

Day: MTWTF S

Date: ___/___/___

Name: Muhammad Hamza

ID # 7692

Section : A

Subject : Wastewater Engineering.

Department: BE (C).

Instructor : Engr. Nadeem Ullah

Q.No (01).

ANSWER:-

Wastewater Engineering:-

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

Applications in safeguarding the environment:-

As we know that wastewater engineering is directly related to improving environment-

* By so the applications in safeguarding the environment are given bellow;

- ①. By disposing of treated wastewater which will reduce the risk of ground water contamination & safeguarding aquatic life-

②. Wastewater normally contain 99.9% of water and 0.1% solids. The main concern about wastewater treatment is simply to reduce all or most part of this 0.1% of solids.

③. Wastewater is full of contaminants including bacteria, chemicals and other toxins. Its treatment aims at reducing the contaminants to acceptable levels to make the effluent safe for discharge back into the environment or reuse it for various purposes.

④. Various treat processes are physical, biological and chemical.

⑤. Type of treatment wastewater depends on the characteristics of generated wastewater and effluent disposal standards.

Q.No (02)

ANSWER:-

About 60% - 85% of per kepta consupcion of water become wastewater.

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-

Q.No (03).

ANSWER:-

The nature of the contaminantion present in wastewater must be determined in order to evaluate the suitability of one treatment over another.

Characterization of the wastewater, which provides a wide variety of information regarding the type and concentration of contaminants present, must be carried out

to determine the type of contamination concerned.

Also characterizing of wastewater helps in determining the type of contamination (physical, biological or chemical) which helps us in designing of wastewater treatment plants accordingly.

Q.No (04).

ANSWER:-

Characteristics of wastewater are given below;

- ①. Physical characteristics.
- ②. Chemical characteristics.
- ③. Biological characteristics.

①. Physical Characteristics:-

Physical characteristics are;

- 1- Turbidity.
- 2- Color.
- 3- Odor.
- 4- Total solids.
- 5- Temperature.

②. Chemical characteristics due to chemical impurities:-

Chemical characteristics are;

- 1- Chemical oxygen demand (COD).
- 2- Total organic carbon (TOC).
- 3- Nitrogen.
- 4- Phosphorus.
- 5- Chlorides.
- 6- Sulfates.
- 7- alkalinity.
- 8- pH.
- 9- Heavy metals.
- 10- trace elements.
- 11- priority pollutants.

③. Biological characteristics:-

Biological characteristics are;

- 1- Biochemical oxygen demand (BOD).
- 2- Oxygen required for nitrification.
- 3- Microbial population.

Q. No (05).

ANSWER:-

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 chocking 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 conditions-

5- If the whole sewage is to be disposed off by pumping it is uneconomical-

Separate 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- As the sewer are smaller in section, they can be easily ventilated-
- 4- Rain water can be discharged in to 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 choked/ blocked.
- 3- Initial cost is high, when two separate sets are used.
- 4- Maintenance cost of system is also high.

For a new proposed township

- * I will recommend combined sewerage system because the cost of construct is very low as compared to separate.
- * Also in this type of sewerage the chances of choking are rare because of its large size.
- * In narrow streets it is preferred so no more area required.
- * Maintenance cost is also very low of combined as compared to separated.