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(2)

Q1; What is waste water engineering? Briefly describe its applications in safeguarding the environment?

Ans; * Waste-Water-Engineering;

Waste-water engineering or sanitary engineering also known as public health engineering is the application of engineering methods to improve sanitation of human communities primarily by providing the removal and disposal of human waste, treatment and reuse application for various purposes.

*** Applications;**

Waste water engineering is directly related to improving environment by disposing off treated wastewater and thus reducing the risk of ground water contamination and safeguarding aquatic life. Protect nature's life beneficial ecosystem. The less water you see

use, the less runoff and waste water that end up in the ocean.

Q2. Briefly describe the relationship of waste water generation with water supply of a locality?

Ans; Waste water;

Waste water is any water that has been affected directly or indirectly by human use.

*** Relationship of wastewater generation with water supply**

There are several areas from which wastewater is generated which are given below.

(1) Domestic water (2) Industrial water

(1) Domestic water;

Domestic water includes

(4)

(1) Commercial areas (2) Institutional areas (3) Recreational areas (4) Residential areas

The water which is supplied to such type of areas 60-80 % of that water is wat waste while 20 % is used. So waste water is deeply related with supply of water.

→ If we want to calculate waste water we should know the fresh water quantity.

→ For calculation of waste water first we calculate quantity of fresh water through given methods.

(1) Arithematic increase method (2) Geometric increase method.

→ From these methods we calculate first the upcoming population for specified time.

→ Then we find quantity of fresh water for such population.

→ After finding the quantity of fresh water for such population we should be able to find out quantity of waste water. So waste water is totally depend on fresh water.

Q3 What is the importance of waste water characterization?

Ans Importance of waste water characterization:

A characterization of the waste water which provides a wide variety of information regarding the type and concentration of the contaminants present must be carried out to determine the type of contamination concerned with characterization of wastewater we determine the nature of contaminant

(Physical, chemical, biological) and then design waste water treatment plant according to the nature of contaminants. It will have an important role in waste water treatment plant because it will provide a physical, chemical & biological resources for treatment of waste water in plant.

Q4. Enlist physical, chemical and biological characteristics?

* Physical characteristics;

(1) Settleable solids
(2) Total solids (TS)
(3) Total suspended solids (TSS).
(4) Total dissolved solids (TDS).
(5) volatile and fixed solids (VS and FS).
(6) odor.
(7) Temperature.
(8) Density and specific gravity.
(9) Turbidity.
(10) Color.

* Chemical characteristics.

(1) PH value.
(2) organic matter (OM)
(3) Nitrogen contents.
(4) chloride contents.
(5) Fats, oil and greases.
(6) Sulphides, Sulphates and hydrogen gas.
(7) Toxics.
(8) Dissolved oxygen (DO).

* Biological characteristics of waste water.

(1) Bacteria.
(2) Fungi.
(3) Algae.
(4) Protozoa.
(5) Viruses.
(6) Pathogenic micro-organism groups.

Q5 What are the advantages and disadvantages of combine and separate sewarage system? Which Sewarage system will you recommend for a new proposed township your answer with justification?

* Advantages of combined sewarage System;

(1) Both domestic sewage and storm water are carried in a single sewer so construction cost is less.

(2) The strength of domestic sewage is reduced because of dilution of storm waters.

(3) The sewers are of large size and therefore the chances of their chocking are rare it is easy to clean them.

(4) In towns with narrow street is

preferred.

* Disadvantages of combined sewerage system;

(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 inclusion of storm water the load on the treatment plant increases treatment costs

(4) During heavy rain the sewer may be overflow and may thus create unhygenic conditions.

(5) If the whole sewage is to be disposed off by pumping it is uneconomical.

* Advantages of separate sewerage System.

(1) Size of sewers is generally less.

(2) Since the sanitary sewerage and storm water flows in a separate pipes the quantity of sewage to treated is less.

(3) As the sewer are smaller in section they can be easily ventillated.

(4) Rain water can be reused/ recycled without any treatment.

* Disadvantages of separate sewerage System.

(1) Since the sewers are of smaller size it is difficult to clean them.

(2) They are likely to get blocked

(3) Initial cost is high when two separate sets are used.

(4) Maintenance cost of system is also high.

* I recommend separate sewerage system for a new proposed township because senitary 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 ventillated. Rain water can be discharged into the stream or it can be reuse/recycled without any treatment.