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Section : B

Paper : Wastewater Engineering

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## Q.1. Wastewater Engineering:-

Sanitary engineering also known as public health or wastewater engineering is the application of engineering methods to improve the sanitation of human communities, primarily by providing the removal and disposal of waste, ~~water~~ and in addition to the supply of safe potable water.

### Applications of wastewater Engineering:-

1. By disposing off treated wastewater in order to reduce ground water contamination and protect aquatic life.

2. Wastewater engineering deals with the management of wastewater and its treatment to reuse it for various purpose.

3. 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 & protect the environment.

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

## Qno 2. Answer.

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

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

Similarly wastewater generated is dependent on supplied water as ~~as~~ the supplied water increases the wastewater will be more.

Q No 3.

### Wastewater characterization:-

A characterization of the wastewater, 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 wastewater treatment plant according to the nature of contaminants.

It will have an important role in wastewater treatment plant because it will provide a physical, chemical & biological resources for treatment of wastewater in plant.

Q NO. 21

Physical characteristics of Wastewater:-

Turbidity, color, total solids, and temperature.

Chemical characteristics of Wastewater:-

Chemical Oxygen demand (COD), Total organic carbon (TOC), nitrogen phosphorus, chlorides, sulfates, alkalinity, pH, Heavy metals, Trace elements and priority pollutants.

Biological characteristics of Wastewater:-

Biochemical Oxygen demand (BOD), Oxygen required for nitrification.

Microbial population.

Q No. 5.

**Advantages of combine sewerage system:**

→ 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 choking are rare. It is easy to clean them.

→ In town with narrow street, this system is preferred.

**Disadvantages of combine sewerage system:**

→ Initial cost is high because of large dimensions of sewers.

→ Because of large size of sewer, their handling and transportation is difficult.

Separate system:

Advantages:-

→ Size of sewer requires 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.

→ During disposal if the sewage is to be pumped, the separate system is cheaper.

→ Rain water can be discharge in to streams without any treatment

Disadvantages:-

→ Since the sewer are smaller size, it is difficult to clean them.



- They are likely to get shocked.
- Initial cost is high, ~~is~~ when ~~two~~ two separate set are used.
- Maintenance cost of sewer is also high.
- Generally self cleaning velocity is not available due to small quantity of sewage therefore, flushing is required at various point.

In a new proposed township I will recommended to a a combined sewerage system because both domestic sewage & storm water are carried in a single sewer so construction cost is less and sewers are of large size so they are easy to clean.