Question:1

Describe the different sources of wastewater.

Solution:

The various sources of waste water are:

a. Agriculture: Wastewater from farms contain pesticides and animal wastes.

b. Industries: Wastewater generated from certain industries contains toxic chemicals such as lead and chromium.

c. Mining and Constructions: Large amounts of waste water is generated from mining methods and wastewater generated from constructions contains cement and other compounds

d. Hospitals and Offices: Waste water generated from hospitals and offices contain bacteria and germs

e. Domestic activities: Waste water generated from domestic activities includes solid particles like metal, plastics, detergents and human faeces.

Question:2

Explain the sewer system.

Solution:

Sewer system is a facility consisting of a system of pipelines to carry sewage. Sewage from our homes leaves through drain pipes and reaches sewer mains of the city. The sewage is then passed onto the wastewater treatment plants through larger pipes connected to the sewer mains underground. In order for the waste to flow easily, the sewer system has been given a slope. As the sewer pipes are underground, manholes are arranged at desired places so that persons can enter the sewers through the manhole and fix the blocked or leaky pipes.

Question:3

Explain how wastewater gets treated in a wastewater treatment plant.

Solution:

Wastewater gets treated in wastewater treatment plants in three stages. They are:

(a) Primary treatment: This stage is a mechanical process involving screening and settling of large particles from waste water using vertical bars and grit chambers. After screening water is passed into sedimentation tanks .

(b) Secondary treatment: This stage is a biological process which involves the breakdown of organic matter obtained from primary treatment with the help of bacteria, producing biogas. Water is sent into aeration tanks and air is blown through them to speed up the treatment of water.

(c) Tertiary treatment: This stage is a chemical process and the last stage in treatment of water. Chemicals are added to remove phosphorous and nitrogen from water. Bacteria and other germs are killed by the addition of chlorine.

Question:4

Write one word for each of the following.

1. Dirty water .....
2. Impurities in wastewater .....
3. The chemical process of waste water treatment plant .....
4. Wastewater that contains suspended impurities .....
5. The material that settles at the bottom of sedimentation tanks .....
6. Material that rises to the top in sedimentation tanks .....

Solution:

1. Waste water
2. Contaminants
3. Tertiary treatment
4. Sewage
5. Sludge
6. Scum

Question:5

Which one of these is a mechanical process of treating wastewater?

(a) Screening of wastes
(b) Digestion of wastes
(c) Disinfecting water
(d) Sedimentation tanks

Solution:

(a) Screening of wastes

Screening of wastes is a mechanical process to treat waste water.

Question:6

From which one of these does sewage pass through to remove larger impurities?

(a) Vertical bars
(b) Grit chamber
(c) Aeration tanks

(d) Sedimentation tanks

Solution:

(a) Vertical bars

Sewage passes through screens of vertical bars to remove larger impurities.

Question:7

Which one of these refers to the material that settles at the bottom in wastewater treatment?

(a) Sludge
(b) Scum
(c) Sewage
(d) None of these

Solution:

(a) Sludge

Sludge is the solid material that settles at the bottom in wastewater treatment.

Question:8

In which one of these is air blown onto the sewage?

(a) Grit chamber
(b) Aeration tanks
(c) Water tank
(d) Septic tank

Solution:

(b) Aeration tanks

In aeration tanks, air is blown onto the sewage to speed up the treatment of water.

Question:9

Improper management of sewage results in

(a) diseases
(b) contamination of water supply
(c) water pollution
(d) all of these

Solution:

(d) All of these

Improper management of sewage results in water pollution, diseases and also leads to

contamination of water supply.

Question:10

What is wastewater? What does it contain?

Solution:

Water that has been used for various human activities and has become dirty is called waste water. Waste water contains many suspended impurities. These impurities are called contaminants and the waste water containing the contaminants is called the sewage.

Question:11

Name the stages involved in treating wastewater.

Solution:

There are three stages involved in treating the wastewater. They are:

a. Primary stage (mechanical process)
b. Secondary stage (biological process)
c. Tertiary stage (chemical process)

Question:12

Differentiate between primary and secondary treatments in treating wastewater.

Solution:

Primary	Secondary stage
First stage of treating the waste water	Second stage of treating the waste water.
Primary treatment is a mechanical process.	Secondary treatment is a biological process.
The screened water is passed on to sedimentation tanks to obtain clarified water.	The water is passed on to aeration tanks to speed up the process of treatment of water by blowing air through it. Biogas is obtained at this stage.

Question:13

How can treated water be used again?

Solution:

The treated water obtained from the waste water treatment plants are discharged into the rivers and streams. This treated water is used again for drinking supplies, domestic purposes, irrigation purposes in agriculture and aqua culture.

Question:14

What happens to the sludge produced after wastewater passes through the sewage treatment plant?

Solution:

Sludge that is produced after the wastewater passes through the sewage treatment plant consists of organic matter and huge quantities of water. At this stage, the sludge is thickened so as to ease the sludge disposal and this is in done by three methods:

a. Incinerating: Sludge is burnt to ashes and used as a construction material
b. Dewatering: Sludge is dewatered and used in the production of fertilizers in combination with other wastes.
c. Solid composting: Sludge is composted to produce gases which can then be used as fuel.

Question:15

Why is it important to maintain proper sanitation in public places?

Solution:

It is essential to maintain proper sanitation in public places because a large crowd gathers at these places. Hence, waste generation is also large. If the waste is not disposed properly, the sewer system would clog up resulting in blockage of sewage pipes and sewage would be thrown back onto the roads.

Question:16

Describe the measures that can be adopted to control sewage generation.

Solution:

Some of the measures that can be employed to control the sewage generation are:

a. Proper disposal of household products such as medicines, beauty products, cleansers and paint. These products contain various chemicals which might not be removed by wastewater treatment plants

b. Using garbage cans to dispose plastics, meat, butter and cooking oils as they can clog drain pipes causing the sewage to overflow at homes or at public places.

c. Fixing the faulty pipes as the leaks in pipes can contaminate drinking water. It may also cause stagnation at some places making it a breeding place for mosquitoes and disease causing germs.

Question:17

Describe the problems faced due to improper management of sewage.

Solution:

Improper management of sewage gives rise to various problems such as contamination of water, water-borne diseases and water pollution. Discharge of untreated sewage into water bodies contaminate the water which cannot be consumed nor can be used for any domestic purposes. The contaminated water is also responsible for water-borne diseases such as jaundice, hepatitis and cholera. On the other hand, leakages or blocks in main water supply line to households cause the sewage to mix with water. This again leads to contamination of water and the consumption of such water results in dysentery and typhoid.