity is about :

A. 15 km/h

B. 25 km/h

C. 35 km/h

D. 45 km/h

**Answer: A**



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9. If the solar constant is  $1.4 \text{ kW} / \text{m}^2$ , then the solar energy received by  $1 \text{ m}^2$  area in one hour is :

A. 5040 J

B. 504.0 kJ

C. 5040 kJ

D. 5.04 kJ

**Answer: C**



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**10.** A solar cooker may not cook food if :

A. the solar cooker is not placed in the shade

B. the glass sheet cover of solar cooker is not closed

C. a convex mirror reflector is not used

D. the food containers of insulating material are not used

**Answer: B**

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**11.** The rise of sea-water during high tide is caused by the gravitational pull of the :

A. Sun

B. Earth

C. Moon

D. Mars

**Answer: C**



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12. One of the following is not a required in the formation of biogas in a biogas plant. This is :

A. cow-dung

B. water

C. oxygen

D. anaerobic bacteria

**Answer: C**



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**13.** The fuel which is not obtained from biomass is :

A. firewood

B. cow-dung cakes

C. coke

D. charcoal

**Answer: C**



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**14.** The non-renewable source of energy among the following is :

A. hydroelectricity

B. sewage gas

C. natural gas

D. gobar gas

**Answer: C**



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**15. Geothermal energy is**

- A. fission of radioactive materials
- B. burning of coal inside the coal mines
- C. combustion of natural gas deep inside the earth
- D. fusion of radioactive substances

**Answer: A**



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**16.** The harnessing of which of the following leads to the destruction of large eco-systems ?

A. thermal power

B. tidal power

C. hydro power

D. geothermal power

**Answer: C**



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17. Which of the following is not a consequence of establishing hydroelectric power plants ?

- A. displacement of people
- B. production of methane
- C. occurrence of floods
- D. ecological disturbance

**Answer: C**



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**18.** Which of the following is used as a moderator in the reactor of a nuclear power station ?

A. liquid sodium

B. boron

C. graphite

D. carbon dioxide

**Answer: C**



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**19.** The control rods used in the reactor of a nuclear power plant are made of :

A. steel

B. graphite

C. uranium

D. boron

**Answer: D**



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**20.** The 'coolants' which can be used in the reactor of a nuclear power station are :

- A. liquid mercury and nitrogen dioxide
- B. liquid sodium and carbon dioxide
- C. liquid ammonia and carbon monoxide
- D. liquid boron and uranium oxide.

**Answer: B**



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21. In a nuclear power plant, coolant is a substance :

A. which cools the hot, spent steam to  
condense it back to water

B. which transfers heat from reactor to  
water in heat exchanger

C. which is boiled to make steam to turn  
the turbine



D. which cools the generator coils to prevent their overheating.

**Answer: B**



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**22.** Which of the following is ultimately not derived from the sun's energy (or solar energy)

A. wind energy

B. nuclear energy

C. biomass energy

D. ocean thermal energy

**Answer: B**



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**23.** 1 atomic mass unit is equal to

A. 931 eV

B. 9.31 MeV

C. 1 MeV

D. 931 MeV

**Answer: D**



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**24.** The energy in the reactor of a nuclear power station is produced by the process of :

A. nuclear diffusion

B. nuclear fission

C. nuclear fusion

D. nuclear fermentation

**Answer: B**



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**25.** One eV (electron volt) of nuclear energy is equivalent to :

A.  $1.6 \times 10^{-14} J$

B.  $1.6 \times 10^{-12} J$

C.  $1.6 \times 10^{-19} J$

D.  $1.6 \times 10^{-13} J$

**Answer: C**



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**26.** Which of the following can be produced during the nuclear fission as well as nuclear fusion reactions ?

A. protons

B. neutrons

C. electrons

D. neutrons

**Answer: D**



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**27.** Nuclear fission reactions are not a source of energy for one of the following. This is :

A. atom bomb

B. power plants

C. sun

D. pacemaker

**Answer: C**



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**28.** The energy produced by converting 1 gram mass of a nuclear fuel into energy completely is :

A.  $9 \times 10^{16} J$

B.  $9 \times 10^{14} J$

C.  $9 \times 10^{15} J$

D.  $9 \times 10^{13} J$

**Answer: D**



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**29.** The source of energy of the sun is

A. conversion of hydrogen gas into helium



B. conversion of carbon fuel into carbon dioxide

C. burning of hydrogen gas present in the sun

D. disintegration of uranium into barium and krypton

**Answer: A**



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**30.** An uncontrolled nuclear chain reaction in nuclear fission forms the basis of :

- A. nuclear power plant
- B. hydrogen bomb
- C. thermal power station
- D. atom bomb

**Answer: D**



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31. One MeV of nuclear energy is equivalent to  
:

A.  $1.6 \times 10^{-13} J$

B.  $1.6 \times 10^{-19} J$

C.  $1.6 \times 10^{-16} J$

D.  $1.6 \times 10^{-15} J$

**Answer: A**



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**32.** One type of energy which has not been controlled so far is :

A. ocean thermal energy

B. nuclear fusion energy

C. geothermal energy

D. nuclear fission energy

**Answer: B**



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**33.** The disposal of wastes produced in a nuclear power plant poses a big problem because it is :

A. too heavy

B. highly inflammable

C. extremely foul smelling

D. highly radioactive

**Answer: D**



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**34.** The heat energy released during nuclear fission and fusion is due to the :

A. conversion of stored chemicals into energy

B. conversion of momentum into energy

C. conversion of mass into energy

D. conversion of magnetism into energy

**Answer: C**



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**35.** Which of the following can undergo nuclear fusion reaction ?

A. uranium

B. deuterium

C. barium

D. krypton

**Answer: B**



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**36.** The major cause of environmental pollution is the use of :

A. hydrogen as fuel

B. biomass energy

C. ocean energy

D. fossil fuels

**Answer: d**



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**37.** The world's known coal reserves are expected to last for about :

A. 200 years

B. 400 years

C. 500 years

D. 100 years

**Answer: a**



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**38.** The fossil fuel whose known reserves in the earth are expected to last for the minimum period is :

A. coal

B. uranium

C. petroleum

D. natural gas

**Answer: c**



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**39.** An energy efficient device for producing light is :

A. DLF

B. CFL

C. FCL

D. LPG

**Answer: b**



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1. What is a source of energy ? What are the two main categories of the sources of energy ?



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2. What is a good fuel ?



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**3.** If you could use any source of energy for heating your food, which one would you use and why ?



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**4.** What are the disadvantages of fossil fuels ?



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5. Why are we looking at alternate sources of energy ?



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6. How has the traditional use of wind and water energy been modified for our convenience ?



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7. What kind of mirror-concave, convex or plane-would be best suited for use in a solar cooker ? Why ?



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8. What are the limitations of energy that can be obtained from the oceans ?



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