SBG STUDY

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CH - 3
SOURCES OF ENERGY.

☆ Assignment - 1

Ques 1 Why do we need energy?

Ans All of us need energy to work, to grow and to sustain life.

Ques 2 If somehow we put together the heat and light generated along with other products during burning of candle (Carbon dioxide, water vapour etc.) Can we get back chemical energy in form of wax? Give reasons.

Ans If we light a candle the chemical energy in wax is converted to heat energy and light energy on burning. Now when we put together heat and light energy to get back the chemical energy in form of wax. NO. and it gives back wax

Ques 3 In which form is energy required to meet our requirments. usually available to us?

Ans Mechanical energy, muscular energy, chemical energy electrical energy, heat energy

Ques 4 Why are fossil - fuel considered to be non- renewable source of energy?

Ans These were exhausted in future that they are called of non - renewable source of energy.

Ques 5 What is meant by convential source of energy? Give example?

Ans # Convential energy :- The traditional source of energy which are extensively used due to their easy availability and also met a major portion of our energy requirement is called convential energy.

Ex - fossil fuel and hydro energy.

Ques 6 Give two examples of each

(a) Solid fuel.

Ans Coal, coke, wood.

(b) Liquid fuel.

Ans Petrol, Kerosene, alcohol etc.

(c) Gaseous fuel

Ans Natural gas, LPG, Coal gas etc.

Ques 7. What energy transformation takes place when.

(a) a candle lighted

Ans. Chemical energy to heat energy.

(b) A Plate is dropped from a height

Ans. Potential to kinetic energy.

(c) A Electric bulb is lighted

Heat Electrical energy to heat energy.

Ques 8. Is there is any way of collecting all heat lost to environment by 100 ml of water at temp. of 100°C when cooled down to room temp. in room? Give reason.

Ans NO it cannot collect but Any energy is used to do work is called usable energy. So, when any work has done, some usable engy is converted to unusable energy. That is unusable energy which does not perform any work and ulimetely gets lost in surrondis. it cannot use again.

Ques 9. How are the sources of energy classified on basis of recycling Period?

Ans All the Sources of energy can be classified into two main categories on basis of recycling Period.

1. Renewable source of energy.
2. Non-renewable source of energy.

Ques 10. Why is solar energy considered to be renewable source of energy?

Ans Renewable sources of energy will be continuously as their supply is unlimited. and solar energy is unlimited

Ques 11 How are the sources of energy classified on basis of usability?

Ans they are classified on usability as that which unlimited they are called renewable and for limited priod. ~~and~~ re are called non-renewable energy and on the recyding period.

Ques12 what is meant of a Non-Convential Source of energy. Give two example.

Ans The traditional source of energy which are not extensively and meet our energy requirment on limited scale are called Non-Convential Source of energy.
ex. Solar energy and Ocean energy etc.

Ques13. what is fuel? Give two example of fuel?

Ans A combustile substance which on burning in air produces a large amount of heat energy is called as fuel.
Example:- LPG, Coal etc.

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Ques1 Name a non- renewable convential source of energy.

Ans Fossil fuel

Ques2 CNG is used in cars instead of Petrol because it is:-

Ans More economid.

Ques3. Can we call a fuel an "Source of energy"? Give reasons.

Ans It is call as source of energy because In Cars we use Petrol/Diesel by that our car can move and source of energy is that which provide an adequate ~~energy~~ amount of (useful) energy at steady rate over long period of time.

Ques4. Why is CNG is better fuel than Kerosene?

Ans Because it a good for economically good. and not do much pollution that Kerosene both were used in Cars but CNG is mostly used.

Ques5 Why would you use LPG for heating your food. instead of wood.

Ans 1. It burns without giving harmful gases.
2. It does not leave any ash after burning.
3. It has high Calorific value

Quess What are difference b/w renewable and Non-renewable source of energy?

Ans.

	Renewable	Non-Renewable
1. Nature:	The source of energy are inexaustible and can be used be renewed after short period of time are called renewable.	The source of energy which are exhaustible and cannot renewed after short interval of time are called non-renewable.
2. Availibilty	They are continuously availabl	They will be exhausted one day
3. Renewal	They were quickly replaced after being used.	They cannot quickly replaced after being used.
4. Period Of formation	They take short period of formation	They take millions of years for their formation
5. Environmental pollution.	They donot causes ang E.P.	They cause E.P.
6. Conser-vation	we need not to conserve these	We need to conserve them.
Ex	Solar energy	Coal, Petroleum

Ques 6 Coal is said to be formed from wood of trees why is then coal considered to be non-renewable. whereas wood regarded as renewable?

Ans.

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☆ HOME ASSIGNMENT.

Qus1 write characteristics of good source of energy?

Ans: 1. It should be economically and easily available.
2. It should burn at a moderate and steady rate, it should not burn either too fast and slow.
3. It should not produce any poisonous and irrating fumes or smoke during burning.
4. It should not leave much ash after burning.
5. It should produce large amount of heat per unit mass i.e. it have high calorific value
6. It should be easy to handle, safe to transport and Conveint to store
7. It should have a proper ignitation temp. (room temp.) so that it can be burnt easily.
8. It should not be valueable for some other purpose. than a fuel ex. charcoal.

Qus2. why is LPG considered a better fuel for household kitchen use?

Ans 1. It burns without giving out harmful gases.
2. It donot leave any dry ash after burning.
3. It has high calorific value.
4. It is economically good

Ques 3. what is meant by ~~Non-~~ renewable source of energy? Give Ex.

Ans :- Non- Renewable :-

Those sources of energy which are inexhaustible, i.e. which can be renewed after short interval of time are called Non- renewable.

Ex: wood and solar energy etc.

Ques 24. what is meant by ~~Re~~ Non- Renewable source of energy? Give example?

Ans Non- Renewable :-

The sources of energy which are exhaustible i.e. which cannot be renewed or replaced in short intervals of time are called non- renewable

Ex- Coal and Petroleum etc.

Ques 4. which is better fuel b/w A and B - study table & answer

Fuel	calorific value	Ignitation temp	Products obtained
A	75 KJ/Kg	25°C	CO_2, Co, Ash
B	50 KJ/Kg	75°C	CO_2

Ques 6 What are difference b/w Convential and non- convential Source of energy?

Ans

Parameter	Conventional	Non-Conventional
1. Usage	These sources of energy are extensively used.	These sources of energy are not extensively used.
Energy requirement	They meet a major Portion of our energy requirment	They meet requirment of energy on small scale.
Future prospect	Most of Conventional source are expected to be exhausted in future.	Most of Non- Conventional source have continuously availability on earth
Ex:-	Fossil fuel, hydro-energy etc.	Solar energy, Ocean energy etc.

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☆ Assignment - 2.

Ques 1 What are fossil fuel?

Ans The fuels formed from the prehistoric remains of dead plants and animals buried deep under earth's crust under special conditions are called fossil fuel.

Ques 2 How is combustion of fossil fuel responsible for acid rain?

Ans Fossil fuel contains sulphur, which produces sulphur dioxide on burning. Besides being a poisonous gas, it dissolves in atmospheric water to form sulphuric acid which falls on earth along with rain. This rain known as acid rain, damage crops, harm living tissues and corrodes metal and marbles of building.

Ques 3 Name any four poisonous substances released by burning of fossil fuels.

Ans 1. Carbon Monoxide
2. Sulphur dioxide
3. Nitrogen
4. Carbon dioxide

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✡ WORKSHEET.

Qus1 The greenhouse effect gas released by combustion of fossil fuel is.

Ans CO_2

Qus2 Electrostatic precipitators used in industries remove which of following from smoke?

Ans SPM

Qus3 Combustion of fossil fuels in an insufficient supply of oxygen forms

Ans Carbon Monoxide

Qus 4 why are fossil fuels classified as non-renewable sources of energy?

Ans Fossil fuel are classified as non-renewable source of energy because if exhausted, they cannot be regenerated (replenished) in short time as they take millions of years to form again

Qus 5 How does combustion of fossil fuel cause increasing green house effect?

Ans The combustion of fossil fuel ~~cause~~ produces carbon dioxide which is released in atmosphere and carbon dioxide has tendency to absorb infared radiations radicted by earth resulting in warming of earth's atmosphere. This called Greenhouse effect. Large concentration of carbon dioxide in atmosphere due to excessive use of fossil fuel would increase the greenhouse effect, leading to unnatural global warming.

Ques 6. What do industries use to remove suspended Particle matter from gases released by it?

Ans. The burning of carbon containing fuels release ash and fine particles of unburnt cabon in the air. These fine particles called SP.M. are very harmful.

✡ HOME ASSIGNMENT

Ques1 How is air pollution caused by burning of fossil fuel?

Ans. The Pollution caused by burning of fossil fuel can be

1. Green house effect.
2. Combustion of fossil fuel in an sufficient supply of oxygen forms Carbon monoxide which poisnous. it cause suffocation or death.
3. The Acid Rain which damage crops & harm living tissues and corrods metals and marbls by combusting fossil fuel.
4. The oxides of nitrogen give off from exhausts of engines of vehicles are poisonous. Vehicles are now fitted with catalytic converters.
5. The burning of carbon containing fuels release ash and fine Particles. this are SPM.
6. The exhaunds of vehicle release lead compounds

Ques 2 What are methods to reducing air pollution caused by burning fossil fuel?

Ans 1. Efficient internal combustion engines.
2. Catalytic converter
3. Scrubbers and electrostatic precipitators.

Ques 3 why are Catalytic Converters fitted in new cars?

Ans Catalytic converters are fitted in new cars which converts these gases to harmless ones.

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✡ Assignment - 4

Ques 1: what is meant by 'energy from biomass'? Give three examples.

Sol: Energy from biomass, we mean energy derived from remains of living organism and from the excreta of animals.

Ques 2: When is wood considered to be renewable source of energy?

Ans: Wood is a renewable source of energy to some extent, if we can ensure that enough trees are planted.

Ques 3: How is charcoal obtained?

Ans: Charcoal is prepared by strong heating of wood in closed vessel in a limited supply of air (oxygen). when wood is heated strongly in a closed vessel in limited supply of oxygen, then water and volatile material present in it get removed and a black residue called charcoal is left behind. This process is called destructive distillation of wood.

Ques 4: How is biogas obtained?

Ans: Biogas is obtained by anaerobic decomposition of cow dung in the presence of water.

Ques 5: what is meant by firewood?

Ans: when wood was used as fuel is called fire wood.

Ques 6: what are the disadvantages of burning cow dung directly as fuel?

Ans ✡ Disadvantages of burning cow-dung directly as fuel.

1. Cow dung contains important nutrients like nitrogen and phosphorus which are required by soil for proper growth and development of crops growing in soil. So, burning of cow-dung as fuel destroys these useful nutrients which otherwise have been used in agriculture.
2. Cow dung cakes have low calorific value. So, we need a large amount of cow dung cakes to obtain the required heat.
3. Cow dung cake do not burn completely and produce a lot of ash as residue.
4. Cow dung cake produce a lot of smoke and harmful gases on burning which cause air pollution.

Ques 7 : why does biomass as fuel have poor efficency?

Ans : biomas as fuel have poor efficency it depends on how they converted into power, heat, fuel and chemicals using a variety of thermochemical and biochemical methods. efficiency of biomass production by photosynthesis is very low

Ques 8 : why is charcoal an expensive fuel compared to wood?

Ans. Charcoal is expensive compared to wood because when we convert 1 Kg wood into charcoal we only get 250g charcoal and its calorific is 33KJ/g ~~than~~ high than wood and is calorific value is 17KJ/g.

Ques 9 : What is use of slurry left behind after the formation of biogas?

Ans : Cow dung contains vital nutrients like nitrogen and phosphorus, which are necessary for growth and development of crops in soil. the left slurry used in it are use as manure.

✡ WORKSHEET

Ques 1 : The residue left after extracting juice from sugarcane is called.

Ans : Bagasse.

Ques 2 : The fuel used in chullah is.

Ans wood.

Ques 3 : Technological input has enabled us to convert wood into.

Ans : Charcoal

Ques 4 : What are disadvantages of burning wood directly as fuel?

Ans : # disadvantages of burning wood directly as fuel.

1. The calorific value of wood is low, only 17KJ/g. Thus, to produce sufficient amount of heat, we need to burn a large quantity of wood.
2. Using wood as fuel leads to cutting down of trees in forests. (deforestation)
3. The burning of wood produces a lot of smoke and harmful gases which pollutes air (air pollution)
4. wood occupies a large area and its transportation is difficult So, it's not a compact and convient fuel to use.
5. wood does not burn completely, it produces a lot of residue.

Ques 5: Why is charcoal a better fuel than wood?

Ans: Charcoal is better fuel than wood because charcoal calorific value is high is 33KJ/g and wood calorific value is low 17KJ/g. and charcoal burns completely. and wood does not burn compeletly. charcoal is compact fuel which is easy to handle and conveint to use as wood. occulpies large area., so it is not easy to handle.

Ques 6: why is biogas considered an ideal fuel for domestic use?

Ans: biogas is considered to be ideal fuel for domestic because its calorific value is very high and it does not produce any smoke or gas. It is used for illumation and drive generators and no storage problem and when it burn it be use for growth & development of crops in soil & it nutrients like nitrogen and phosphorus do not get loss.

Ques 7: Compare and contrast biomass and hydroelectricity as source of energy.

Ans :- Contrast between biogas (mass) and hydroelectricity

Parameter	BIOMASS	HYDROELECTRICITY
1. Source of energy	Renewable source of energy only if we plant trees in planned manner.	Renewable source of energy.
2. Energy production	The energy from biomass can be obtained by using chullah or biogas plant	Production of hydroelectricity requires constructions of dams on river
3. Installation	The devices required for using biomass (chullahas, biogass) can be installed at all places and even in remote village.	The power plant required for obtaining hydroelectricity can be installed only at few places where dam can be built on high altitude river.
4. Investment	It requires very little investment to install devices needed for producing energy from biomass.	It requires a huge investment in constructing dams to produce hydroelectricity.
5. Air Pollution	The use of biomass as fuels produces lot of smoke on burning, hence causing air pollution. Biomass provides pollution free energy only when wood is converted into charcoal and cow-dung converted into biogas using technological innovation.	Hydroelectricity is totally pollution free. It does not cause any air pollution.
6. Usage	It has a limited usage. It can be used for cooking food, illumination purposes, driving engins of water pumps. It cannot be used for generating	It has unlimited uses as it produces electricity to run all types of electrical appliances.

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Ques 1. Tidal energy is harnessed by constructing a .

Ans: Dam

Ques 2: Ocean thermal energy conversion plants can work only when the minimum temperature difference between water at the surface and water at depths upto 2km is.

Ans: 20°C

Ques 3: The energy possessed by huge waves needed to generate electricity is

Ans:

Ques 4. What are advantage of tidal energy as source of energy?

Ans: Advantages of Tidal energy.

1. It is an inexhaustible and renewable source of energy.
2. It does not cause any environmental pollution.
3. It is not affected by the uncertainty in rainfall.
4. It does not produce any harmful waste.
5. It saves our valuable fossil fuels as it does not require any fuel for its production.
6. Once the tidal energy plant is established, it has low maintenance cost.

Ques 5. List any four limitations of energy obtained from oceans.

Ans: Limitations of energy obtained from sea.

1. Limited sites: There are very few sites in world which are suitable for harnessing energy from oceans. Tidal dams to drive energy cannot establish everywhere as rise & fall of seat water during high and low tide, and where waves are strong. and when depth 2km temp diff b/w 20°C or more
2. Huge investment: The devices and technologies needed to trap ocean energy are very expensive.
3. Small scale power generation: The efficiency are very low. It is of variable nature
4. High maintenance cost: The sluice gate and blades of turbine are exposed to salty-water so they need high level maintenance. Hence, cost incurred in its maintenance is high

Quus 6. what are Limitations of Geothermal energy?

Ans:- Limitations of Geothermal energy.

1. Geothermal hot spots are scattered and not found everywhere There are few commerically viable sites where such energy can be harnessed.
2. Deep drilling in the earth take out steam coming from hot spots is very expensive. There are large no. of power plants based on it in New Zealand and United State of America.

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Quus 1. what is tidal energy? How is tidal energy harnessed for producing electricity?

Ans. Tidal energy :- The energy obtained from tidal waves is known as tidal energy.

Energy harnessed for producing electricity.

A tidal power plant has a dam built across a bay having narrow opening to sea. A turbine connected to generator through a shaft fixed at opening of dam. The dam has sulice gates. The opening and closing of sulices gate controlled by control valve. During high tides, when sulice gates are open. water fallon turbine. the kinetic energy of incoming flowing water rotates the (blades) turbine. when turbine rotates, its shaft rotates and make armature move rotate rapidly. Thus, electricity is produced. As tids fall. the sluice gate closed the water is trapped behind dam. It has potential energy it has low tide when water begins to recede away from land, the sluice gate opened. The stored water rotate it again. This drive generators to genrate electricity.

Quus 2 :- Why is there a temperature difference between water at upper surface and at deeper level of ocean?

Ans:- The water at surface of ocean or sea gets heated by heat of Sun. and attains a higher temperature. The water in deeper sections in Ocean is not heated to same extent and so is relatively colder. So, there is also temperature difference b/w water at upper surface and deeper level of Ocean.

Ques 3 what is wave energy? How is it used to generate electricity?

Ans Wave energy :- The energy associated with sea waves is called wave energy.

A wide variety of devices have been developed to trap wave energy to rotate the blades of turbine. The shaft of rotating turbine rotates the armature of the generator and electricity is produced.

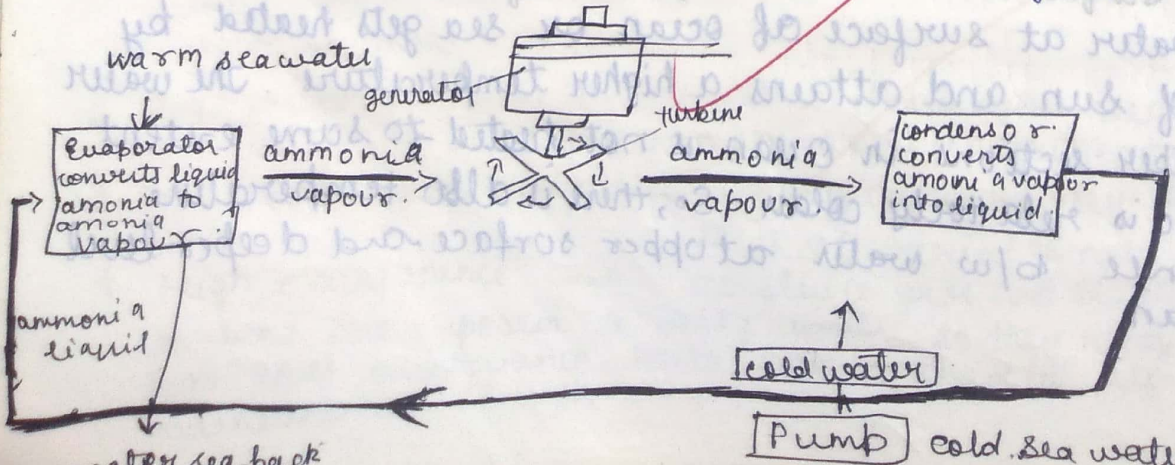
Some basic types of ~~trap~~ devices to trap wave energy for electricity.

1. Oscillating water column.
2. Wave capture device.
3. Wave profile devices.

Ques 4. Explain the working of an ocean thermal energy conversion power plant.

Ans # working of Ocean thermal energy conversion power plant.

1. It is operational when the temperature difference between water at the surface and water at depths up to 2km is 20°C or more. The warm water of sea is used to boil a liquid like ammonia or chlorofluorocarbon (CFC) in evaporator of OTEC plant to obtain its vapour.
2. The resulting vapours of ammonia liquid are used to rotate the blades of turbine. The rotating turbine rotates armature of generator to generate electricity. The cold water from depth of ocean is pumped up to condenser of the OTEC power plant. This cold water is used to condense ammonia vapour into liquid ammonia. The liquid ammonia is again taken back to the evaporator and the process is repeated again and again.



Ques5 How is electricity produced by geothermal energy?

Ans # the electricity is produced in two types by Geothrmal energy.

1- From natural Geysers :- At some places, steam and hot water trapped inside layers of rocks force their way to surface through cracks in rocks. They gush out in form of huge fountains called Geysers. These natural geysers are used to turn the turbine and generate electricity.

2. By drilling pipes :- At some places, steam trapped inside layers of rock is brought to the earth's surface by sinking pipes through holes drilled up to the hot spots. The steam which comes out at high pressure through holes is utilized to turn turbines of an electric generator to produce electricity.

Ques6 what are the advantages of geothermal technology over convential power generation?

Ans # Advantages of geothermal energy.

1. Geothermal is renewable source of energy. Since the interior of earth is going to remain hot for millions of years, geothermal energy is an inexhaustible source of energy.
2. It is a clean source of energy as it does not cause any environmental pollution.
3. The cost of production of electricity is not much i.e. the electricity produced is inexpensive and economical.
4. It enables us to save our fossil fuels as it requires no fules for its production.

Sol 7. Difference between Nuclear fission and Nuclear fusion

Parameter	Nuclear fission	Nuclear fusion
1. Process.	A heavy unstable nucleus breaks down into two or more lighter nuclei	Two (or more) lighter nuclei combine to form a heavier nucleus.
2. Nuclear fuel.	^{235}U, ^{239}Pu, etc.	Deuterium, tritium etc.
3. Availability of nuclear fuel.	Limited expensive.	Unlimited, cheap.
4. Nuclear radiation	It is accompained by emisson of nuclear radiation and hence causes nuclear pollution.	It dos not accompained by emission of nuclear radiadtion and hence cause no nuclear pollution.
5. chain reaction	It is ~~not~~ possible in fission reactions.	It is not possible.
6. Energy released	Amount of energy released is very large	Amount of energy released is much larger than that released in fission.
7. Problem of wastedisposal	very acute of waste produced in radioactive and causes pollution.	Not acute since produced in fusion reaction is not radioactive.

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