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ID # 7768

Section # B

Subject # Waste water Engineering

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Q1 What is Wastewater Engineering? Briefly describe its application in safeguarding the environment?

Wastewater 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.

Application ⁽²⁾

- 1) By disposing off treated wastewater in order to reduce ground water contamination and protect aquatic life.
- 2) Wastewater engineering deals with the management wastewater 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 the pollution of sewage & protect the environment.
- 4) Primary objective of wastewater engineering is to provide a good Sanitary environmental condition in a city.

Q2 Briefly describe the ⁽³⁾ relationship of wastewater generation with water supply of a locality?

Ans In situation where wastewater flow rate data are limited or unavailable wastewater 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 applied water, as the supplied water increases, the waste water will be more.

Q3 ⁽⁴⁾ What is the importance of wastewater characterization?

Ans A characterization of wastewater provide a wide variety of information regarding the type and concentration of contamination present.

With characterization of wastewater we determine the nature of contamination (physical, biological, chemical) and then design waste water treatment plant according to the nature of contamination.



Q4 Enlist physical chemical and biological characteristics of water water?

Ans Characteristics of ~~water~~ wastewater

Physical characteristics

Turbidity, colour, odor, total solids and temperature.

Chemical characteristics

Chemical oxygen demand (COD), total organic carbon (TOC), nitrogen, phosphorus, chlorides, sulfates, alkalinity, pH, heavy metals, trace elements and priority pollutants.

Biological characteristics

Biochemical oxygen demand (BOD), oxygen required for nitrification, and microbial population.

Q5 What are the advantages ^(b) and disadvantages of combined and separate sewerage system? Which sewerage system will you recommend for a new proposed township. Support your answer with justification?

Ans 1 Combined Sewerage System.

Advantages:

- 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 choking are rare. It is easy to clean them.
- 4) In towns with narrow streets, this system is preferred.

Disadvantage 2

(7)

- 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 increase and ultimately increase treatment cost.
- 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 unconomical.

2 Separate Sewerage ^⑧ System :

Advantages

- 1 Size of sewers is generally less.
- 2 Since the sanitary sewage and storm water flows in a separate pipe, the quantity of sewerage 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.

Disadvantage

- 1 Since the sewer 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 cost of ⁽⁹⁾ system is also high.

★ I will suggest combined Sewerage ~~st~~ system because both domestic sewerage & storm water are carried in a single sewers so construction cost is less and sewers are large size so they are easy to clean.