# WASTEWATER STORY

## EXERCISE SOLUTION

**Question 1:**

Fill in the blanks.
(a) Cleaning of water is a process of removing _____.
(b) Wastewater released by houses is called _____.
(c) Dried _____ is used as manure.
(d) Drains get blocked by _____ and _____.

**Answer:**
(a) pollutants
(b) sewage
(c) sludge
(d) solid food remains, oil



**Question 2:**
What is sewage? Explain, why it is harmful to discharge untreated sewage into rivers or sea?

**Answer:**
Sewage is the wastewater containing both liquid and solid wastes (suspended solids) produced by human activities in homes, industries, hospitals, offices, etc.

Sewage contains various contaminants including disease-causing bacteria and other microbes. If untreated sewage is discharged into rivers or sea, then the water in the rivers or sea would get contaminated.

If this contaminated water is used for drinking, it can cause diseases such as cholera, typhoid, dysentery, etc., which may lead to death. That is why it is harmful to discharge untreated sewage into rivers or the sea.

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

**Answer:**
Oils and fats should not be released into drains because they can solidify and clog pipes, leading to blockages in the drainage system. These substances do not mix with water and can accumulate in sewer lines, creating "fatbergs" that disrupt the flow of wastewater. Additionally, oils and fats can harm aquatic life if they reach water bodies, as they form a layer on the water's surface, reducing oxygen levels. This can affect the ecosystem and water quality. Proper disposal of oils and fats, such as collecting and recycling or discarding them in designated bins, helps prevent these environmental and infrastructural issues.

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

**Answer:**
The process of obtaining clarified water from wastewater involves several steps:

1. **Screening**: Large solid objects like plastics and rags are removed using screens.
2. **Grit and Sand Removal**: The wastewater is allowed to flow through grit chambers where sand and heavy particles settle at the bottom.
3. **Sedimentation**: The water is transferred to sedimentation tanks where solid waste (sludge) settles at the bottom, and grease/oil floats to the top.
4. **Aeration**: Air is pumped into the water to encourage the growth of bacteria that decompose organic waste.
5. **Filtration**: The treated water is filtered to remove remaining impurities, resulting in clarified water ready for reuse or safe disposal.

**Question 5:**
What is sludge? Explain, how it is treated?

**Answer:**
Collected semi-solid wastes such as faeces that settle down during wastewater treatment are called sludge.

The sludge is removed by using a scraper and then transferred to a tank where it is decomposed by anaerobic bacteria to produce biogas. This biogas is used as a low-cost fuel for heating, cooking, etc. Activated sludge produced by the decomposition of bacteria is used as manure.

**Question 6:**
Untreated human excreta is a health hazard. Explain.

**Answer:**
Human excreta may cause water pollution and soil pollution, leading to many health-related problems. Water polluted with excreta contains disease-causing bacteria, which can spread epidemics and become the most common route for water-borne diseases like cholera, dysentery, typhoid, etc. The untreated human excreta pollutes soil and water resources (including underground water). When contaminated water is used for drinking, it can cause severe diseases such as cholera, typhoid, hepatitis, dysentery, etc., which may even lead to death.



**Question 7:**
Name two chemicals used to disinfect water.

**Answer:**
Two chemicals used to disinfect water are chlorine and ozone.

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

**Answer:**
The wastewater is allowed to pass through bar screens so that large solid objects such as rags, napkins, cans, plastic bags, polythene, etc., present in the wastewater can be removed during the filtration process.

**Question 9:**
**Explain the relationship between sanitation and disease.**

**Answer:**
Sanitation and disease are closely related. A lack of sanitation can cause diseases. In our country, many people still do not have sewerage facilities and defecate in open fields, railway tracks, etc., leading to contamination of water and soil. This can cause serious diseases like cholera, typhoid, and dysentery, which can even be fatal.

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

**Answer:**
As an active citizen, you can play a vital role in improving sanitation by:

1. **Promoting Awareness**: Educate others about the importance of hygiene and proper sanitation practices to prevent diseases.
2. **Avoiding Open Defecation**: Advocate for the use of toilets and discourage open defecation.
3. **Proper Waste Disposal**: Ensure proper segregation of biodegradable and non-biodegradable waste and use designated bins.
4. **Participating in Community Efforts**: Support local sanitation drives, such as cleaning public spaces and spreading awareness about waste management.
5. **Conserving Water**: Avoid wastage of water and promote its proper treatment and reuse.
6. **Reporting Issues**: Report broken sewer lines, overflowing drains, or other sanitation issues to local authorities.

By actively participating, you can help improve public health and environmental conditions.

**Question 11:**
**Study the following statements about ozone:**

1. It is essential for breathing of living organisms.
2. It is used to disinfect water.
3. It absorbs ultraviolet rays.
4. Its proportion in air is about 3%.

**Which of these statements are correct?**

(a) I, II, and III

(b) II and III

(c) I and IV

(d) All of the above

**Answer:**

(b) Ozone is used as a water disinfectant. It absorbs harmful ultraviolet rays from the Sun.