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Section:	C
Subject:	Wastewater Engineering
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Q NO: 1

Answer:

Wastewater Engineering:

It is called sanitary Engineering, also known as public health or wastewater engineering, is the application of engineering methods to upgrade the Sanitation of human communities and providing the removal and disposal of human waste and in addition to the supply of safe potable water.

The main application of Wastewater Engineering is to bring wastewater, which is no longer needed or nor suitable to use, back in use without concerning human health and environment, by the treatment of wastewater.

Applications in safeguarding the environment.

1) Irrigation purposes

Wastewater can be useful in the irrigation field after proper treatment.

2) Natural bodies of water

Natural fresh water bodies are polluted everyday by untreated wastewater, which is harmful for both humans and animals.

3) Ground water protection

Water is scare source, so we need to protect it. Primary source of wastewater are sewage, industry, agricultural runoff and urban runoff etc. Treatment of wastewater is essential to prevent contamination of drinking water from pollutants.

4) Helping the environment

Wastewater engineering reduces deforestation and soil salinity.

Q NO:2

Answer:

The relationship of wastewater generation with water supply of a locality is that;

If field measurement of wastewater of flow rate and actual wastewater flow rate data are not available, then water supply records (Domestic water supply, Industrial water supply) can often be used as an aid to estimate wastewater flow rates.

Q NO: 3

Answer:

The importance of wastewater characterization is to know about physical, chemical, and biological characteristics of wastewater, because due to this we know that wastewater is physically means that it will be in hard form and suspended solid are present in it.

Due to chemical characterization we know that the chemical present in wastewater, which are mostly came out from industries and to treated as they are.

Due to biological characterization we know that wastewater consist of bacteria, fungi, Algae, protozoa, and pathogenic microorganisms groups.

Q NO 4:

Answer:

There are three main characteristics of Wastewater which are given below.

1) Physical characteristics:

- Turbidity
- Odor
- Color
- Total solids and
- Temperature

2) Chemical characteristics:

- Chemical oxygen demand (COD)
- Total organic Carbon (TOC)
- Nitrogen, Phosphorus, Chlorides, Sulfate, and alkalinity.
- PH value
- Heavy metal, trace element and priority pollutant.

3) Biological characteristics:

- Biological Oxygen Demand (BOD)
- Oxygen required for nitrification
- And microbial population.

Q NO 5:

Answer:

Advantages and Disadvantages of Combined Sewerage System:

Advantages:

- Both domestic sewage and storm water are carried in a single sewer, so construction cost is less.
- The strength of domestic sewage is reduced because of dilution of storm water.
- The sewers are of large size, and therefore the chances of their chocking are rare. It is easy to clean them.
- In towns with narrow streets, this system is preferred.

Disadvantages:

- 1. Initial cost is high because of large dimensions of sewers.
- 2. Because of large size of sewer, their handling and transportation is difficult.
- 3. Due to the inclusion of storm water, the load on the treatment plant increases and ultimately increases treatment costs.
- 4. During heavy rain the sewer may be overflow and may thus create unhygienic conditions.
- 5. If the whole sewage is to be disposed off by pumping it is uneconomical.

Advantages and Disadvantages of Separate Sewerage System:

Advantages:

- Size of sewers is generally less.
- Since the sanitary sewage and storm water flows in a separate pipes, the quantity of sewage to be treated is less.
- As the sewer are smaller in section, they can be easily ventilated.
- Rain water can be discharged in to the streams or can be reused / recycled without any treatment.

Disadvantages:

- Since the sewers are of smaller size, it is difficult to clean them.
- 2. They are likely to get chocked / blocked.
- 3. Initial cost is high, when two separate sets are used.
- 4. Maintenance cost of system is also high.

When new systems are built, it is preferable to construct the separated system to prevent combined sewer overflow, limit the amount of highly-polluted wastewater and allow the reuse of surface water run-off, because the recent trends have been for the development of separate sewerage systems. By replacing the combined sewerage system with separate sewer systems, sewage and surface run-off can be managed in two separate systems. The main reason for

this, is that surface run-off is generally less polluted than wastewater, and that treatment of combined wastewater and surface run-off is difficult during heavy rain fall, resulting in untreated overflows.

From above discussion finally I recommended separate sewerage system for new township.

End