

1. What is heat? Write its S.I unit.

Solution:

Heat is the internal energy of molecules constituting the body. It flows from a hot body to a cold body. The S.I. unit of heat is joule (J).

2. Two bodies at different temperatures are placed in contact. State the direction in which heat will flow.

Solution:

Heat flows from the body having higher temperature to a body with low temperature.

3. Name the S.I. unit of heat. How is it related to the unit calorie?

Solution:

The S.I. unit of heat is joule (J).

Joule is related to unit calorie in the following way:

$1\text{J} = 0.24\text{cal}$ (approximately)

4. Define temperature and write its S.I unit.

Solution:

Temperature is a quantity which conveys the thermal state of a body (i.e., the degree of hotness or coolness of the body). It determines the direction of flow of heat when two bodies at different temperatures are placed in contact.

The S.I. unit of temperature is Kelvin (K)

5. Why does a piece of ice when touched with hand, appear cool? Explain.

Solution:

It appears cool because when ice is touched, heat passes from our hand to the ice.

6. Distinguish between heat and temperature.

Solution:

The differences are as follows:

Heat	Temperature
Form of energy obtained as a result of random motion of molecules in a substance	Quantity that indicates the thermal state of a body, determines direction of heat flow when two bodies are kept in contact having different temperatures
S.I. unit - Joule (J)	S.I. unit - Kelvin (K)
Measured using - Principle of calorimetry	Measured using - Thermometer
Amount of heat contained in a body depends on mass, temperature, material of the body	Temperature depends on the average kinetic energy of its molecules as a result of their random motion

7. What do you understand by thermal expansion of a substance?

Solution:

Thermal expansion of a substance is its expansion when it is heated.

8. Name two substances which expand on heating.

Solution:

The two substances that expand on heating are:

- Brass
- Iron

9. Name two substances which contract on heating.

Solution:

The two substances that contract on heating are:

- Silver iodide from 80°C to 141°C
- Water from 0°C to 4°C

10. What do you mean by anomalous expansion of water?

Solution:

It is the expansion of water when it is cooled from 4°C to 0°C .

11. At what temperature the density of water is maximum? State its value.

Solution:

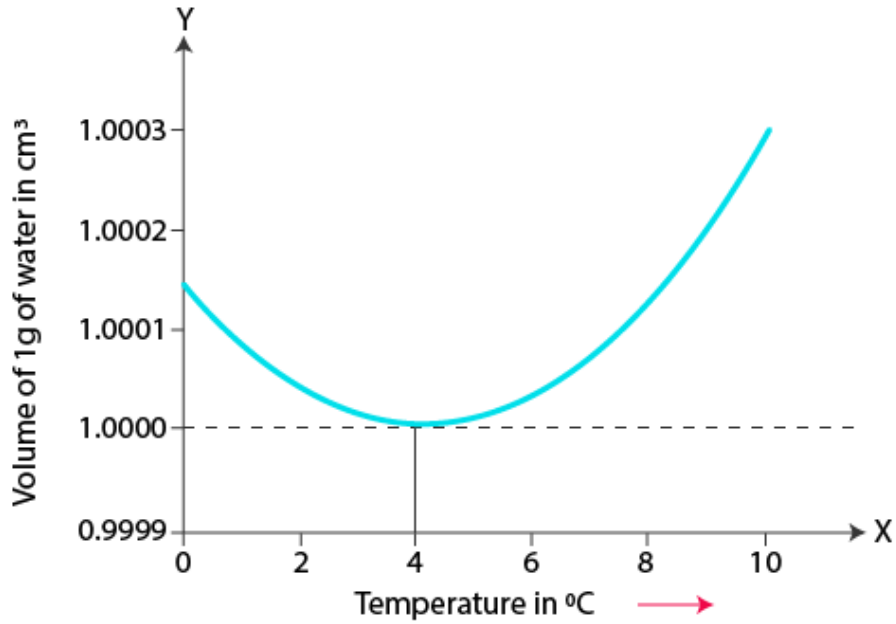
The density of water is maximum at 4°C , its value is 1000 kg m^{-3} .

12. State the volume changes observed when a given mass of water is heated from 0°C to 10°C . Sketch a temperature-volume graph to show the behavior.

Solution:

The volume change, it decreases when a given mass of water is heated from 0°C to 4°C , i.e., it contracts. The volume increases when it is heated from 4°C to 10°C . i.e., it expands.

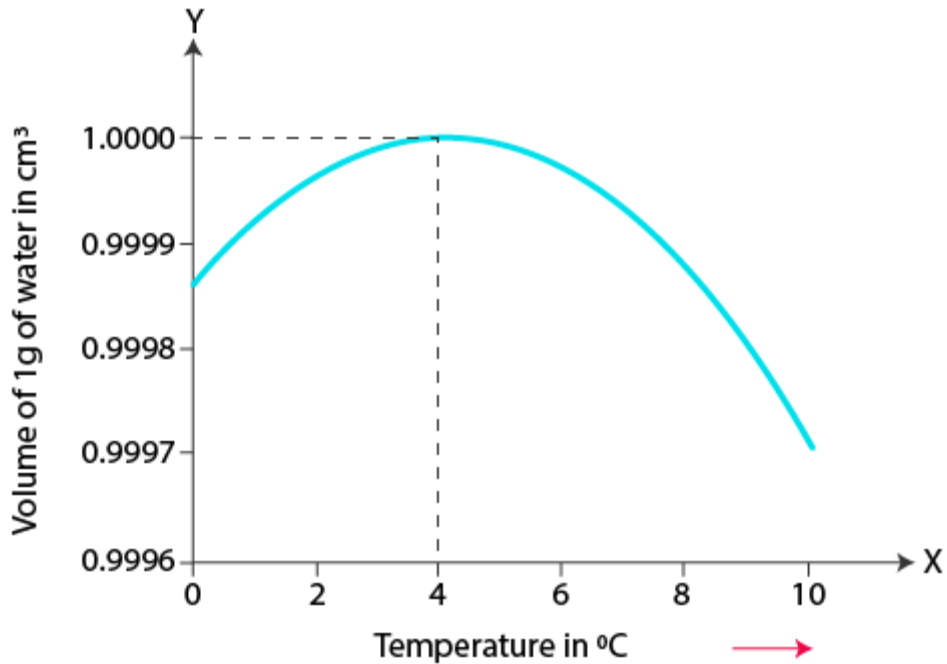
The following temperature-volume graph shows the behavior:



13. Draw a graph to show the variation in density of water with temperature in the temperature range from 0°C to 10°C.

Solution:

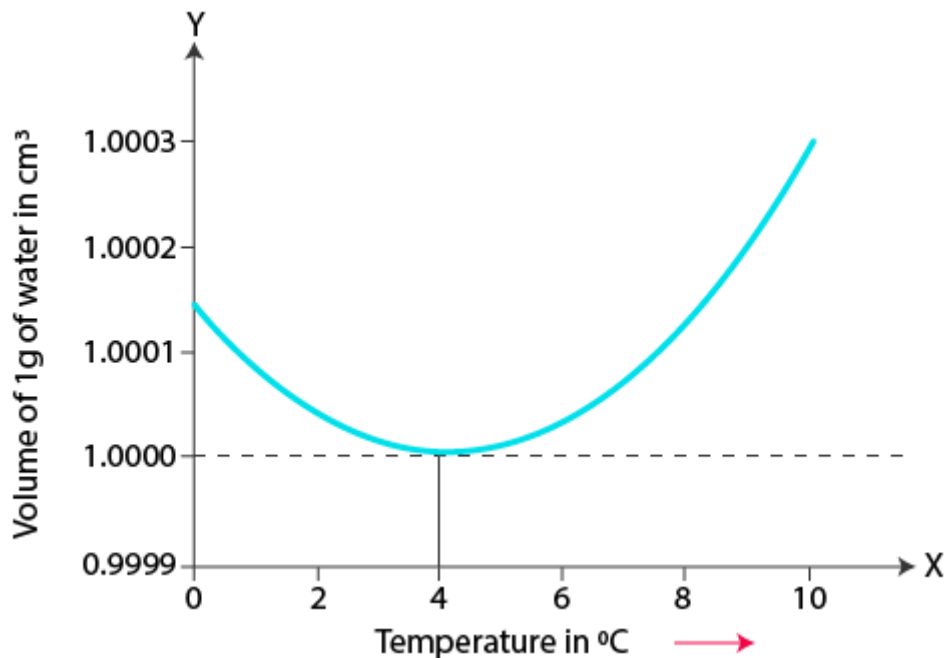
The following graph shows the variation in density of water with temperature in the range of 0°C to 10°C.



14. A given mass of water is cooled from 10°C to 0°C . State the volume changes observed. Represent these changes on a temperature-volume graph.

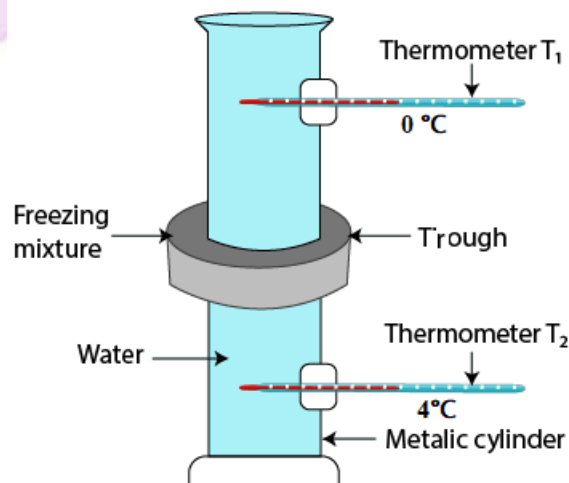
Solution:

When water is cooled from 10°C , the density of water first increases up to 4°C and then decreases on cooling further below 4°C to 0°C . Hence, the density of water is maximum at 4°C which is equal to 1 g cm^{-3}



15. Describe an experiment to show that water has maximum density at 4°C . What important consequences follow from this peculiar property of water? Discuss the importance of this phenomenon in nature.

Solution:



T.C. Hope devised a simple arrangement known as Hope's apparatus for demonstrating the anomalous expansion of water.

Experimental Setup: The apparatus consists of a tall metallic cylinder with two side openings P (near the top) and Q (near the bottom), fixed with thermometers T_1 and T_2 . The center part of the cylinder is girdled with a cylindrical trough which contains the mixture of ice and salt. The cylinder is filled with pure water that is at room temperature.

Observation:

- Both thermometers T_1 (upper thermometer) and T_2 (lower thermometer), initially are at the same room temperature
- Initially, the temperature noted at T_2 starts decreasing, becomes steady at 4°C , while temperature at T_1 remains unchanged at this time.
- Temperature recorded at T_2 is steady and constant at 4°C and at T_1 records a continuous fall in the temperature up till 0°C which then becomes steady.
- Lastly, the temperature at T_1 is 0°C and the temperature at T_2 is 4°C .

The density of water increases and it contracts when the freezing mixture cools water in the central portion of the cylinder, causing it to sink to the base, for the reading of T_2 to rapidly fall. No changes are observed at T_1 because the temperature of water in the upper part remains unchanged which continues until the intact water located below the central portion touches 4°C . Due to anomalous expansion, on cooling further below 4°C , water of the central portion expands causing the density to decrease, consequently it rises upwards. This results in the readings of T_1 to fall rapidly at 0°C , thereby causing water to freeze to form ice at 0°C at the top, proving water has the maximum density at 4°C .

Importance:

Helps to preserve the aquatic life during cold weathers, as temperature falls in winter, the uppermost layer of ponds contract, causing it to become denser, hence sinking. Thereby, a circulation is setup, till the whole of water in the pond reaches its maximum density at 4°C . A further drop in the temperature causes the top layer to expand and remain intact at the top until it freezes. This is why, though the layers at the top freeze, the water at the base is at 4°C , where fishes can thrive easily.

16. Deep pond of water has its top layer frozen during winter. State the expected temperature of water layer (i) just in contact with ice, (ii) at the bottom of pond.

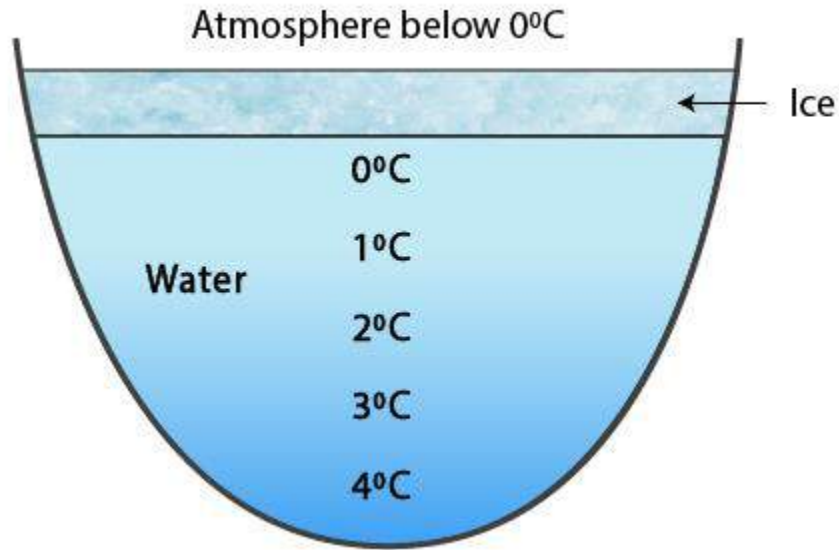
Solution:

- (i) Just in contact with ice - 0°C
- (ii) At the bottom of pond - 4°C

17. Draw a labelled diagram showing the temperature of various layers of water in an ice covered pond.

Solution:

The following diagram shows the temperature of various water layers in an ice covered pond.



18. Explain the following:

- (a) Water pipes in colder countries often burst in winter.
- (b) In winter, water tank (or ocean) starts freezing from the surface and not from the bottom
- (c) Fishes survive in ponds even when the atmospheric temperature is below 0°C
- (d) A hollow glass sphere which floats with its entire volume submerged in water at 4°C, sinks when water is heated above 4°C.
- (e) A glass bottle completely filled with water and tightly closed at room temperature, is likely to burst when kept in the freezer of a refrigerator.

Solution:

- (a) The atmospheric pressure on winter nights drops below 4°C causing the water enclosed in the pipe lines to expand and exert a huge pressure on the pipe, hence the bursting
- (b) The temperature drops in winters causing the surface of the tank to contract and become dense and sink to the base. A circulation is hence set up till the intact water in the tank touches the maximum density at 4°C. Further fall in temperature causes the upper most layer to expand and remains there until it is frozen. Consequently, water in the tank freezes from the top and not from the base.
- (c) During colder weathers, the aquatic life is preserved by the anomalous expansion of water. The topmost layer in the pond contracts when the temperature drops, hence becomes denser and sinks to the bottom. Until the water touches maximum density at 4°C, the circulation is set up. Drop in temperature causes the top layer to expand and remain at the top until it freezes. Hence, though the upper layer is frozen, the water at the base is at 4°C, hence the fishes can easily survive.
- (d) The density of water decreases on heating water above 4°C. Consequently, the upthrust or the upward force that acts on the water as a result of the water upon the hollow glass sphere decreases, causing it to sink.
- (e) When the temperature of the water falls below 4°C inside the freezer, the water inside the bottle starts expanding. In case the bottle is filled completely and secured tightly, water cannot expand, hence it may burst.

Multiple choice type:

1. Calorie is the unit of:

- (a) Heat
- (b) Work
- (c) Temperature
- (d) Food

Solution:

- (a) Heat

Heat is measured in calorie. $1 \text{ cal} = 4.186 \text{ J}$

2. 1 J equals to:

- (a) 0.24 cal
- (b) 4.28 cal
- (c) 1 cal
- (d) 1 kcal

Solution:

- (a) 0.24 cal

3. S.I. unit of temperature is:

- (a) cal
- (b) joule
- (c) celsius
- (d) kelvin

Solution:

- (d) kelvin

Though temperature is usually measured in Celsius, kelvin is the S.I. unit.

4. Water is cooled from 4°C to 0°C . It:

- (a) Contracts
- (b) Expands
- (c) First contracts, then expands
- (d) First expands, then contracts

Solution:

- (b) Expands

Expansion of water occurs when water is cooled from 4°C to 0°C .

5. Density of water is maximum at:

- (a) 0°C
- (b) 100°C
- (c) 4°C
- (d) 15°C

Solution:

- (c) 4°C

Exercise-6(B)

1. What is an ecosystem? Name its two components.

Solution:

It is a unit composed of biotic components (consumers, producers) and abiotic components (heat, rain, humidity).

The two components of ecosystem are:

- Biotic component
- Abiotic component

2. What is the source of energy for all ecosystems?

Solution:

The most significant source of energy for all ecosystems is the Sun.

3. State the importance of green plants in an ecosystem.

Solution:

Plants absorb most of the energy that is incident on them, and out of all the energy absorbed, only 0.02% is utilized in photosynthesis to produce food, hence they are called as producers. Green plants are involved in producing food for the consumers, serving as the primary producers of the ecosystem. Not only for synthesis of food, green plants are crucial in maintaining the balance of carbon dioxide and oxygen on the planet.

4. Differentiate between the producers and consumers.

Solution:

The differences are as follows:

Producers	Consumers
They produce their own food using energy from the Sun	They do not produce their own food, depend on producers for their nutritional requirements
Example: Green plants	Example: Herbivores

5. State the functions of decomposers in an ecosystem.

Solution:

The functions of decomposers in an ecosystem are:

- Disintegrates dead organisms and obtain their nutritional requirements from them.
- Dead organisms create nutrients which revert to the soil, to be reused by plants-the producers.
- Once returned to the soil, they are used up as a source of food by fungi and bacteria by converting from complex organic matter to simpler nutrients.
- These nutrients in the simplest form can then be used by the producers to resume the cycle.
- Hence decomposers play a critical role in the ecosystem.

6. What is a food chain?

Solution:

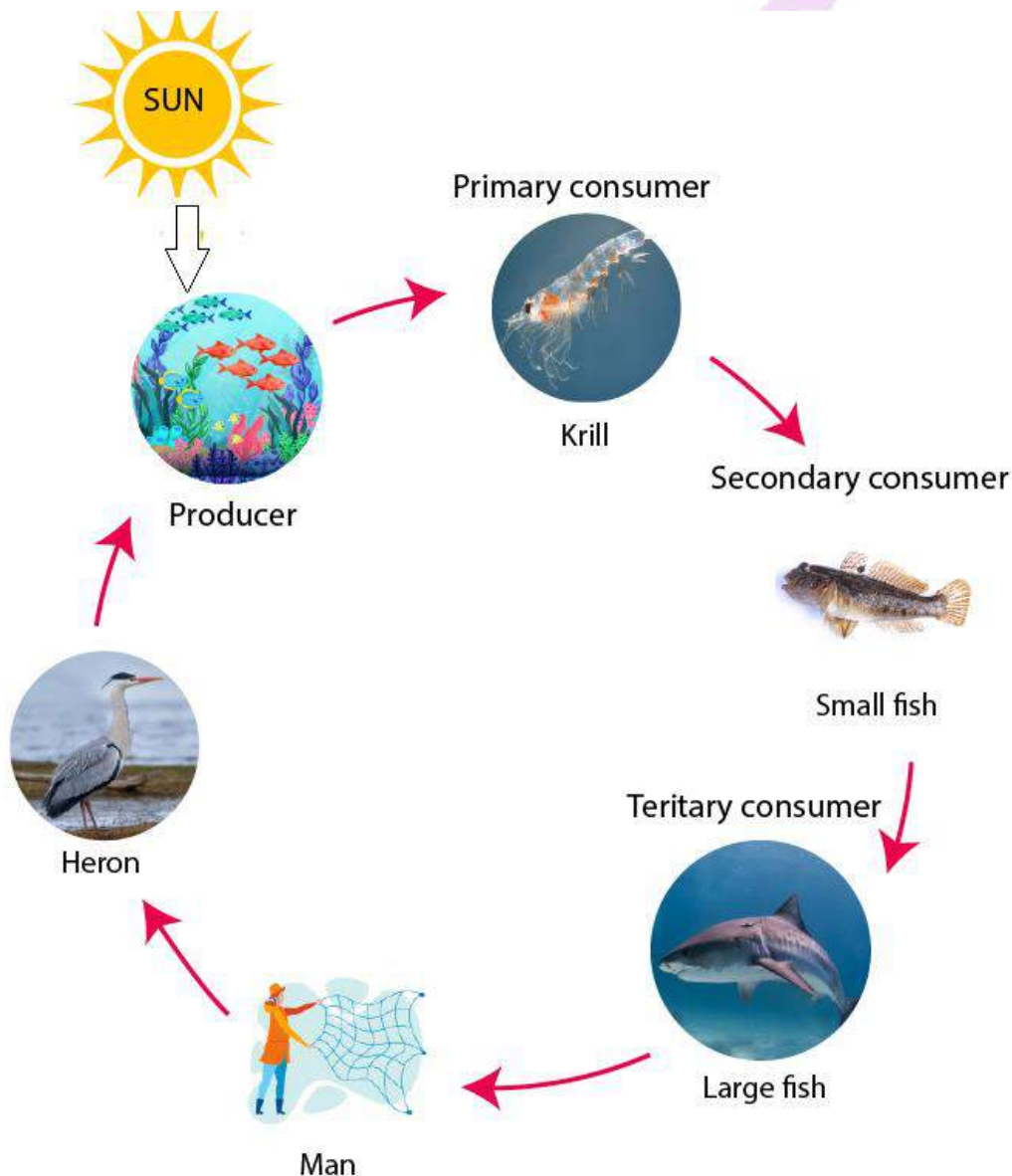
A food chain demonstrates the feeding or nourishing relationship that is shared between varied living entities in a specific habitat or environment. The food chain begins with producers, that synthesize their own food with using energy from the Sun. Next in the chain, are the primary consumers (herbivores) that depend on producers for their nutritional requirements.

Food chain is a series of events, depicting the energy flow from the Sun to the producers, from the consumers to the decomposers.

7. Draw a simple diagram showing a food chain.

Solution:

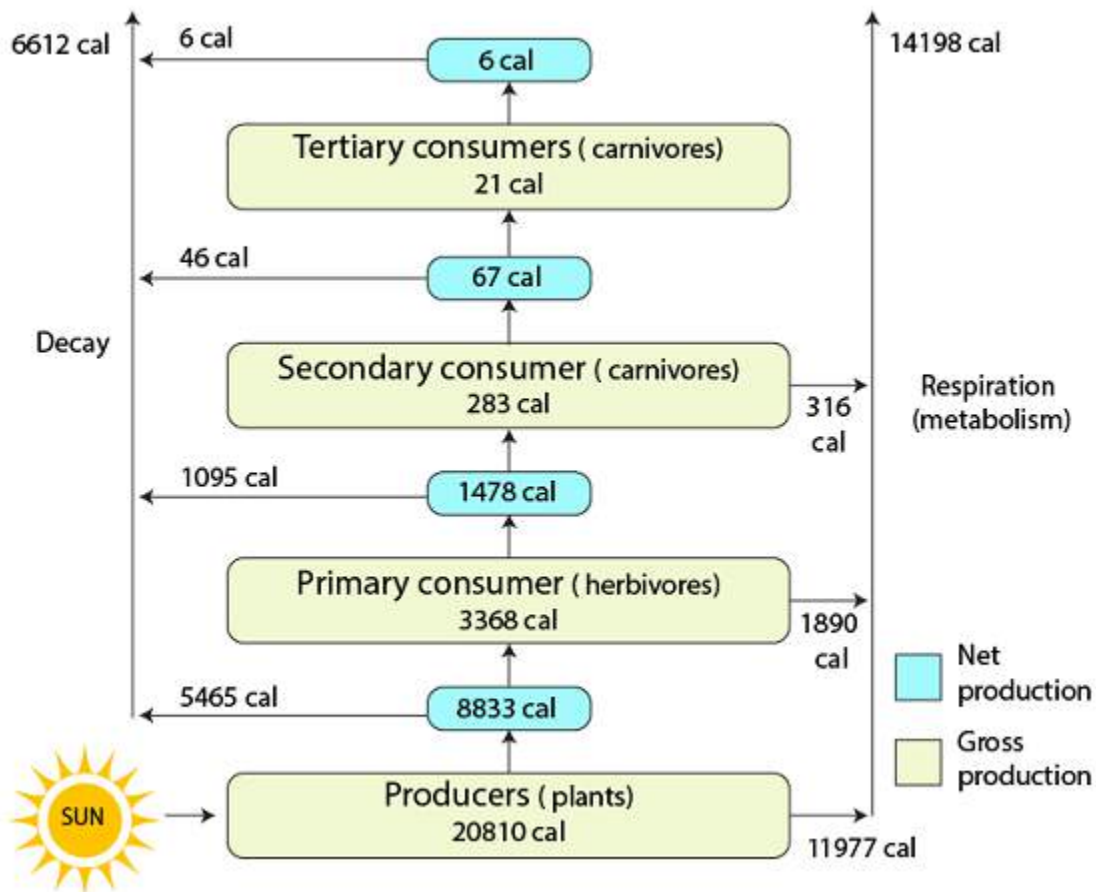
The diagram below depicts a simple food chain.



8. Describe the energy flow in an ecosystem.

Solution:

The rotation of energy and the nutrients that are obtained from external sources brings about a maintenance in the ecosystem. Plants, a few bacteria, algae are some of the primary producers at the trophic level utilizing energy from the Sun to synthesize organic plant material with the help of a process called as photosynthesis. The second trophic level is formed by the herbivores or the primary consumers that entirely depend upon producers for their nutritional requirements. The third trophic level comprises of predators that consumer the herbivores. In case larger predators are found, they would comprise higher trophic levels. Fungi, bacteria etc. are the decomposers that disintegrate wastes and dead organic matters which eventually revert to the soil.



9. State the law which governs the energy flow in an ecosystem.

Solution:

The energy flow in an ecosystem is governed by the laws of Thermodynamics.

First Law of Thermodynamics – The energy can be transmitted from one form to another, but it can neither be created nor be destroyed.

Second Law of Thermodynamics – When energy is used, always, a part of it is converted to an unused heat form because of radiation and friction.

10. Show that the energy flow in an ecosystem is linear.

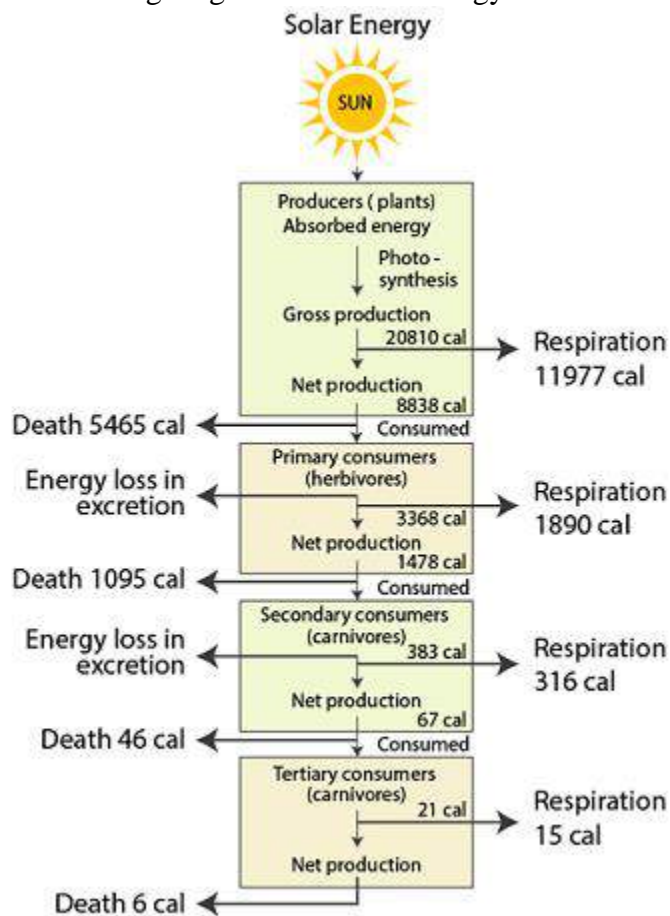
Solution:

Plants are the primary producers, they absorb solar energy to synthesize food. This food is then used up by the primary consumers, they in turn are consumed by the secondary consumers, and the secondary by the tertiary consumers. This flow of energy from the producers till the tertiary consumers is unidirectional or linear. The dead and decaying matter resulting from the food chain are consumed by the decomposers which in turn revert the nutrients to the soil, ready to be consumed by the plants, causing the energy to reach the degraded state. The process cannot be returned to the Sun to be cyclic, hence the energy flow in the ecosystem is linear.

11. Draw a simple diagram showing the energy flow in a food chain.

Solution:

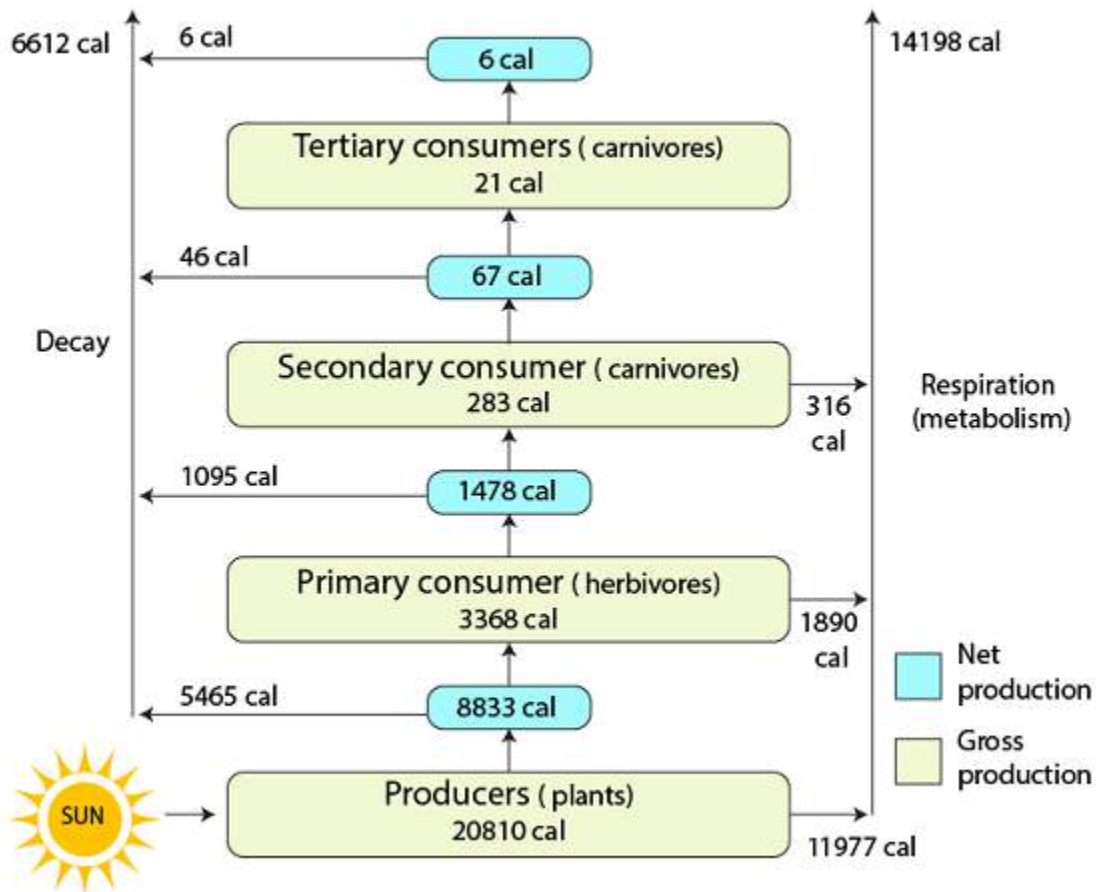
The following diagram shows the energy flow in a food chain:



12. Draw a diagram to show that the energy flow in an ecosystem is governed by the law of conservation of energy.

Solution:

The diagram shows the energy flow in an ecosystem is governed by the law of conservation of energy.



Multiple choice type:

1. Food chain begins with:

- (a) Respiration
- (b) Photosynthesis
- (c) Decomposition
- (d) Decay

Solution:

- (b) Photosynthesis

The first trophic level is formed by the primary producers, the green plants which produce food through the process of photosynthesis.

2. The source of energy in an ecosystem is:

- (a) Sun
- (b) Decayed bodies
- (c) Green plants
- (d) Sugar

Solution:

- (a) Sun

The Sun is the ultimate source of energy for all ecosystems.

3. Energy enters in a food chain through:

- (a) Primary consumers
- (b) Secondary consumers
- (c) Tertiary consumers
- (d) Producers

Solution:

- (d) Producers

Green plants, some bacteria form the first trophic level in the food chain. They are the primary producers.

4. The place of human beings in food chain in an ecosystem is as a:

- (a) Producer
- (b) Consumer
- (c) Decomposer
- (d) Both (a) & (b)

Solution:

- (b) Consumer

Human beings depend upon the primary producers, the plants, for their nutritional requirements.

Exercise-6(C)

- 1. State two characteristics which a source of energy must have.**

Solution:

The two characteristics that a source of energy must have are as follows:

- It should be such that it can provide a sufficient amount of useful energy at a steady rate over a long period of time
- It should be safe and convenient to use, economical and easy to store and transport.

- 2. Name the two groups in which various sources of energy are classified. State on what basis are they classified.**

Solution:

On the basis of view of availability, the various sources of energy are classified into the following two groups:

- Renewable or non-conventional sources of energy
- Non-renewable or conventional sources of energy

- 3. What is meant by renewable and non-renewable sources of energy? State two differences between them, giving two examples of each.**

Solution:

Renewable sources of energy or non-conventional source – it is a natural source providing us energy continuously

Non-renewable source of energy or conventional source – it is a source of energy which has accumulated in nature over a very long period of time and cannot be replaced quickly when exhausted.

Differences are as follows:

Renewable source	Non-renewable source
They can be continuously utilized	Once exhausted, they cannot be utilized
They are replenished naturally over relatively shorter periods of time	Takes a long time for them to be replenished
They are non-conventional sources	They are conventional sources
Example – Sun, Flowing water	Example – Coal, petroleum

- 4. Select the renewable and non-renewable sources of energy from the following:**

- (a) Coal
- (b) Wood
- (c) Water
- (d) Diesel
- (e) Wind
- (f) Oil

Solution:

Renewable sources of energy	Non- Renewable sources of energy
Water	Coal
Wind	Diesel

Wood	Oil
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5. Why is the use of wood as a fuel is not advisable although wood is a renewable source of energy?

Solution:

Wood as a fuel is not advisable though wood is a renewable energy source as wood is obtained from trees. Trees are required to be chopped so as to use it as a fuel. On the other hand, burning of wood liberates smoke causing pollution.

6. Name five renewable and three non-renewable sources of energy.

Solution:

The five renewable sources of energy are:

- Sun
- Wind
- Flowing water
- Tides
- Nuclear fuel

The three non-renewable sources of energy are:

- Coal
- Petroleum
- Natural gas

7. What is (i) tidal, (ii) ocean and (iii) geo thermal energy? Explain in brief.

Solution:

- (i) Tidal – it is the energy possessed by the rising and the falling of water in tides. Construction of dams across a narrow opening to the sea, is a way to harness tidal energy for electricity generation on a smaller scale.
- (ii) Ocean – the ocean water possesses energy in two forms – ocean thermal energy & oceanic wave energy.
Ocean thermal energy – it is the energy that is available as a result of the differences in temperature of water at the surface and at deeper levels of the ocean. Ocean thermal energy is harnessed to produce electricity with the help of a device known as ocean thermal energy conversion plant (OCTEC power plant)
Oceanic wave energy – The kinetic energy possessed by fast moving oceanic waves is known as wave energy.
- (iii) Geo thermal energy – it is the heat energy possessed by rocks inside the earth and is harnessed to produce electricity. Deep inside the earth, hot rocks are present at the hot spots, which are responsible to heat up the underground water causing it to turn to steam, which is compressed between rocks at higher pressure. Drilling of holes deep until the hot spots for extraction of steam through the pipes causes the turbines to rotate that are connected to the armature of an electric generator in order to produce electricity.

8. What is the main source of energy for the earth?

Solution:

The main source of energy for the earth is the Sun.

9. What is solar energy? How is solar energy used to generate electricity in a solar power plant?

Solution:

Solar energy is the energy obtained from the Sun.

The devices where heat energy of the sun is used to generate electricity is called as a solar power plant, it consists of a great number of concave reflectors, which comprises of black painted water pipes. The reflectors focus the heat energy obtained from the sun on the pipes because of which the water in the pipes begin to boil generating steam. This steam is used to rotate a steam turbine that drives a generator producing electricity.

10. What is a solar cell? State two uses of solar cells. State whether a solar cell produces a.c. or d.c. Give one disadvantage of using a solar cell.

Solution:

Solar cell – It is an electrical device that converts solar energy directly into electricity aided by photovoltaic effect. They are made from semiconductors such as gallium and silicon with some impurity supplemented to it. When sun rays fall on solar cells, a potential difference is created between its surface because of which the current flows in the circuit that is connected between the opposed sides of the semiconductors.

Two uses of solar cells are:

- It requires no maintenance and can last over a longer duration at zero running cost.
- Useful for inaccessible, remote and secluded places where electric power lines cannot be placed.

Solar cells produce direct current (d.c.)

Disadvantage: The initial cost of solar panels is fairly high.

11. State two advantages and two limitations of producing electricity from solar energy.

Solution:

Two advantages of producing electricity from solar energy –

- Running cost of solar panels are almost nil
- Do not cause any pollution in the environment and are hence the cleanest sources of electricity

Two limitations of producing electricity from solar energy –

- Initial cost of solar panel is sufficiently high
- Low efficiency from conversion of solar energy to electricity

12. What is wind energy? How is wind energy used to produce electricity? How much electric power is generated in India using wind energy?

Solution:

Wind energy is the kinetic energy of the large masses of air in motion.

Wind energy is used in the form of a wind generator to generate electricity by utilizing wind mill to drive the wind generator.

As in 2019, India's total installed power generation capacity is 62.03 TWh, which is nearly 4% of the total electricity generation.

13. State two advantages and two limitations of using wind energy for generating electricity.

Solution:

Two advantages of using wind energy for generating electricity:

- It is a renewable source of energy.
- Does not cause any kind of pollution

Two limitations of using wind energy for generating electricity:

- To establish wind farms, a large area of land is required
- Establishment of wind farm is expensive

14. What is hydro energy? Explain the principle of generating electricity from hydro energy. How much hydro electric power is generated in India?

Solution:

Hydro energy is the kinetic energy possessed by flowing water.

Principle of generating electricity from hydro energy – water flowing from higher altitudes is accumulated at a dam placed at a height. This water is made to fall on a water turbine that is positioned near the base of the dam. The shaft of the turbine is in contact with the armature of a dynamo or an electric generator.

Approximately 14% of the total electricity is generated by the hydro electricity.

15. State two advantages and two disadvantages of producing hydro-electricity.

Solution:

The two advantages of producing hydro-electricity are:

- It is a renewable source of energy
- Does not cause any environmental pollution

Two disadvantages of producing hydro-electricity are:

- Animal and plant life gets destructed due to the construction of dams over the water bodies
- Due to this process the ecological balance in the downstream areas of water bodies such as rivers are disturbed

16. What is nuclear energy? Name the process used for producing electricity using the nuclear energy.

Solution:

Nuclear energy is the energy released when a heavy nucleus is bombarded with slow neutrons causing it to split into nearly two equal and light nuclei resulting in the liberation of enormous amount of energy. During nuclear fission, the net sum of masses of products is comparatively lesser than the total sum of masses of reactants. The mass that is liberated, gets converted into energy. The released energy is nuclear energy.

The process used for producing electricity using the nuclear energy is known as nuclear power plant. It is a set up by the controlled chain reaction of nuclear fission of a radioactive substance like uranium-235 (or plutonium-239).

17. What percentage of total electrical power generated in India is obtained from nuclear power plants? Name two places in India where electricity is generated from nuclear power

plants?

Solution:

Currently, only about 3% of the total electrical power generated in India is obtained from nuclear power plants.

The two places in India from where electricity is generated from nuclear power plants are:

- Tarapur in Maharashtra
- Kaiga in Karnataka

18. State two advantages and two disadvantages of using nuclear energy for producing electricity.

Solution:

Two advantages of using nuclear energy to produce electricity are as follows:

- Enormous amount of energy can be produced with a very small amount of nuclear fuel such as uranium-235
- Energy is released for a long period of time once the nuclear fuel is loaded into the nuclear power plant.

Two limitations of using nuclear energy to produce electricity are as follows:

- Release of harmful radiations in the process which is highly energetic and penetrating. The radiations cause ionization which can be harmful to the body of the workers deployed in nuclear power plants. Hence a high standard protection is required for them
- High level of environmental pollution is caused by the wastes obtained from the nuclear power plants.

19. State the energy transformation in the following:

- Electricity is obtained from solar energy**
- Electricity is obtained from wind energy**
- Electricity is obtained from hydro electricity**
- Electricity is obtained from nuclear electricity**

Solution:

- Light energy transformed into electrical energy
- Mechanical energy transformed into electrical energy
- Mechanical energy transformed into electrical energy
- Nuclear energy transformed into electrical energy

20. State four ways for the judicious use of energy.

Solution:

The four ways with which energy can be used judiciously are:

- Fossil fuels should be used only for limited purposes when no other alternative source of energy is available
- Energy wastage should be avoided
- The practice of chopping down trees must be banned. More trees must be planted
- Efforts should be made to utilize energy in groups/community

21. What do you mean by degradation of energy? Explain it by taking two examples of your daily life.

Solution:

Degradation of energy is the eventual decline in the energy that is useful as a result of friction etc.

Two examples are as follows:

- A large part of electrical energy is wasted in the form of heat energy when electrical appliances are run on electricity.
- A large part of heat energy from the fuel is given out when food is cooked over fire. The liberated energy is of no use, instead causes pollution.

22. The conversion of part of energy into an unuseful form of energy is called _____

Solution:

Degradation of energy

Multiple choice type:

1. The ultimate source of energy is:

- (a) Wood
- (b) Wind
- (c) Water
- (d) Sun

Solution:

- (d) Sun

The Sun is the ultimate source of energy for all ecosystems.

2. Renewable source of energy is:

- (a) Coal
- (b) Fossil fuels
- (c) Natural gas
- (d) Sun

Solution:

- (d) Sun

Coal, fossil fuels, natural gas are all non-renewable sources of energy.

1. What do you mean by green house effect?**Solution:**

Green house effect is the process where the earth's surface and its lower atmosphere warms up due to absorption of infrared radiations of long wavelengths that are emitted from the planet's surface by the green house gases such as carbon dioxide, water vapor, methane nitrous oxide, ozone, chlorofluoro carbons (CFCs) etc.

2. Name three green house gases.**Solution:**

Three green house gases are – Carbon dioxide, Methane nitrous oxide, ozone

3. Which of the following solar radiations pass through the atmosphere of the earth?**X-rays, ultraviolet rays, visible light rays, infrared radiation.****Solution:**

The solar radiations that pass through the atmosphere of the earth are Visible light rays and infrared radiation.

4. What results in the increase of carbon dioxide contents of earth's atmosphere?**Solution:**

The increase of the carbon dioxide content in the earth's atmosphere can be contributed to industrial growth, deforestation and burning of fossil fuels.

5. Name the radiations which are absorbed by the green house gases.**Solution:**

The radiations that are absorbed by the green house gases are infrared radiation of longer wavelengths.

6. What would have been the temperature of earth's atmosphere in absence of green house gases in it?**Solution:**

The average temperature of the earth would have been -18°C in the absence of green house gases.

7. State the effect of green house gases on the temperature of earth's atmosphere.**Solution:**

They have an effect on the temperature of approximately 15.5°C

8. What do you mean by global warming?**Solution:**

It is the increase in the average effective temperature near the earth's surface due to an increase in the amount of green house gases in its atmosphere.

9. What causes the rise in atmospheric temperature?**Solution:**

Rise of atmospheric pressure can be contributed to the an increase in the concentration of green house gases due to activities such as deforestation, combustion of fossil fuels, industrial growth.

10. State the cause of increase of green house effect.**Solution:**

Increase in the green house effect can be contributed to activities such as deforestation, industrialization, combustion of fuels, natural gas exploration, extensive use of gadgets such as refrigerators etc.

11. What will be the effect of global warming at the poles?**Solution:**

As the temperature decreases at the poles, the snow caps and ice melt their way, causing floods at coastal countries. The icebergs of oceans and dark land melt, causing them to uncover and absorb more heat radiations from the Sun, which furthermore increases the green house effect.

12. State the effect of global warming in coastal regions.**Solution:**

The ice and snow melts at the poles causing flood in coastal countries due to global warming.

13. How will global warming affect the sea level?**Solution:**

Global warming causes melting of glaciers and polar ice which results in the rise in sea level on coastal wet lands which causes a rise worldwide in the level of sea. Hence, several big cities in the coastal regions would be covered by sea water.

14. How will global warming affect agriculture?**Solution:**

Global warming would result in a low agricultural yield as it would tremendously cause changes in the patterns of rainfall, wind etc.

15. State two ways to minimize the impact of global warming.**Solution:**

The two ways to minimize the impact of global warming are as follows:

- Instead of generating electricity from non-renewable resources such as fossil fuels etc, renewable sources must be utilized
- Population must be controlled through various activities such as family planning, women empowerment schemes and programmes, welfare reforms etc.

16. What is carbon tax? Who will pay it?**Solution:**

Carbon tax is the tax calculated based on the carbon emission from number of employee hour and turnover of the factory, industry.

Carbon tax is paid by industries which promotes industries to use energy efficient techniques.

Multiple choice type:

1. The green house gas is:

- (a) Oxygen
- (b) Nitrogen
- (c) Chlorine
- (d) Carbon dioxide

Solution:

- (d) Carbon dioxide
Green house gases cause the green house effect.

2. The increase of carbon dioxide gas in atmosphere will cause:

- (a) Decrease in temperature
- (b) Increase in temperature
- (c) No change in temperature
- (d) Increase in humidity

Solution:

- (b) Increase in temperature
Increase in the green house gases has an effect on the temperature.

3. Without green house effect, the average temperature of earth's surface would have been:

- (a) -18°C
- (b) 33°C
- (c) 0°C
- (d) 15°C

Solution:

- (a) -18°C
Absence of green house gases would cause the average temperature of the earth's surface to drop.

4. The global warming has resulted in:

- (a) The increase in yield of crops
- (b) The decrease in sea levels
- (c) The decrease in human deaths
- (d) The increase in sea levels.

Solution:

- (d) The increase in sea levels
Increase in the sea levels is caused to due to melting of ice caps and snow at the poles due to an increase in the temperature.