



Class: VII	DEPARTMENT: SCIENCE 2023-24	DATE: 09-08-2023
WORKSHEET NO: 5 WITH ANSWERS	TOPIC: WATER: A PRECIOUS RESOURCE & WASTEWATER STORY	NOTE: A4 FILE FORMAT
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.

I. OBJECTIVE-TYPE QUESTIONS

1. Which of the following sources of domestic wastewater is most likely to be rich in inorganic waste but have very low organic matter content?

- a) Toilets
- b) Kitchen sinks
- c) Shower drains**
- d) Garden run-off water

2. Kitchen waste in the form of small food particles, used tea leaves, grease etc. is suggested to be disposed of along with other organic waste such as fruit peels, etc. in the trash. However, most households end up disposing of oils, tea leaves etc, down the kitchen sink, for convenience. Which of the following is the best argument to get households to curb this practice?

- a) The organic waste should be buried in soil, outside the house.
- b) Organic and inorganic waste should be disposed of, separately.
- c) The decomposing organic waste can create a foul smell in kitchens.
- d) Small food particles, oils and fats clog smaller drains in sewerage.**

3. In a small village, due to the contamination of a water resource, several residents simultaneously got affected by dysentery. What measures can be taken in households, to ensure protection from such waterborne diseases?

- a) Boil the tap water before cooking or drinking.**
- b) Test the tap water for bacterial culture growth.
- c) Disinfect the village water supply using UV light.
- d) Filter the water before irrigating fields of food crops.

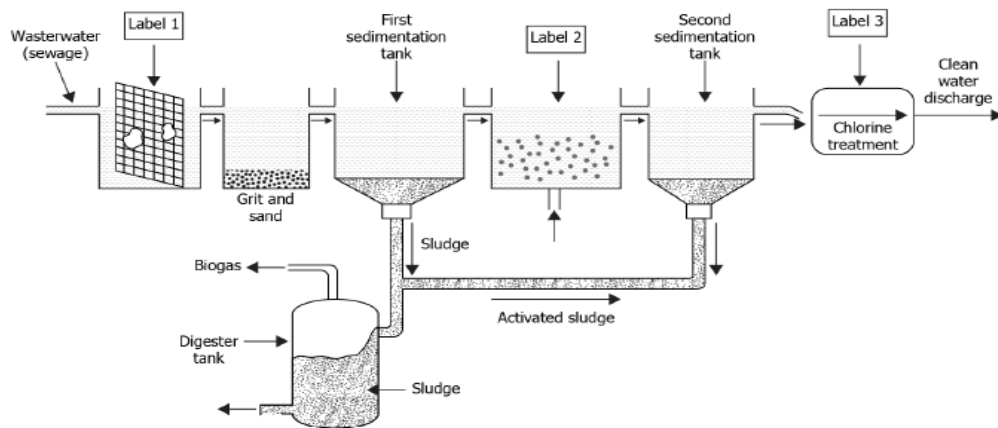
4. Select the disease that is caused due to improper disposal of sewage.

- a) Rickets
- b) Heart attack
- c) Cholera**
- d) Goitre

5. Which of the following is a characteristic of wastewater?

- i) Foul smell
 - ii) Bad taste
 - iii) Free from germs
 - iv) Dirty appearance
- a) Only i
b) Only ii
c) Both i and iv
d) i, ii and iv

6. Consider the following layout of an urban wastewater treatment plant.



In the layout, what do the labels, 1, 2, and 3 correspond to?

- a) 1: Bar screen, 2: Aeration, 3: Disinfection**
b) 1: Sand filtration, 2: Settling tank, 3: Sludge collector
c) 1: Settling tank, 2: Anaerobic digestion, 3: Disinfection
d) 1: Grit removal, 2: Aeration, 3: Third sedimentation tank

For the following questions, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii), and (iv) as given below

- i) Both A and R are true and R is the correct explanation of the assertion.*
- ii) Both A and R are true but R is not the correct explanation of the assertion.*
- iii) A is true but R is false.*
- iv) A is false but R is true*

7. **Assertion (A):** We should not drink contaminated water.

Reason (R): Contaminated water is free from germs and toxic substances.

Ans: iii) A is true but R is false.

8. **Assertion (A):** Wastewater is treated in sewage treatment plants.

Reason (R): Wastewater is treated to remove harmful components and make them reusable.

Ans: i) Both A and R are true and R is the correct explanation of the assertion.

9. **Assertion (A):** Sewage is liquid waste.

Reason (R): The dissolved and suspended impurities present in sewage are known as contaminants.

Ans: ii) Both A and R are true but R is not the correct explanation of the assertion.

10. **Assertion (A):** The underground network of big and small pipes that carries sewage from point of being produced to the point of disposal is known as sewerage.

Reason (R): Manholes are located every 50 m to 60 m in the sewerage.

Ans: ii) Both A and R are true but R is not the correct explanation of the assertion.

II. VERY SHORT QUESTIONS (2M):

1. What is meant by wastewater? **[Hint: Water contaminated with harmful and undesirable substances is called wastewater.]**

2. Explain the function of bar screens in a wastewater treatment plant. **[Hint: Bar screens clear the wastewater of all the physical impurities. Large-size waste like napkins, plastics, cans etc. is removed from the wastewater through the bar screens.]**

3. Define the following terms:

i) Aquifer **[Hint: The groundwater stored between layers of hard rock below the water table is called an aquifer.]**

ii) Infiltration **[Hint: The process of seeping of water into the ground.]**

4. Untreated human excreta is a health hazard. Justify this statement. **[Hint: Untreated human excreta can cause a lot of health-related problems. It pollutes water, air and soil. The polluted water contains disease-causing bacteria which can spread diseases like cholera, typhoid etc.]**

5. What are the chemicals that are used to disinfect water? **[Hint: Chlorine and Ozone]**

6. What is rainwater harvesting? Name some other methods to conserve water. **[Hint: The process of collecting rainwater from rooftops in a trench below in tanks can be used for washing, watering plants and recharging wells. The other methods include drip systems, construction Tanka, Bawri etc.]**

III. SHORT ANSWER TYPE QUESTIONS: (3M)

1. Why should we not throw- (a) used tea leaves into the sink?

(b) Cooking oil and fats down the drain?

[Hint: (a) We should not throw used tea leaves into the sink because it may block the drain pipe of the sink and do not allow the free fall of wastewater through them.

(b) We should not throw cooking oil and fats down the drain because they can harden and block the drainage pipes. In an open drain, the fats clog the soil pores reducing its effectiveness in filtering water.]

2. Explain the relationship between sanitation and disease.

[Hint: Sanitation and disease are related to each other. Sanitation involves the proper disposal of sewage and refuse from houses and public places. If sanitation is there, no disease will occur, but if sanitation is not done various types of disease will occur and spread. So, sanitation should be maintained to avoid disease.]

3. Outline your role as an active citizen in sanitation.

[Hint: As active citizens, we should take care of our environmental sanitation. We should make people aware of the benefits of sanitation. We should help municipal corporations to cover all the open drains and remove disease-causing substances thrown in the open.]

4. What is meant by sewage? What are the various constituents of sewage? **[Hint: Sewage is wastewater released by homes, industries, hospitals, offices and other users. It also includes rainwater that has run down the street during a storm or heavy rain. The water that washes off roads and rooftops carry harmful substances with it. Sewage is a liquid waste. The various constituents include-**

Organic impurities – Human faeces, animal waste, oil, urea (urine) waste, oil, herbicides, fruit and vegetable waste, etc.

Inorganic impurities – Nitrates, Phosphates, metals.

Nutrients – Phosphorus and Nitrogen.

Bacteria – Such as which cause cholera and typhoid.

Other microbes – Such as those which cause dysentery.]

5. Write some simple steps to conserve water.

[Hint: 1. Turn off taps while brushing your teeth.

2. Mop the floor instead of washing.

3. Take shorter showers-5 minutes or less.

4. Leaking taps or water pipes should be repaired immediately.]

IV. LONG ANSWER TYPE QUESTIONS. (5M)

1. Describe various steps of cleaning wastewater in a wastewater treatment plant.

[Hint: The various steps are: (a) Wastewater is passed through bar screens. Large objects like rags, sticks, cans, plastic packets, and napkins are removed.

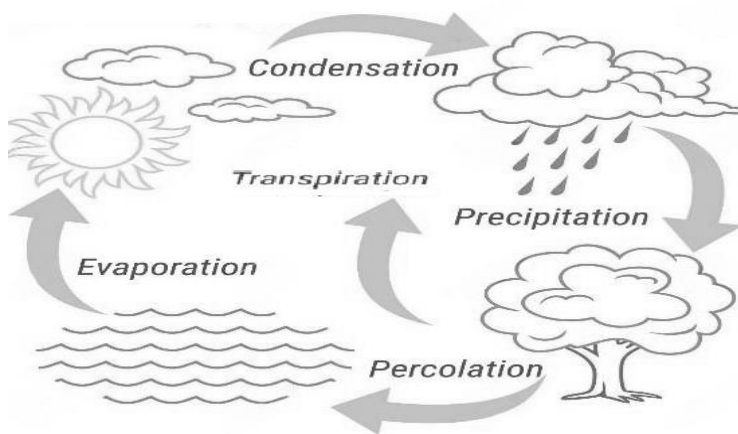
(b) Water then goes to a grit and sand removal tank. The speed of the incoming wastewater is decreased to allow sand, grit and pebbles to settle down.

(c) The water is then allowed to settle in a large tank which is sloped towards the middle. Solids like faeces settle at the bottom (these solid impurities are called sludge) and are removed with a scraper. The skimmer removes floatable solids like oil and grease. Water so cleared is called clarified water.

(d) 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. All disease-causing bacteria are removed by chlorination]

2. Explain the water cycle with a diagram.

[Hint: It is a continuous cycle where water on the earth's surface evaporates due to the heat of the sun. The evaporated water travels and becomes a part of the clouds. It falls down as rainwater or snow or hail due to precipitation and then evaporates again. The process repeats again and is called the water cycle.]



V. SOURCE-BASED/ CASE STUDY-BASED QUESTIONS

Read the passage and answer the following questions:

a. A design of a toilet in which human excreta is treated by earthworms has been tested in India. It has been found to be a novel; low-water use toilet for the safe processing of human waste. The operation of the toilet is very simple and hygienic. The human excreta are completely converted to vermi cakes –a resource much needed for soil.

1. What is a vermi-processing toilet? **[Hint: Vermi-processing toilets are those toilets in which human excreta is treated by earthworms.]**
2. Mention the advantages of a vermi- processing toilet? **[Hint: These are low-water use toilets for the safe processing of human waste, the operation of the toilet is very simple and hygienic.]**
3. What are vermi cakes? **[Hint: Vermi-processing toilets is a design of a toilet in which human excreta is treated by earthworms. In this process, human excreta is completely converted to cake-like substances called vermi cakes by earthworms.]**
4. Write the use of vermi cakes. **[Hint: Vermi cakes are used mostly in the soil as manure and fertilisers as they are rich in nutrients]**

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