Chapter 18. Waste Water Story

Very Short Q&A:

Q1: What is sewage?

Ans: Waste water released by houses is called sewage.

Q2: What per cent of earth's water is fresh?

Ans: 3 per cent.

Q3: What constitutes waste water?

Ans: It can include human waste, food scraps and chemicals.

Q4: State one of the reasons for increasing scarcity of fresh water.

Ans: Population growth.

Q5: Which day is celebrated as Worlds Water Day?

Ans: 22 March

Q6: What is cleaning of water?

Ans: Cleaning of water is the process of removing pollutants before it enters a water body or is reused.

Q7: In order to have safe drinking water, it should be _____.

Ans: Boiled

Q8: What are the adverse effects of drinking contaminated water?

Ans: Drinking contaminated water results in diseases such as cholera, typhoid and diarrhoea. Polluted water can also prove fatal.

Q9: Water gets contaminated and scarcity of clean water is due to :

a. People take baths and wash clothes in rivers and lakes.
b. Many people bathe their animals in rivers and lakes.

c. Increase in the population, industries and improper disposal of waste
d. All of the above.

Ans: All of the above.

Q10: What is sewage treatment?

Ans: Pollutants in waste water can be removed in several stages, and this process is called "sewage treatment.

Q11: Sewage contains organic and _____ impurities.

Ans: Inorganic

Q12: Sewage contains disease-causing bacteria. True/False

Ans: True

Q13: Saprotrophic bacteriafeed on dead organisms.True/False

Ans: True

Q14: Sewage contains some harmful nutrients, such as _____and nitrogen.

Ans: Phosphorous

Q15: Wastewater has many impurities and these impurities should be removed by _____.

Ans: Water treatment.

Q16: What is the purpose of filtering waste water?

Ans: To remove large impurities.

Q17: What is a clarifier?

Ans: A clarifier is a tank with its central part inclined downwards so as to allow faeces to settle down. The inclined waste is then removed using a scraper.

Q18: Name some biological contaminants in water.

Ans: bacteria and microbes

Q19: Name the chemical used in water plant to clean water

Ans: Chlorine tablets or ozone.

Q20: Dried _ is used as manure.

Ans: Sludge

Q21: List the substances responsible for blockage of drain.

Ans: Tealeaves, solid food remains, soft toys, cotton, and sanitary towels.

Q22: Why should used tea leaves, solid food remains, etc. not be released in the drains?

Ans: Used tea leaves, solid food remains etc. should not be thrown down the drain as they may choke the drain.

Q23: What is the function of bar screens in waste water treatment plant?

Ans: The bar screen remove the large objects like rags, sticks, cans, plastics packets etc. from the sewage.

Q24: Why waste water is passed through bar screen?

Ans: Waste water is passed through bar screens to remove big objects like cans, sticks, rags etc.

Q25: What is the function of a skimmer?

Ans: A skimmer removes the floatable solids like oil, grease etc.

Q26: Why air is pumped into clarified water?

Ans: Air is pumped into clarified water to help aerobic bacteria to grow.

Q27: The suspended microbes in water treatment plant settle at the _____& the water is removed from the_____

Ans: Bottom and top.

Q28: State various uses of water.

Ans: Water is used for:

- Drinking
- Cooking
- Washing clothes, utensils
- Generating electricity
- Bathing

Q29: What is the actual reason behind improper sanitation?

Ans: lack of knowledge and of money, illiteracy, large population and lack of social awareness results in improper sanitation

Q30: Onsite sewage disposal systems collect human excreta and store it in a hole or a pipe, and later direct it to a sewage treatment plant.
True/False.

Ans: True

Q31: Septic tanks are not suitable for places such as hospitals, isolated buildings and clusters of houses where there is no
sewage.True/False

Ans: False

Q32: What kind of toilets are in aeroplanes and trains?

Ans: Chemical toilets

Q33: Public places such as railway stations, bus depots, airports and hospitals generate a lot of waste, which leads to diseases. True/False.

Ans: True

Q34: Solids like faeces settle at the bottom by _____ and are removed with a scraper.

Ans: Sedimentation

Short Q&A:

Q1: What is sewage? Explain why it is harmful to discharge untreated sewage into rivers or seas?

Ans: Sewage is waste water 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 carries harmful substances with it. Sewage is a liquid waste which has dissolved and suspended impurities as contaminants or pollutants. If this untreated sewage is discharged into rivers or seas, It may cause water pollution and soil pollution in which both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tube wells, springs and many rivers. Therefore if it gets polluted, it becomes the most common route for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

Q2: Oils and fats should not release in the drain. Explain why?

Ans: Cooking oil and fats should not be thrown down the drain. They can harden and block the pipes. In an open drain the fats clog the soil pores reducing its effectiveness in filtering water. Also they may kill microbes that help purify water. Therefor oil and fats should be always discharged after taking due care in the dustbin or if possible in some suitable dumping place.

Q3: What do you mean by waste water?

Ans: The dirty water which contains various impurities like dust, polythene bags, Vegetable peels, kitchen waste, oil & water that goes down the drains from sinks, showers, toilets, laundries etc. is waste water. Waste water cannot be used further.

Q4: Enlist the various causes of water pollution.

Ans: Water is polluted by various factors like:

1. Bathing of cattle in river bodies.
2. Washing of clothes & utensils by people in rivers.
3. Discharging wastes from factories, industries in nearby river bodies & ponds.

Q5: What is sludge and how is it treated?

Ans: Solid Faecal matter which is generated after the water treatment plant is known as sludge. The sludge is transferred to a separate tank where it is decomposed by anaerobic bacteria. The biogas produced can be used as a fuel & the dried sludge is used as manure for replenishing the nutrients of the soil.

Q6: What is sewage and sewage treatment?

Ans: The waste water that is being generated at homes, industries, agricultural activities, human activities etc. is called sewage.And sewage treatment is a process of removing

pollutants before it enters a water body or is refused.

Q7: Explain why is it harmful to discharge untreated sewage into Water bodies?

Ans: It is harmful to discharge the untreated sewage into the water bodies as it contains harmful substances. Most of it is water which has dissolved & suspended impurities which may pollute the water bodies & also harm the aquatic plants & animals.

Q8: Untreated human excreta are a health hazard. Justify the statement.

Ans: An untreated human excreta is a health hazard as it may cause water pollution. It pollutes both Surface water as well as ground water. Since ground water is a source of water for wells, tube wells etc. therefore it leads to waterborne diseases like cholera, jaundice, typhoid etc.

Q9: What do you understand by the term "sewerage"?

Ans: Sewerage is like a transport system that carries sewage from the point where it is being generated to the point of disposal i.e. treatment plant.

Q10: List few ways to control sewage generation.

Ans: Following are the ways to control sewage generation are:

- Leakage in sewer lines should be checked & repaired regularly.
- Do not defecate, spit or scatter litter in public places.
- Used tea leaves, solid food remains, toys, towels etc. should not be thrown in water pipe because these materials may choke the pipe.

Q11: What are the harmful effects of sewerage?

Ans: Accumulation of sewerage leads to:

1. Spread of various diseases.
2. Water pollution.
3. Discharge of sewerage in water bodies leads to excessive growth of algae.

Q12: Suggest some alternative arrangement for sewage disposal.

Ans: To improve sanitation, low cost onsite sanitation sewage disposals are being made. For example: septic tanks, composting pits etc.

Q13: Why bacteria are used in sewage treatment plants?

Ans: The bacteria decompose the suspended waste that includes domestic wastes & other undesirable organic substances present in the clarified water. The activity of bacteria produces decomposed organic material from which solid waste is separated. This solid waste is used as manure.

Q14: Explain the various steps involved in water treatment plant.

Ans: There are various steps involved in the water treatment plant which involves physical, chemical & biological processes:

- Waste water is passed through bar screens to remove big objects like cans, sticks, rags etc.
- The liquid material is then passed through sedimentation tank where solid waste like faecal matter, sand, grit settles down.
- This solid matter is then removed with the help of a scrapper. This is the sludge.
- A skimmer removes the floatable solids like oil, grease etc.
- The clear water so obtained is called clarified water.
- Air is pumped into clarified water to help aerobic bacteria to grow. The bacteria then consume the unwanted matter still present in clarified water.
- The suspended microbes settle at the bottom & the water is removed from the top

Q15: What is a manhole? Why are manholes made?

Ans: A manhole is a covered vertical hole in the ground, pavement or road above the underground sewer pipeline.

If there is any leakage or blockage in the underground sewer pipeline, the sanitary worker can go down, up to these sewer pipelines for cleaning or any repair.

Q16: Why chemicals should not be released in the drain?

Ans: Chemicals like paints, solvents, insecticides should not be thrown down the drain as it may kill the useful microbes that help to decompose the waster present in the sewage & purify water.

Q17: Explain why it is harmful to discharge untreated sewage into rivers or seas.

Ans: 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 carries harmful substances with it. Sewage is a liquid waste which has dissolved and suspended impurities as contaminants or pollutants. If this untreated sewage is discharged into rivers or seas, It may cause water pollution and

soil pollution in which both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tubewells, springs and many rivers. Therefor if it gets polluted, it becomes the most common route for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

Q18: An untreated human excreta is a health hazard. Explain.

Ans: Untreated human excreta is a health hazard because as this will result in poor sanitation. A very large fraction of our people defecates in the open, on dry riverbeds, on railway tracks, near fields and many a time directly in water. It may cause water pollution and soil pollution. Both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tubewells, springs and many rivers due to this, it becomes the most common carriers for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

Q19: Name the two chemicals used in treatment of water. When they are used?

Ans: In the last stage of "wastewater Treatment", the treated water has a very low level of organic material and suspended matter. It is discharged into a sea, a river or into the ground. Nature cleans it up further. Sometimes it may be necessary to disinfect water with chemicals like chlorine and ozone before releasing it into the distribution system.

Q20: Explain the relationship between sanitation and disease.

Ans: There is a direct relationship between sanitation and disease. Poor sanitation and contaminated drinking water is the cause of a large number of diseases. Under poor sanitation people may resort to defecate in the open, on dry riverbeds, on railway tracks, near fields and many a time directly in water. It may cause water pollution and soil pollution. Both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tubewells, springs and many rivers due to this, it becomes the most common carriers for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

Q21: State your role as an active citizen in relation to sanitation.

Ans: We can contribute in maintaining sanitation at public places. We should not scatter litter anywhere. If there is no dustbin in sight, we should carry the litter home and throw it in the dustbin. We must realise our responsibility in maintaining the water sources in a healthy state. We should adopt good sanitation practices as way of life. A small initiative as an agent of change on our part will make a great difference.

Q22: State the effects of poor sanitation.

Ans: Everyone must know about the adverse effects of poor sanitation. The problem is at its worst in villages, where proper sanitation is not available. Villagers defecate in the open, on dry river beds, railway tracks, fields and even directly in water. This cause's water and soil pollution. Moreover, it contaminates and affects ground water as well as surface water, resulting in diseases such as cholera, typhoid, polio, meningitis, hepatitis and dysentery.

Q23: Write short notes on Septic tank and chemical toilets.

Ans: Septic tanks are suitable for places such as hospitals, isolated buildings and clusters of houses where there is no sewage. Local governments or private corporations usually provide septic tanks in areas that have no direct connection to main sewage pipes. The septic tank system consists of a small sewage treatment system. Aeroplanes and trains usually have chemical toilets. A chemical toilet uses chemicals to disinfect human waste and remove its bad odour. That is why trains and aeroplanes do not have elaborate plumbs and sewage.

Q24: How water gets contaminated?

Ans: Water gets contaminated and scarcity of clean water is due to the following reasons:

- People take baths and wash clothes in rivers and lakes.
- Many people bathe their animals in rivers and lakes.
- Increase in the population, industries and improper disposal of waste.

Q25: Explain the various types of sewage.

Ans: There are various types of sewage, depending upon its colour and odour. Some sewage is black and has a very bad odour.

- Sullage water: Waste water released from the kitchen is called sullage water. The contaminants in sullage water are mild detergents, oils and food particles. Moreover, it contains lots of water released when utensils are washed.
- Foul waste: Waste water released from toilets is termed as foul waste. It consists of human waste and a lot of bacteria that release gases and bad odour. It is highly infectious.
- Trade waste: Waste released from industries and commercial organisations is called trade waste. It consists of acids and strong chemicals that are toxic in nature.

Long Q&A:

Q1: Describe the steps involved in getting clarified water from waste water.

Ans: The steps involved in getting clarified water from waste water involves physical, chemical, and biological processes, which remove physical, chemical and biological matter that contaminates the waste water.

1. Wastewater is passed through bar screens. Large objects like rags, sticks, cans, plastic packets, napkins are removed.
2. 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 through sedimentation.
3. The water is then allowed to settle in a large tank which is sloped towards the middle. Solids like faeces settle at the bottom by sedimentation and are removed with a scraper. This is the sludge. A skimmer removes the floatable solids like oil and grease. Water so cleared is called clarified water. The sludge is transferred to a separate tank where it is decomposed by the anaerobic bacteria. The biogas produced in the process can be used as fuel or can be used to produce electricity.
4. 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. After several hours, the suspended microbes settle at the bottom of the tank as activated sludge. The water is then removed from the top. The activated sludge is about 97% water. The water is removed by sand drying beds or machines. Dried sludge is used as manure, returning organic matter and nutrients to the soil. The treated water has a very low level of organic material and suspended matter. It is discharged into a sea, a river or into the ground. Nature cleans it up further.