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QUESTION # 1:

Waste Water Engineering: it is,

the application of engineering method to improve sanitation of human communities, by providing the removal and disposal of human waste, treatment and reuse.

Application:

① by disposing off wastewater in order to reduce ground water contamination and save aquatic life.

② it deal with the management of wastewater and its treatment to reuse it.

③ The recovery of sewage is the important mean to save the water resources and promoting the reuse. it is the important measure to reduce the pollution of sewage & protect the environment.

(4) primary objective of waste water engineering is to provide good sanitation.

QUESTION # 2:

In situation where waste water flow rate data are limit or unavailable waste water estimation has to be done developed by water consumption records.

About 60-85% of supplied water per capita become waste water.

Waste water generated is dependent on fresh water supplied.

QUESTION # 3:

The importance of waste water characterization is to know about physical, chemical & biological characteristic of waste water. by mean of physical characteristics we know about the hardness and suspended solids.

by mean of chemical characteristics we know about the chemicals present in it. by mean of biological characteristics we know about the bacteria present in it.

QUESTION # 4:

Characteristic of Waste Water:

① Physical characteristics:

- * turbidity
- * colour
- * odor
- * total solids
- * temprature

② Chemical Characteristics:

- * Chemical oxygen demend (COD)
- * Total organic Carbon (TOC)
- * nitrogen
- * phosphorous, chlorides
- * PH
- * Heavy metals
- * Trace elements

(4)

* Priority pollutants.

(3) Biological Characteristics.

- * Biological oxygen demand
- * oxygen required for nitrification
- * microbial population.

QUESTION # 5:

COMBINED SEWERAGE SYSTEM:

ADVANTAGES

- * both domestic sewage & storm water are carried in single sewer so low costly.
- * strength of domestic sewer is reduced because of storm water
- * sewer are of large size chances of cracking are low and easily to clean
- * town with narrow street this system is preferred.

DISADVANTAGES

- * initial cost is high because of large dimension
- * because of large size handling and transportation is difficult.
- * due to storm water load and cost of treatment plant increases
- * due to heavy rainfall sewer may overflow and create unhygienic environment.

SEPARATE SEWERAGE SYSTEM

ADVANTAGES

- * size is smaller
- * since the sanitary sewerage & stormwater flowing a separate pipe the quantity treated is less.
- * due to smaller size they are easily ventilated.
- * rain water can be discharge into streams & can be reuse.

DISADVANTAGES

- * since the sewer are of small size it is difficult to clean
- * They are likely blocked.
- * initial cost is high when 2 separate sets are used
- * maintainance is costly

QUESTION #5: Part B:

storm water is carried in a single sewer so construction cost is less & sewer are of large size so easily to be cleaned.