

IQRA NATIONAL UNIVERSITY

WASTEWATER ENGINEERING

MID TERM EXAM

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SECTION = (A)

MODULE= 8th SEMESTER

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(1)

Wastewater Engineering

Q#01.

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

Ans:

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. Sanitary engineering also known as wastewater engineering. Wastewater is the combination of liquid and water - transported wastes from homes, commercial buildings, industrial facilities.

Applications:

- 1) By disposing off treatment wastewater in order to reduce ground water contamination and protect aquatic life.
- 2) Primarily objective of wastewater engineering is to provide a good sanitary environmental condition in a city.

3) Wastewater engineering deals with the management of wastewater and its treatment to reuse it for various purposes.

4) 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 and protect the environment.

Q# 2:

Briefly describe the relationship of wastewater generation with water supply of a locality?

Ans:

- In situations where wastewater flow rate data 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 wastewater.
- Simply wastewater generation is dependant on supplied water as the supplied water increase, the wastewater will be more.

Q # 3:

What is the importance of wastewater characterization?

Ans:

A characterization of wastewater provides a wide variety of information regarding the type and concentration of contaminants present.

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

Q # 4:

Enlist physical, chemical and biological characteristics of wastewater?

Ans:

Characteristics of wastewater

1) Physical characteristics:

- a) Turbidity
- b) Odor
- c) Color
- d) Temperature
- e) Total solids

2) Chemical characteristics

- a) Phosphorous, chlorides
- b) P H
- c) Heavy metals
- d) trace elements
- e) Priority pollutants
- f) nitrogen
- g) Total organic carbon (TOC)
- h) Chemical oxygen demand (COD)
- i) Sulfate
- j) Alkalinity

3) Biological characteristics

- a) Biochemical oxygen demand (BOD)
- b) Oxygen required for nitrification
- c) Microbial population.

Q# 5:

What are the advantages and disadvantages of combined and separate sewerage systems? Which sewerage system will you recommend for a new proposed township? support your answer with justification?

Ans:

Combined Sewerage system

Advantages:

Easy cleaning because of larger diameter reasonable maintenance cost strength of sewage is reduced due to dilution of sewage by storm water. This system requires only one set of sewer making it economical. In towns with narrow streets, this system is preferred. Construction cost is less.

Disadvantages:

- a) Due to the inclusion of storm water, the load on the treatment plant increases and ultimately increases treatment costs.
- b) If the whole sewage is to be disposed off by pumping it is uneconomical.
- c) Initial cost is high because of large dimensions of sewers.
- d) During heavy rain the sewer may be overflow and may thus create unhygienic conditions.

Separate Sewerage System

Advantages

- Since the sanitary sewage and storm water flows in a separate pipes, the quantity of sewage to be treated is less.
- Rain water can be discharged in to the streams or can be reused/ recycled without any treatment.
- Size of sewers is generally less.
- As the sewers are smaller in section, they can be easily ventilated.

Disadvantages:

- Since the sewers are of smaller size, it is difficult to clean them.
- Cleaning of sewer is different due to their small size.
- Maintenance cost is high.
- Initial cost is high, when two separate sets are used.
- They are likely to get choked/ blocked.

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f) And they are choked or blocked in dry season by garbage.

Justification:

I will suggest 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 easily to clean.

END