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Q No 1:-

wastewater Engineering:-

wastewater 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. wastewater engineering is directly related to Improving environment by disposing off treated waste water and Thus reducing The risk of ground water contamination and safeguarding aquatic life.

"Application of wastewater Engineering in

Safeguarding The Environment:

wastewater Engineering is The Application of science and Engineering Principles to Improve The environment principles.

(air, water, and/or land resources), to provide healthful water, air, and land for human habitation and for other organisms, and to remediate polluted sites.

Primary objective of wastewater engineering is to provide a good sanitary environmental condition in a city.

Negative environmental effects can be decreased and controlled through public education, conservation, regulations, and the application of good engineering practices.

The recovery of sewage is an effective means of saving water resources and promoting the reuse of water resources. It is an important measure to reduce the pollution of sewage and protect the environment.

Q2:-

Ans:- The Relationship of wastewater generation with water supply of a locality is That;

→ If field measurement of waste water flow rates are not possible and actual waste water flowrate is not available, water supply records can often be used as an aid to estimate waste water flow rates.

→ In 2006, WHO guidelines recognize The Reality and Provide flexibility for countries to adopt a combination of treatment and not treatment options in order to manage health risk & progressively improve over time.

In situation where waste water flow rate data are limited or unavailable waste water flow rate estimate have to be developed from water consumption records in other information.

About 60-85% of supplied water per capita becomes waste water.

Simply wastewater generated is dependent on supplied water as

The supplied water increase the waste water will be more.

Q No 3:-

Importance of waste water

Characterization:

Ans:- The Importance of waste water characterization has continually been in the forefront of wastewater treatment. Primarily due to concerns of contamination surface waters. Even though the limitations are water-quality based, they apply to point source discharge to surface waters and municipal sewage treatment plants, not to subsurface discharges. Whereas discharge limits for surface water depend on the receiving water's capability to take in and incorporate waste water constituents and concentrations without violating water quality standards, the same should be applied to discharges to subsurface systems.

while calcium and magnesium ions promote flocculation of clay particles in soil, sodium ions cause dispersion of clay particle.

Biochemical oxygen demand and total suspended solids contents are common indicators of waste water strength. These two wastewater parameters have been of great interest to wastewater researchers, because of their impacts on biological clogging mat (biomat) formation within dispersal field trenches. Due to the variability in contaminant concentrations in wastewater across the food and beverage sector, facility-specific characterization of wastewater plays a significant role in treatment determinations and design. Setting effluent limitations based on dispersal area soils, flow analyses, efforts to ensure that drinking water.

Sources and The environment is Protected
for future generations. ↖ (This 2 sentance with Ans.3)



Q No 4:-

Ans:- Physical, Chemical and Biological characteristics of sewage are
The following.

(1) Physical characteristics of sewage:

Physical characteristics of sewage include

The following.

- > Settleable solids.
- > Total solids (TS).
- > Total suspended solid (TSS).
- > Total Dissolved solid (TDS).
- > Volatile and Fixed solid (Vs & Fs).
- > Odor.
- > Temperature.
- > Density.
- > Specific Gravity.
- > Turbidity.
- > colour.

(2) Chemical characteristics of sewage.

Chemical characteristics of sewage include

The following.

- > Ph value.
- > organic matter.

- Nitrogen Contents.
- chlorides contents.
- Fats, oils, and Greases.
- sulphides, sulphates, and Hydrogen gas.
- Toxics.
- Dissolved Oxygen. (DO)

(3) Biological characteristics of sewage.

The main micro-organisms of concern in wastewater treatment are:

- Bacteria.
- Fungi.
- Algae.
- Protozoa.
- viruses.
- Pathogenic micro-organisms groups

Q5:-

Ans: Combined Sewerage System:

Advantages:-

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 water.
3. The sewers are of large size, and therefore the chances of their choking are rare. It is easy to clean them.
4. 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.

Separate Sewerage System:-

Advantages:-

1. Size of sewers is generally less.
2. Since The sanitary sewage and storm water flows in a separate pipes, The quantity of sewage to be treated is less.
3. As The sewer are smaller in section, They can be easily ventilated.
4. Rain water can be discharged in to The stream or can be reused/ recycled without any treatment.

Disadvanges:-

1. Since The sewers are of ~~similar~~ ^{smaller} size, It is difficult to clean Them.
2. They are likely to get choked/ blocked.

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

4. Maintenance cost of system is also high.

The recommendation of sewage system for a new proposed township depend upon the intensity of rainfall of the area. If the rainfall in the area is less than combined sewerage system is better, because storm water will be less and both domestic sewage and storm water are carried in a single sewer, so construction cost is less.

But if the area concerned is of heavy rainfall then separate sewerage system is better because the domestic sewage and storm water will flow separately and the load on the sewers will be less. The quantity of sewage to be treated is less. And rain water can be discharged or can be recycled without any treatment.

END PAPER