CBSE Test Paper 04

Chapter 14 Sources of Energy

1. What is the full from of OTEC **(1)**

i. Other traditional energy crisis
ii. Ocean themed energy cooperative
iii. Ocean thermal energy conversion
iv. Ocean thermal energy corporation

2. Match the following with correct response. **(1)**

(1) Fuel burns without smoke	(A) Anaerobic fermentation
(2) Material suitable for producing biogas	(B) Coke
(3) Production of biogas by biomass	(C) Spent slurry
(4) Manure	(D) Paper scrap

i. 1-D, 2-A, 3-C, 4-B
ii. 1-B, 2-D, 3-A, 4-C
iii. 1-A, 2-C, 3-B, 4-D
iv. 1-C, 2-B, 3-D, 4-A

3. LPG is better fuel than kerosene because- **(1)**

A. LPG has low calorific value
B. LPG does not Produce smoke
C. LPG does not leave any ash
D. It has high ignition temperature

i. B and C
ii. A and C
iii. A and B
iv. All of these

4. Match the following with correct response. (1)

(1) A semiconductor is used to develop electric power	(A) Solar concentrations
(2) Indirect harnessing of solar energy	(B) Hydel power plant
(3) Can be harnessed 24 hours through out the year	(C) Solar cells
(4) The temperature in the region of focus is very high	(D) Geothermal energ

i. 1-A, 2-C, 3-B, 4-D
ii. 1-D, 2-A, 3-C, 4-B
iii. 1-C, 2-B, 3-D, 4-A
iv. 1-B, 2-D, 3-A, 4-C

5. The glass cover used in a solar cooker, help us to have the_____effect in it. **(1)**

i. White house.
ii. Black house
iii. Blue house
iv. Green house

6. How is the slurry left in a bio-gas plant, in the end, used? **(1)**

7. Write the drawback of energy obtained from fusion.

8. What is a chain reaction? **(1)**

9. Write two different ways of harnessing energy from ocean. **(1)**

10. Why are many thermal power plants set up near coal or oil fields? (**3)**

11. a. Name the device used to convert **(3)**

i. Solar energy in to heat and
ii. solar energy in to electricity.

b. Explain the working of windmill

12. Reena's father works with a company that builds dams. Once he took her to the site, where a dam was being build. Reena saw a group of people sitting there and shouting slogans against the building of dam. She talked to the group of people and asked them about their problems and then discussed it with her father. She then tried to convince

people to talk with the authorities and come to an amicable solution. The discussion was successful. Reena's father was very proud of his daughter. Now, answer the following questions: **(3)**

i. Why was Reena's father proud of his daughter?
ii. Why was the group of people protesting against the building of the dam?
iii. Reena's contribution to the peaceful resolution of the conflict proved a boon for many citizens of the country. How?

13. Why is biogas a better fuel than animal dung cakes? **(3)**

14. What are environmental consequences of the increasing demand for energy ? What steps would you suggest to reduce energy consumption ? **(5)**

15. What is a role of fuel in everyday life ? **(5)**

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Answers

1. c. Ocean thermal energy conversion

   Explanation: Ocean thermal energy conversion is a process that can produce electricity by using the temperature difference between deep cold ocean water and warm tropical surface waters.

2. b. 1-B, 2-D, 3-A, 4-C

   Explanation:

   i. **Fuel burns without smoke is Coke**---**Coke** is a **fuel** with few impurities and a high carbon content, usually made from coal. It is the solid carbonaceous material derived from destructive distillation of low-ash, low-sulphur bituminous coal. Cokes made from coal are grey, hard, and porous. ... **Coke** is also used to manufacture water **gas**

   ii. **Material suitable for producing biogas is Paper scrap**---**Biogas** means a gas produced by the anaerobic digestion or fermentation of organic matter. The organic matter can be manure, sewage sludge, municipal solid waste, biodegradable waste or any other biodegradable feedstock. **Biogas** is mainly methane and carbon dioxide

   iii. **Production of biogas by biomass is by Anaerobic fermentation**--**Biogas** is a biofuel produced from the anaerobic fermentation of carbohydrates in plant material or waste (eg food peelings or manure) by bacteria. It is mainly composed of methane, with some carbon dioxide and other trace gases.

   iv. **Manure is Spent slurry**---Bio-Gas produced is also **used** for Power Generation with the help of genset. The Biogas plant **Spent Slurry** (rich in nutrients than fresh cow dung) is **used** as Manure for plantation in gaushala and all around it and this **slurry** is also vermin-composted and marketed

3. a. B and C

Explanation: LPG is a good fuel with high calorific value, burns with a smokeless flame, does not produce any poisonous gases on combustion and do not cause pollution

4. c. 1-C, 2-B, 3-D, 4-A

Explanation:

1. **A semiconductor is used to develop electric power is Solar cell---Construction** and working of **Solar Cell**. It essentially consists of a silicon PN junction diode(semiconductor) with a glass window on top surface layer of P material is made extremely thin so, that incident light photon's may easily reach the PN junction. When these photons collide with valence electrons
2. **Indirect harnessing of solar energy is from Hydel power plant----** Hydroelectric energy can be defined as a form of **hydropower** where the motion of running water (kinetic energy) is converted into electricity. The water cycle is driven directly by solar energy. When the sun heats the water in the ocean, some of the water on the surface is vaporized
3. **Can be harnessed 24 hours through out the year is Geothermal energy--Geothermal energy** is the heat from the Earth. It's clean and sustainable. Resources of **geothermal energy** range from the shallow ground to hot water and hot rock found a few miles beneath the Earth's surface, and down even deeper to the extremely high temperatures of molten rock called magma
4. **The temperature in the region of focus is very high in Solar concentrations--Concentrated solar power** (also called **concentrating solar power**, **concentrated solar** thermal, and **CSP**) systems generate **solar power** by using mirrors or lenses to **concentrate** a large area of sunlight, or **solar** thermal energy, onto a small area.

5. d. Green house

Explanation: The glass sheet in the solar cooker creates a greenhouse effect. Glass sheet has a property that allows the infrared rays of shorter wavelength from the sun to get in the device but does not allow the IR rays of longer

wavelength to leave the solar heating device.

6. The slurry left behind is removed periodically and is used as excellent source of manure, rich in nitrogen and phosphorous.
7. The energy from fusion cannot be controlled.
8.
   - A. chemical reaction or other process in which the products themselves promote or spread the reaction.
   - The self-sustaining fission reaction spread by neutrons which occurs in nuclear reactors and bombs.
9. The two ways by which ocean energy can be harnessed are:
   a. Wave energy.
   b. Tidal energy.
10. Thermal Power plant is a power plant where steam is ued to drive a steam turbine and the heat required for the process is obtained from coal and oil .The thermal power plants are usually set up near coal or oil fields so that the fuel can be easily obtained and the problem of air pollution while transporting the fuel may be minimized.
11. a. i. Solar cooker
    ii. Solar cell.
    b. When the wind blows with a minimum speed of 15km/hr, the kinetic energy of the wind is used to rotate the blades of wind mill. The mechanical energy of the rotating blades is used to rotate the armature of the generator and generator in turn produces electricity.
12. i. Reena's father was very proud of his daughter because she resolved the conflict peacefully and smartly.
    ii. One of the major disadvantages of the construction of dams is the dislocation of local people. That's why the local people were protesting against it.
    iii. Reena acted as a bridge between the local people and the authorities. She helped authorities by convincing people for discussions with them. She also played a major role in the construction of dam which then helped in controlling flood in river and also in irrigation.
13. Biogas is a better fuel than animal dung cakes because:
    i. Burning of animal dung cake produces smoke which causes lot of pollution whereas biogas is a smokeless fuel.

ii. The calorific value of animal dung cake is much lower than that of biogas.
iii. Animal dung cakes leave residue after burning whereas biogas leaves no residue.

14. The demand of energy is increasing day by day. Exploiting any source of energy may disturb the environment in one way or other. For example getting energy from fossil fuel may cause lot of pollution in air. Getting energy by nuclear fission may create problem of disposal of nuclear waste. Steps for reducing energy consumption should be such that we get maximum energy from least fuel. For this:
    i. Under the given situation technology utilized should be the best possible. For example using smokeless chulhas should be preferred to traditional chulhas.
    ii. Energy should be extracted by most economic method under the given situation. Whereas energy extraction by solar cell may be useless in big towns due to cost factor, it may be indispensable for artificial satellites.
    iii. Wastage of energy should be strictly avoided. Energy saves is equal to energy produced.
    iv. Sources of energy should be such that it causes the lease damage to environment.
15. Fuels play very important role in our everyday life because we use several types of fuels for our different requirements. Theses are discussed below:
    i. **For domestic use :** Fuels like wood, coal, kerosene, domestic gas, cow-dung, charcoal etc. are used in our homes for cooking food and other domestic heating purposes.
    ii. **For transport :** Coal, diesel and petrol are used to run the transport. For example, petrol is used in running light vehicles such a scooters, motor-cycles, cars etc. Diesel oil is used in running heavy vehicles, such as trucks, buses, tractors, railway engines, tanks etc.
    iii. **In Industries :** Fuels like coal, fuel oil or natural gas are used in industries to heat up boilers.
    iv. **To generate electricity :** Fuels like coal or natural gas are used in thermal power plants to generate electricity.
    v. **As rocket fuel :** Some special types of fuels such as hydrazine, liquid hydrogen, etc. are used in rockets. These types of fuels used in rockets are called propellants. Thus, fuels play a pivotal role in our lives by helping us in different areas.