CHAPTER 4- HEAT

Question 1. State similarities and differences between the laboratory thermometer and the clinical thermometer.

Answer- Similarities- (1) Both are made of glass and consist of long narrow glass tube.

(2) At one end both of them have a bulb.

(3) Bulbs of both the thermometers consist of mercury.

(4) Celsius scale is present in both the thermometer.

Differences-

Clinical Thermometer	Laboratory thermometer
1. Temperature range is 35ºC to 42ºC.	1. Temperature range is -10ºC to 110ºC.
2. Used to measure human body temperature.	2. Used to measure temperature in the laboratory.
3. It has a kink.	3. It does not have a kink.

Question 2. Give two examples each of conductors and insulators of heat.

Answer- Conductors:- Iron and Copper.

Insulators:- Plastic and wood.

Question 3. Fill in the blanks:

(a) The hotness of an object is determined by its **tempertarure.**

(b) Temperature of boiling water cannot be measured by a **clinical** thermometer.

(c) Temperature is measured in degree **Celsius.**

(d) No medium is required for transfer of heat by the process of **radiation.**

(e) A cold steel spoon is dipped in a cup of hot milk. It transfers heat to its other end by the process of **conduction.**

(f) Clothes of **dark** colours absorb more heat better than clothes of light colours.

Question 4. Match the following :

1. Land breeze blows during	(a) Summer.
2. Sea breeze blows during	(b) Winter.
3. Dark coloured clothes are preferred during	(c) Day.
4. Light coloured clothes are preferred during	(d) Night.

Question 5. Discuss why wearing more layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing?

Answer- More layers of clothing during winter keeps us warmer than wearing just one thick piece of clothing because air gets trapped in-between layer. As air is a bad conductor of heat it does not allow the escape of the heat from the body.

Question 6- Look at Mark where the heat is being transferred by conduction, by convection and by radiation.

Fig. 4.13

Answer

Question 7. In places of hot climate it is advised that the outer walls of houses be painted white. Explain.

Answer- Because white colour reflects back most of the heat that is incident on it as white is a poor absorber of heat. This helps in keeping the house cool.

Question 8. One litre of water at 30°C is mixed with one litre of water at 50°C. The temperature of the mixture will be

(a) 80°C

(b) more than 50°C but less than 80°C

(c) 20°C

(d) between 30°C and 50°C **(✓)**

Question 9. An iron ball at 40°C is dropped in a mug containing water at 40°C. The heat will

(a) flow from iron ball to water.

(b) not flow from iron ball to water or from water to iron ball. **(✓)**

(c) flow from water to iron ball.

(d) increase the temperature of both.

Question 10. A wooden spoon is dipped in a cup of ice cream. Its other end

(a) becomes cold by the process of conduction.

(b) becomes cold by the process of convection.

(c) becomes cold by the process of radiation.

(d) does not become cold. **(✓)**

Question 10. Stainless steel pans are usually provided with copper bottoms. The reason for this could be that

(a) copper bottom makes the pan more durable.

(b) such pans appear colourful.

(c) copper is a better conductor of heat than stainless steel. **(✓)**

(d) copper is easier to clean than the stainless steel.

CHAPTER 6- PHYSICAL AND CHEMICAL CHANGES

Question 1. Classify the changes involved in the following processes as physical or chemical changes

1. **Photosynthesis - Chemical Change**
2. **Dissolving sugar in water - Physical Change**
3. **Burning of coal - Chemical Change**
4. **Melting of wax - Physical Change**
5. **Beating aluminium to make aluminium foil - Physical Change**
6. **Digestion of food - Chemical Change**

Question 2. State whether the following statements are true or false. In case a statement is false, write the corrected statement in your notebook.

1. **Cutting a log of wood into pieces is a chemical change. (False)**
   { Cutting a log of wood into pieces is a physical change.}
2. **Formation of manure from leaves is a physical change. (False)**
   { Formation of manure from leaves is a chemical change.}
3. **Iron pipes coated with zinc do not get rusted easily. (True)**
4. **Iron and rust are the same substances. (False)**
   { Iron and rust are the different substances.}
5. **Condensation of steam is not a chemical change. (True)**

Question 3. Fill in the blanks in the following statements :

(a) When carbon dioxide is passed through lime water, it turns milky due to the formation of **Calcium carbonate.**

(b) The chemical name of baking soda is **Sodium hydrogen carbonate.**

(c) Two methods by which rusting of iron can be prevented are **painting** and **galvanization.**

(d) Changes in which only **physical** properties of a substance change are called physical changes.

(e) Changes in which new substances are formed are called **chemical** changes.

Question 4. When baking soda is mixed with lemon juice, bubbles are formed with the evolution of a gas. What type of change is it? Explain.

Answer- It is a chemical change. Here, a new substance carbon dioxide gas is formed.

Question 5. When a candle burns, both physical and chemical changes take place. Identify these changes. Give another example of a familiar process in which both the chemical and physical changes take place.

Answer- Candle Burning- (1) Physical change is melting of wax,

(2) The chemical change is the burning of thread with the evolution of CO_2.

Digestion of Food- (1) Physical change is the breakdown of larger food molecules to simpler ones.

(2) The chemical change is the digestion of food by the action of HCl and enzymes.

Question 6. How would you show that setting of curd is a chemical change?

Answer- Because curd is a new substance formed. It has different properties than milk.

Question 7. Explain why burning of wood and cutting it into small pieces are considered as two different types of changes.

Answer- Cutting of wood is a physical change as it does not change the nature of the wood. On the other hand, burning of wood is a chemical change as wood is converted to ash with the liberation of CO_2.

Question 8. Describe how crystals of copper sulphate are prepared.

Answer- To purify copper sulphate from an impure sample, we prepare crystals of copper sulphate. A cup of water is taken in a beaker and a few drops of dilute sulphuric acid are added into it. The water is heated. When it starts boiling, copper sulphate powder is added slowly while stirring continuously to make a saturated solution. The solution is filtered and allowed to cool down. Crystals of copper sulphate slowly form at the bottom of the beaker.

Question 9. Explain how painting of an iron gate prevents it from rusting.

Answer- For rusting, iron must be in contact with both air and moisture. When Iron Gate is painted, the layer of paint cuts the contact between air, moisture and iron. Thus, it prevents rusting.

Question 10. Explain why rusting of iron objects is faster in coastal areas than in deserts.

Answer- Rusting of iron requires contact with water(moisture) and oxygen. In coastal areas, humidity is more in comparison to that in deserts; hence, rusting of iron objects is faster in coastal areas than in deserts.

Question 11. The gas we use in the kitchen is called liquefied petroleum gas (LPG). In the cylinder it exist as a liquid. When it comes out from the cylinder it becomes a gas (Change – A) then it burns (Change – B). The following statements pertain to these changes. Choose the correct one.

(i) Process – A is a chemical change.

(ii) Process – B is a chemical change. **(✓)**

(iii) Both processes A and B are chemical changes.

(iv) None of these processes is a chemical change

Question 12. Anaerobic bacteria digest animal waste and produce biogas (Change – A). The biogas is then burnt as fuel (Change – B). The following statements pertain to these changes. Choose the correct one.

(i) Process – A is a chemical change.

(ii) Process – B is a chemical change

(iii) Both processes A and B are chemical changes. **(✓)**

(iv) None of these processes is a chemical change.

CHAPTER – 15 LIGHT

Question 1. Fill in the blanks.

(a) An image that cannot be obtained on a screen is called **virtual image.**

(b) Image formed by a convex **mirror** is always virtual and smaller in size.

(c) An image formed by a **plane** mirror is always of the same size as that of the object.

(d) An image which can be obtained on a screen is called a **real** image.

(e) An image formed by a concave **lens** cannot be obtained on a screen

Question 2. Mark 'T' if the statement is true and 'F' if it is false:

(a) We can obtain an enlarged and erect image by a convex mirror. **(False)**

(b) A concave lens always forms a virtual image. **(True)**

(c) We can obtain a real, enlarged and inverted image by a concave mirror. **(True)**

(d) A real image cannot be obtained on a screen. **(False)**

(e) A concave mirror always forms a real image. **(False)**

Question 3. Match the items given in Column I with one or more items of Column II.

Column-I	Column-II
(a) A plane mirror	(i) Used as a magnifying glass
(b) A convex mirror	(ii) Can form image of objects spread over a large area.
(c) A convex lens	(iii) Used by dentists to see enlarged image of teeth.
(d) A concave mirror	(iv) The image can be inverted and magnified
(e) A concave lens	(v) The image is erect and of the same size as the object.
	(vi) The image is erect and smaller in size than the object.

Question 4. State the characteristics of the image formed by a plane mirror

Answer- Plane mirror forms an erect, virtual, laterally inverted image behind the mirror. It is of the same size and is at the same distance from the mirror as the object is in front of it.

Question 5. Find out the letters of English alphabet or any other language known to you in which the image formed in a plane mirror appears exactly like the letter itself. Discuss your findings.

Answer- A, H, I, M, O, T, U, V, W, X and Y. Because these alphabets are laterally symmetric.

Question 6- What is a virtual image? Give one situation where a virtual image is formed.

Answer- Ther image that cannot be obtained on a screen is called virtual image. The image formed by a plane mirror is always virtual.

Question 7. State two differences between a convex and a concave lens.

Answer-

Convex Lens	Concave Lens
1. Thick in the middle and thin at the edges.	1. Thin in the middle and thick at the edges.
2. Can form real image.	2. Always form virtual image.
3. Converging lens.	3. Diverging lens.

Question 8. Give one use each of a concave and a convex mirror.

Answer- Concave mirrors are used in the headlight of cars and scooters.

Convex mirrors are used as side-view mirrors in vehicles.

Question 9. Which type of mirror can form a real image?

Answer- Concave mirror can form real image.

Question 10- Which type of lens forms always a virtual image?

Answer- Concave lens always form virtual image.

Choose the correct option in questions 11–13

Question 11- A virtual image larger than the object can be produced by a:

(i) concave lens (ii) concave mirror **(✓)** (iii) convex mirror (iv) plane mirror.

Question 12- David is observing his image in a plane mirror. The distance between the mirror and his image is 4 m. If he moves 1 m towards the mirror, then the distance between David and his image will be:

(i) 3 m (ii) 5 m (iii) 6 m **(✓)** (iv) 8 m.

Question 13- The rear view mirror of a car is a plane mirror. A driver is reversing his car at a speed of 2 m/s. The driver sees in his rear view mirror the image of a truck parked behind his car. The speed at which the image of the truck appears to approach the driver will be:

(i) 1 m/s (ii) 2 m/s (iii) 4 m/s **(✓)** (iv) 8 m/s.

CHAPTER- 16 WATER: A PRECIOUS RESOURCE

Question 1. Mark 'T' if the statement is true and 'F' if it is false:

(a) The freshwater stored in the ground is much more than that present in the rivers and lakes of the world. **(True)**

(b) Water shortage is a problem faced only by people living in rural areas. **(False)**

(c) Water from rivers is the only source for irrigation in the fields. **(False)**

(d) Rain is the ultimate source of water. **(False)**

Question 2. Explain how groundwater is recharged?

Answer- The rainwater and water from other sources such as rivers and ponds seeps through the soil and fills the empty spaces and cracks deep below the ground. The process of seeping of water into the ground is called infiltration. The groundwater thus gets recharged by this process.

Question 3. There are ten tube wells in a lane of fifty houses. What could be the long term impact on the water table?

Answer- The water table will deplete. Time will come when water table fall below the pipe of tubewells. No water will be fetched by these any more.

Question 4. You have been asked to maintain a garden. How will you minimise the use of water?

Answer- We can reduce the usage of water for gardening by adopting drip irrigation method.

Question 5. Explain the factors responsible for the depletion of water table.

Answer- (1) Increase in population: Increase in population leads to increased demand for water for domestic and drinking purpose. This reduces the water table.

(2) Industrialization: Industries need lot of water for manufacturing purposes. This reduces the water table.

(3) Agriculture: Agriculture requires a lot of water for growing crops; this results in depletion of water table.

Question 6- Fill in the blanks in the following:

(a) People obtain groundwater through **tube wells** and **hand pumps.**

(b) Three forms of water are **ice (solid), water (liquid)** and **vapours (gas)**.

(c) The water bearing layer of the earth is **Hydrosphere**.

(d) The process of water seepage into the ground is called **infiltration**.

Question 7. Which one of the following is not responsible for water shortage?

(i) Rapid growth of industries.

(ii) Increasing population.

(iii) Heavy rainfall. **(✓)**

(iv) Mismanagement of water resources.

Question 8. Choose the correct option. The total water-

(i) in the lakes and rivers of the world remains constant.

(ii) under the ground remains constant.

(iii) in the seas and oceans of the world remains constant.

(iv) of the world remains constant. **(✓)**

Question 9. Make a sketch showing groundwater and water table. Label it.

Answer-

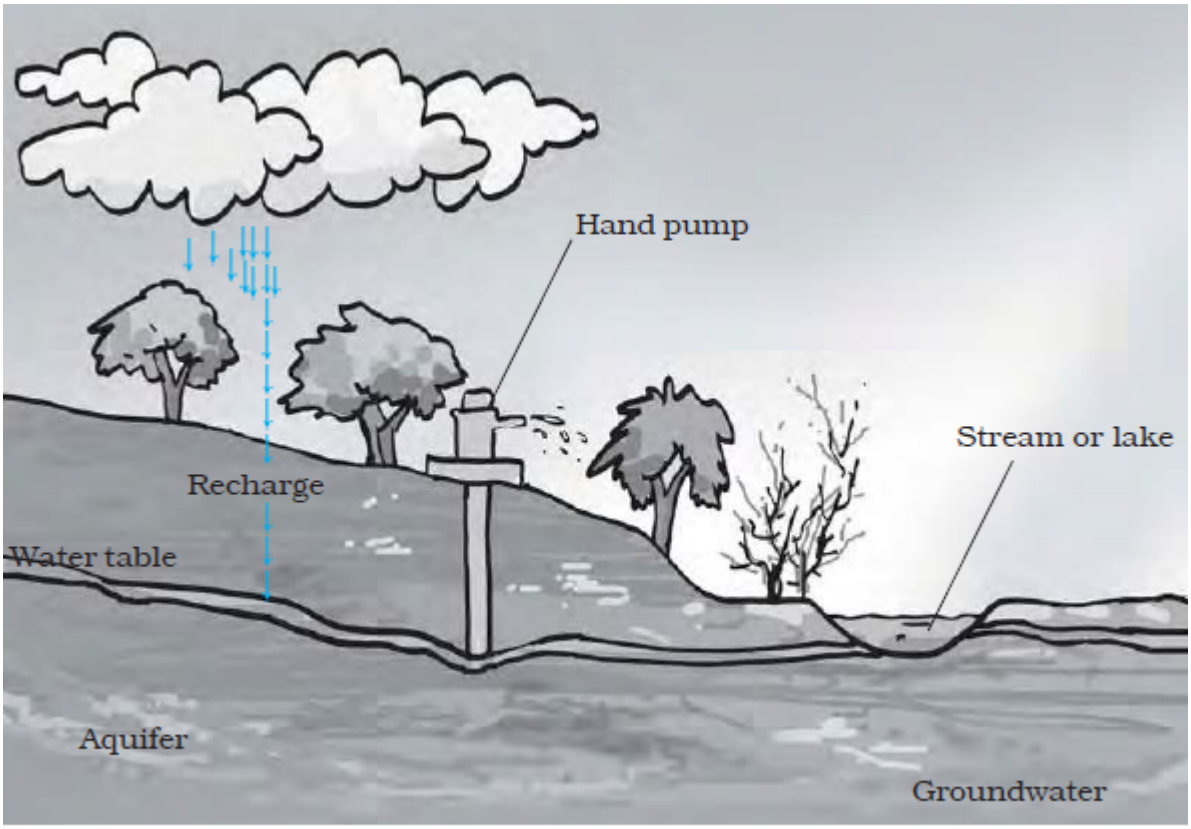


Fig. 16.7 Groundwater and water table

CHAPTER- 18 WATER: WASTE WATER STORY

Question 1. Fill in the blanks:

(a) Cleaning of water is a process of removing **pollutants**.

(b) Wastewater released by houses is called **sewage**.

(c) Dried **sludge** is used as manure.

(d) Drains get blocked by **cooking oil** and **fats**.

Question 2. What is sewage? Explain why it is harmful to discharge untreated sewage into rivers or seas.

Answer- Wastewater released by houses, factories and agriculture works is called **sewage**. Untreated sewage should not be discharged untreated into the sea because sewage consists of pollutants and harmful microorganisms which will contaminate water causing disease in people using contaminated water.

Question 3. Why should oils and fats be not released in the drain? Explain.

Answer- Oils and fats should not be released in drain, because they can harden and block the pipes. In an open drain, the fats clog the soil pores, reducing its effectiveness in filtering water.

Question 4. Describe the steps involved in getting clarified water from wastewater.

Answer- Following steps are involved in getting clarified water from waste water:

(i) Firstly, wastewater is passed through bar screens. Large objects like rags, sticks, cans, plastic packets, napkins are removed.

(ii) Water then, goes to a grit and sand removal tank to allow sand, grit and pebbles to settle down.

(iii) The water is then allowed to settle in a large tank which is sloped towards the middle. Solids like faeces settle at the bottom and are removed with a scraper.

(iv) Air is pumped into the clarified water to help aerobic bacteria to grow. Bacteria consume human waste, food waste, soaps and other unwanted matter still remaining in clarified water.

(v) Sometimes it may be necessary to disinfect water with chemicals like chlorine and ozone.

Question 5. What is sludge? Explain how it is treated.

Answer- Solids like faeces settle at the bottom while treating sewage is called as sludge. Sludge can be treated as follows:

Sludge is removed using a skimmer and then transferred to a tank where it is decomposed by anaerobic bacteria to produce biogas.

Question 6- Untreated human excreta is a health hazard. Explain.

Answer- Because it consists of various disease-causing microorganisms and pollutants that will contaminate the soil and water resources, which may cause many diseases.

Question 7. Name two chemicals used to disinfect water.

Answer- Chlorine and Ozone.

Question 8. Explain the function of bar screens in a wastewater treatment plant.

Answer- Bar screen removes large objects like rags, sticks, cans, plastic packets and napkins.

Question 9. Explain the relationship between sanitation and disease.

Answer- Sanitation and disease are interrelated, as lack of sanitation lead to illness and good sanitation practices prevent the diseases.

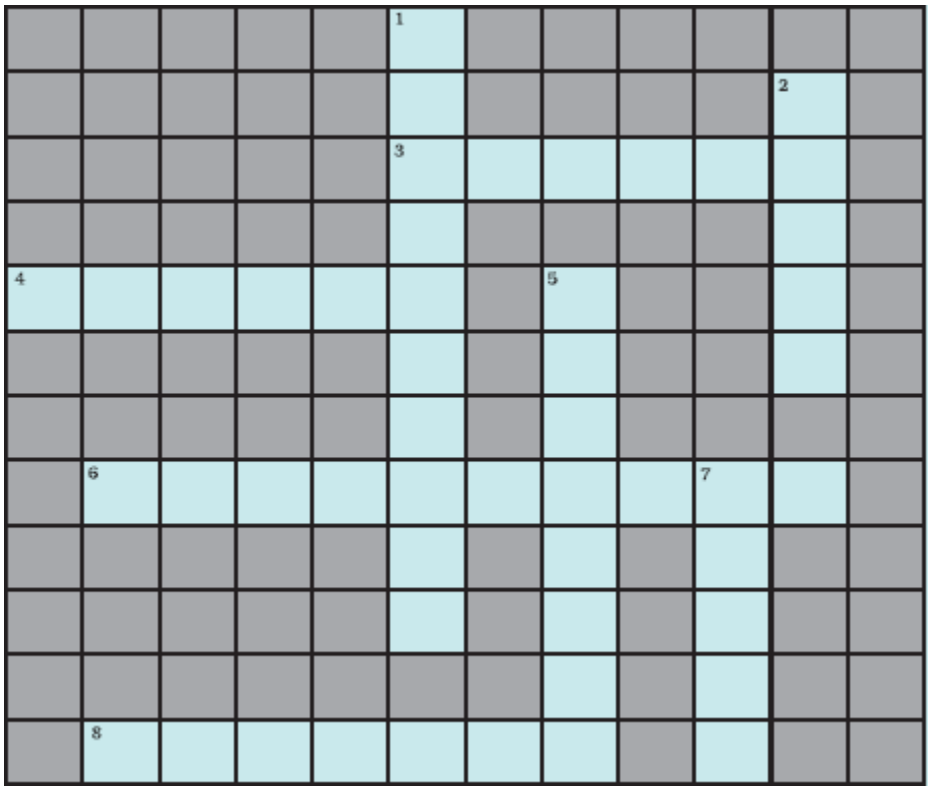
Question 10. Outline your role as an active citizen in relation to sanitation.

Answer- (1) Ensure that our surroundings are kept clean.

(2) The sewage system in the house should be properly managed.

(3) Report to the concerned authorities immediately in case of leakages in sewage pipes.

Question 11. Here is a crossword puzzle: Good luck!



Across

3. Liquid waste products - Sewage

4. Solid waste extracted in sewage treatment - Sludge

6. A word related to hygiene - Sanitation

8. Waste matter discharged from human body - Excreta

Down

1. Used water - Wastewater

2. A pipe carrying sewage - Sewer

5. Micro-organisms which causes cholera - Bacteria

7. A chemical to disinfect water- Ozone

Question 9. Study the following statements about ozone:

(a) It is essential for breathing of living organisms.

(b) It is used to disinfect water.

(c) It absorbs ultraviolet rays.

(d) Its proportion in air is about 3%.

Which of these statements are correct?

(i) (a), (b) and (c)

(ii) (b) and (c) **(✓)**

(iii) (a) and (d)

(iv) All four