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SECTION : B
SUBJECT : WASTE WATER
ENGINEERING
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Q. 1.
Answer:-

Wastewater Engineering \Rightarrow .

It is the application of Engineering methods to Improve Sanitation of human Communities, Primarily by Providing The removal & disposal of human Waste treatment & reuse application For Various Purpose.

Applications:-

- (1) By disposing off treated wastewater in odor to reduce groundwater Contamination and Protect ~~off~~ aquatic life.
- (2) Wastewater engineering deals with the management of wastewater and its treatment to reuse it for Various Purpose.
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 environmental Condition in a City.

→ Supplying more water to match the demand focussing mainly on the assesment and development of new water resource.

⇒ Environment Protection Pollution Control and recovery of wastewater the main application of wastewater engineering and Safeguarding of living things in the environment.

→ By disposing off treated wastewater in order to reduce ground water Contamination and Protect aquatic life

Q2 Relationship b/w Wastewater Generation and water supply:

Average daily Per Capita Consumption varies from 130 to 200 liters local use depend on.

(1) (i) Characteristic of Population
economic level of the Population determines the use of water which usually ranges from 50 to 380 litre/ capita/day. In the slum districts it usually varies from 50 to 100 litre/ capita/day. The quantity of wastewater is directly proportional to the characteristic of Population.

(2) Quality of water:-
water which is poor quality will be used less the water which is satisfactory to consume.

(3) Pressure:-
High Pressure maintained in the system results in greater use, In addition it increases losses in the leaks.

5 (4) Maintenance:- A well designed Program of ~~maintain~~ maintenance will reduce less and waste in the System (Detection of leaks Presence of Unauthorized Connection From Survey.

5 (5) Size of the City:-

Small Communities tend to have more limited Use of water Unsewered Usually less than 40l/cap/day.

Cities having water Using Industries may result in high Per Capita use Thus waste water generation increases.

(6) Metering:-

Metering of water Supplies to the Individual Users has been shown to reduce the Consumption Substantially As the Consumers has to pay in Proportion to the Quantity of water Consumed.



Q3

Importance of wastewater characterization!

Because of changing wastewater characterization and imposition stricter limits is being placed on wastewater characterization. Because process modeling is widely used in the design and optimization of biological treatment process (e.g. activated sludge) through characterization of wastewater. Particularly wastewater containing industrial waste is increasing. Important process modeling for activated sludge as it is currently concieved. Required experimental assesment of kinetic and stoichiometric constant. Fractionization of organic nitrogen, chemical oxygen demand (COD) and total organic carbon into soluble and particulate. Constituent is now used to optimize the performance of both existing and proposed new biological treatment plant. Plant design to achieve nutrients removal techniques from microbiological science such as RNA and DNA typing are being used to identify the active most of biological treatment process. Because of an understanding of the

(2) The nature of wastewater is the fundamental of the design and operation of wastewater collect treatment and reuse facilities.

Q4 Enlist Physical, chemical and biological characteristic of waste water?

Answer:-

Physical characteristic

- Odor
- Temperature
- Density
- Specific gravity
- Turbidity
- Colour.

Chemical characteristic

- PH value.
- (COD)
- organic Matter.
- Nitrogen Content.
- Chloride Content.
- Fats, oils & Greases
- Sulphides Sulphate & hydrogen gas.

Biological characteristics

Biochemical oxygen demand (BOD) oxygen required for nitrification and microbial Population

- Most of bacteria are helpful in oxidation and decomposition of Sewage.

Q5

Combine 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 large size and therefore the chances of their choking are rare it is easy to clean them.
- (4) In town with narrow streets this system is preferred.

Disadvantages:-

- (1) Initial cost is high because of large dimension of sewers.
- (2) Because of large size of sewers their handling and transporting 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) The whole sewage is to be disposed off by pumping it is uneconomical.

Separate Sewerage Systems.

⇒ Advantages

- ① Size of Sewers are generally less.
- ② Since the Sanitary Sewage and Storm water flows in separate pipes the quantity of Sewage to be treated is less.
- ③ As the Sewers are smaller in section they can be easily ventilated.
- ④ Rain water can be discharge into streams or can be reused/recycled without any treatment.

⇒ Disadvantage

- ① Since the Sewers are smaller size it is difficult to clean them.
- ② They are likely to be choked/blocked.
- ③ Initial cost is high when two separate sets are used.
- ④ Maintenance & cost of system is also high -

⇒ Sewers System depending on the area weather condition IF the area has rainy and Flood so we recommended separate Sewerage System because to not increase treatment cost.

And IF the area has not more rainy so we recommended combine Sewerage System because do not increase treatment cost and IF the area has not more rainy so we recommended combine Sewerage System because it has economical and easy to clean.