

Lab Exercises (20% of final mark)

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Started on	Wednesday, 28 August 2024, 12:35 PM
State	Finished
Completed on	Wednesday, 4 December 2024, 11:21 AM
Time taken	97 days 23 hours
Marks	12.00/15.00
Grade	0.52 out of 0.65 (80%)

Question 1

Partially correct

Mark 12.00 out of 15.00

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The Primary Treatment Process



1. Screening:

Wastewater entering the treatment plant includes items like wood, rocks, and even dead animals. Unless they are removed, they could cause problems later in the treatment process. Most of these materials are sent to a landfill 1.

2. Pumping:

The wastewater system relies on the force of gravity to move sewage 2 from your home to the treatment plant. So wastewater-treatment plants are located on low ground, often near a river into which treated water can be released. If the plant is built above the ground level, the wastewater has to be pumped up to the aeration 3 tanks (item 3). From here on, gravity takes over to move the wastewater through the treatment process.

3. Aerating:

One of the first steps that a water treatment facility can do is to just shake up the sewage and expose it to air. This causes some of the dissolved 4 gases (such as hydrogen sulfide, which smells like rotten eggs) that taste and smell bad to be released from the water. Wastewater enters a series of long, parallel concrete tanks. Each tank is divided into two sections. In the first section, air is pumped through the water.

As organic matter decays 5, it uses up oxygen. Aeration replenishes the oxygen. Bubbling oxygen through the water also keeps the organic material suspended 6 while it forces 'grit' (coffee grounds, sand and other small, dense particles) to settle out. Grit 7 is pumped out of the tanks and taken to landfills.

4. Removing sludge

Wastewater then enters the second section or sedimentation tanks. Here, the sludge 8 (the organic portion of the sewage) settles out of the wastewater and is pumped out of the tanks. Some of the water is removed in a step called thickening and then the sludge is processed in large tanks called digesters 9.

5. Removing scum

As sludge is settling to the bottom of the sedimentation tanks, lighter materials are floating to the surface. This scum 10, includes grease, oils, plastics, and soap. Slow moving rakes filtration 11 the scum off the surface of the wastewater. Scum is thickened and pumped to the digesters along with the sludge.

Many cities also use turbidity 12 in sewage treatment. After the solids are removed, the liquid sewage is filtered through a substance, usually sand, by the action of gravity. This method gets rid of almost all bacteria, reduces skim 13 and color, removes odors, reduces the amount of iron, and removes most other solid particles that remained in the water. Water is sometimes filtered through carbon particles, which removes organic particles. This method is used in some homes, too.

6. Killing bacteria

Finally, the wastewater flows into a 'chlorine contact' tank, where the chemical chlorine is added to kill bacteria 14, which could pose a health risk, just as is done in swimming pools. The chlorine is mostly eliminated as the bacteria are destroyed, but sometimes it must be neutralized by adding other chemicals. This protects fish and other marine organisms, which can be harmed by the smallest amounts of chlorine. The treated water (called effluent 15) is then discharged to a local river or the ocean.

Your answer is partially correct.
You have correctly selected 12.
The correct answer is:

The Primary Treatment Process



1. Screening:

Wastewater entering the treatment plant includes items like wood, rocks, and even dead animals. Unless they are removed, they could cause problems later in the treatment process. Most of these materials are sent to a [landfill]1.

2. Pumping:

The wastewater system relies on the force of gravity to move [sewage]2 from your home to the treatment plant. So wastewater-treatment plants are located on low ground, often near a river into which treated water can be released. If the plant is built above the ground level, the wastewater has to be pumped up to the [aeration]3 tanks (item 3). From here on, gravity takes over to move the wastewater through the treatment process.

3. Aerating:

One of the first steps that a water treatment facility can do is to just shake up the sewage and expose it to air. This causes some of the [dissolved]⁴ gases (such as hydrogen sulfide, which smells like rotten eggs) that taste and smell bad to be released from the water. Wastewater enters a series of long, parallel concrete tanks. Each tank is divided into two sections. In the first section, air is pumped through the water.

As organic matter [decays]⁵, it uses up oxygen. Aeration replenishes the oxygen. Bubbling oxygen through the water also keeps the organic material [suspended]⁶ while it forces 'grit' (coffee grounds, sand and other small, dense particles) to settle out [Grit]⁷ is pumped out of the tanks and taken to landfills.

4. Removing sludge

Wastewater then enters the second section or sedimentation tanks. Here, the [sludge]⁸ (the organic portion of the sewage) settles out of the wastewater and is pumped out of the tanks. Some of the water is removed in a step called thickening and then the sludge is processed in large tanks called [digesters]⁹.

5. Removing scum

As sludge is settling to the bottom of the sedimentation tanks, lighter materials are floating to the surface. This [scum]¹⁰, includes grease, oils, plastics, and soap. Slow moving rakes [skim]¹¹ the scum off the surface of the wastewater. Scum is thickened and pumped to the digesters along with the sludge.

Many cities also use [filtration]¹² in sewage treatment. After the solids are removed, the liquid sewage is filtered through a substance, usually sand, by the action of gravity. This method gets rid of almost all bacteria, reduces [turbidity]¹³ and color, removes odors, reduces the amount of iron, and removes most other solid particles that remained in the water. Water is sometimes filtered through carbon particles, which removes organic particles. This method is used in some homes, too.

6. Killing bacteria

Finally, the wastewater flows into a 'chlorine contact' tank, where the chemical chlorine is added to kill [bacteria]¹⁴, which could pose a health risk, just as is done in swimming pools. The chlorine is mostly eliminated as the bacteria are destroyed, but sometimes it must be neutralized by adding other chemicals. This protects fish and other marine organisms, which can be harmed by the smallest amounts of chlorine. The treated water (called [effluent]¹⁵) is then discharged to a local river or the ocean.

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