

Q1) what is waste water Engineering?  
Applications of waste water?

Ans:- **WASTE WATER ENGINEERING:-**

It is the application of engineering methods to improve sanitation of human communities primarily by providing the removal, disposal of human waste, treatment and reuse application for various purposes.

**APPLICATIONS:-**

Following are the applications

- 1) By disposing off treated waste water in order to reduce ground water contamination and protect aquatic life.
- 2) Waste water engineering deals with the management of waste water and its treatment to reuse it for various purposes.
- 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 pollution of sewage, protect environment.
- 4) Primary objective of waste water engineering is to provide a good sanitary environmental condition in a city.

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

Ans:- The 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 waste water generated is dependent on supply water, as the supplied water increases, the waste water will be more.

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

Q3) what is the importance of waste water characterization?

### \*1: WASTE WATER CHARACTERIZATION:

A characterization of waste water provides a wide variety of information regarding the type and concentration of contaminants presents. With characterization of waste water we determine the nature of contaminant (physical, biological, chemical) and then design waste water treatment plant according to the nature of contaminants.

The importance of waste water characterization is to know about physical chemical and biological characteristics of waste water because due to this we know that waste water is **physically** that it will be in hard form and suspended solids are present in it.

Due to **chemical** characterization, we know that the elements present in waste water which mostly come out from industries and to treat it as they are.

Due to **biological** characterization we know that the waste water has the bacteria present in it.

Q4) Explain Physical, chemical and biological characteristics of wastewater?

\*) ∴ CHARACTERISTICS OF WASTE WATER:-

### 1) PHYSICAL CHARACTERISTICS:-

- (1) turbidity
- (2) temperature
- (3) odor
- (4) total solids
- (5) colour

### 2) CHEMICAL CHARACTERISTICS:-

- (1) Priority pollutants
- (2) Heavy metals
- (3) phosphorus, chlorides
- (4) Total organic carbon (TOC)
- (5) trace elements
- (6) PH
- (7) nitrogen
- (8) chemical oxygen demand (COD)

### 3) BIOLOGICAL CHARACTERISTICS:-

- (1) Biological oxygen demand (BOD)
- (2) Microbial population (Bacteria, pathogens)
- (3) oxygen required for nitrification

Q5) what are the advantages and disadvantages of combined and separate sewerage system? which sewerage system will you recommend for a new proposed township support your answer with justification?

## 1) :- COMBINED SYSTEM:-

### :- ADVANTAGES:-

Following are the advantages of combined system.

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

### :- DISADVANTAGES:-

Following are the 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 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 over flow and may thus create unhygienic conditions.

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

## 4) SEPERATE 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) The sewer are smaller in section, they can be easily ventilated.

(4) Rain water can be discharged into the streams or can be reused / recycled without any treatment.

## \*1) DISADVANTAGES:-

(1) Since the sewers are of 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 costs of system is also high.

→ I will suggest combined sewerage system because both domestic sewerage and storm water are carried in a single sewer so construction cost is less and sewer is of large size, so they are easy to clean.