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Subject Wastewater Engineering

①

Q. No 1

Ans: Waste Water Engineering :-

Waste Water Engineering is the basic principles of science and engineering in which we are trying to improve the removal and disposal of human waste human communities and such that to make it reuse again it for various purposes.

Applications:

- (i) For protecting the aquatic life we should need to treated the wastewater in order to reduce ground water contamination.
- (ii) When waste water is treated then it is reuse for many purposes. to fulfill its requirements.

3) The main objectives of the wastewater treatment is that to saving water resources and promoting the reuse of water resources. So that etc is reduce & reduce the pollution of sewage and protect the environment.

4) Main application is that to provide a good sanitary environmental condition in a city.

Q. No 2

Answer:

We can find the flow rate of waste water from water consumption records from different departments. About 75% of supplied water per capita becomes waste water. <sup>if not available.</sup>

Q no 3

(3)

Ans Wastewater characterization

By characterization we can determine the nature of contaminated contaminant nature and type of contaminant that whether it is physical, chemical or biological, Physically that it is in hard form or chemically that there is any chemical or biological that there is any bacteria present in it that comes from houses, industries etc and Then design waste water treatment plant according to the nature of contaminants.

As characterization of wastewater also provides the concentration and information regarding the type of contaminants.

Q # 04

④

Answer:

## Characteristics of Wastewater:

### 1) Physical characteristics

- a) Turbidity
- b) Color
- c) odor
- d) Total Solids
- e) Temperature

### 2) Chemical characteristics

- a) chemical oxygen demand (COD)
- b) Total organic carbon (TOC)
- c) Nitrogen
- d) Phosphorous, chlorides
- e) PH
- f) Heavy Metals
- g) Trace elements
- h) Priority Pollutants.

### 3) Biological Characteristics: (5)

- a) Biological oxygen demand (BOD)
- b) Oxygen required for nitrification
- c) Microbial Population (bacteria, pathogens).

Q. NO # 5

### 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 condition.
- 5) If the whole sewage is to be disposed of by pumping it is uneconomical.

## 2) Separate Sewerage<sup>⑦</sup> 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 into the streams or can be reused / recycled without any treatment.

### Disadvantages:

- 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.

⇒ And the system that I will suggest is combined sewerage system because both domestic sewage and 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."

Complete