

IQRA NATIONAL UNIVERSITY

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SECTION : A

MODULE : 8TH SEMESTER

Q (1)

Answer

Definition:

Wastewater treatment is a process that converts wastewater from its unusable state into an effluent that can be either returned to the water cycle with minimal environmental issues or reused for another purpose.

Importance:

Effectively, wastewater treatment plants do as described; they treat the water that goes down our drains before discharging it back into the environment.

Regardless of the efforts that are being made to install these plants worldwide, more is required. Water is one of our most important resources and its being squandered. There are multiple ways to treat wastewater, and the better the process, the higher the percentage that it can be reused before it gets dumped into the ocean.

Q (2)

Answer

Aerobic

Anaerobic

Definition

Definition

- | | |
|--|---|
| 1. Treatment is a biological wastewater treatment process which uses an oxygen rich environment. | Waste water treatment is a process where anaerobic organisms break down organic material in an oxygen absent environment. |
|--|---|

Bacteria:

- | | |
|--|--|
| Bacteria involved in the aerobic wastewater treatment are aerobes. | Bacteria involved in the anaerobic wastewater treatment are anaerobes. |
|--|--|

Air Circulation

Air is circulated in aerobic wastewater treatment tanks -

Air is not circulated in anaerobic wastewater treatment tanks -

Production Of Biogas

Aerobic wastewater treatment requires energy - Hence, they are less energy efficient -

Anaerobic wastewater treatment is an energy efficient process -

Energy Efficiency

Aerobic wastewater treatment does not produce methane and carbon dioxide

Anaerobic wastewater treatment produces methane and carbon dioxide

Examples

Activated sludge method, trickling filter, rotating biological reactors and oxidation ditch are the examples -

Anaerobic lagoons, septic tanks and anaerobic digesters are the examples of anaerobic -

Activated Sludge Process:

⇒ Microorganisms responsible for treatment are maintained in liquid suspension by appropriate mixing methods.

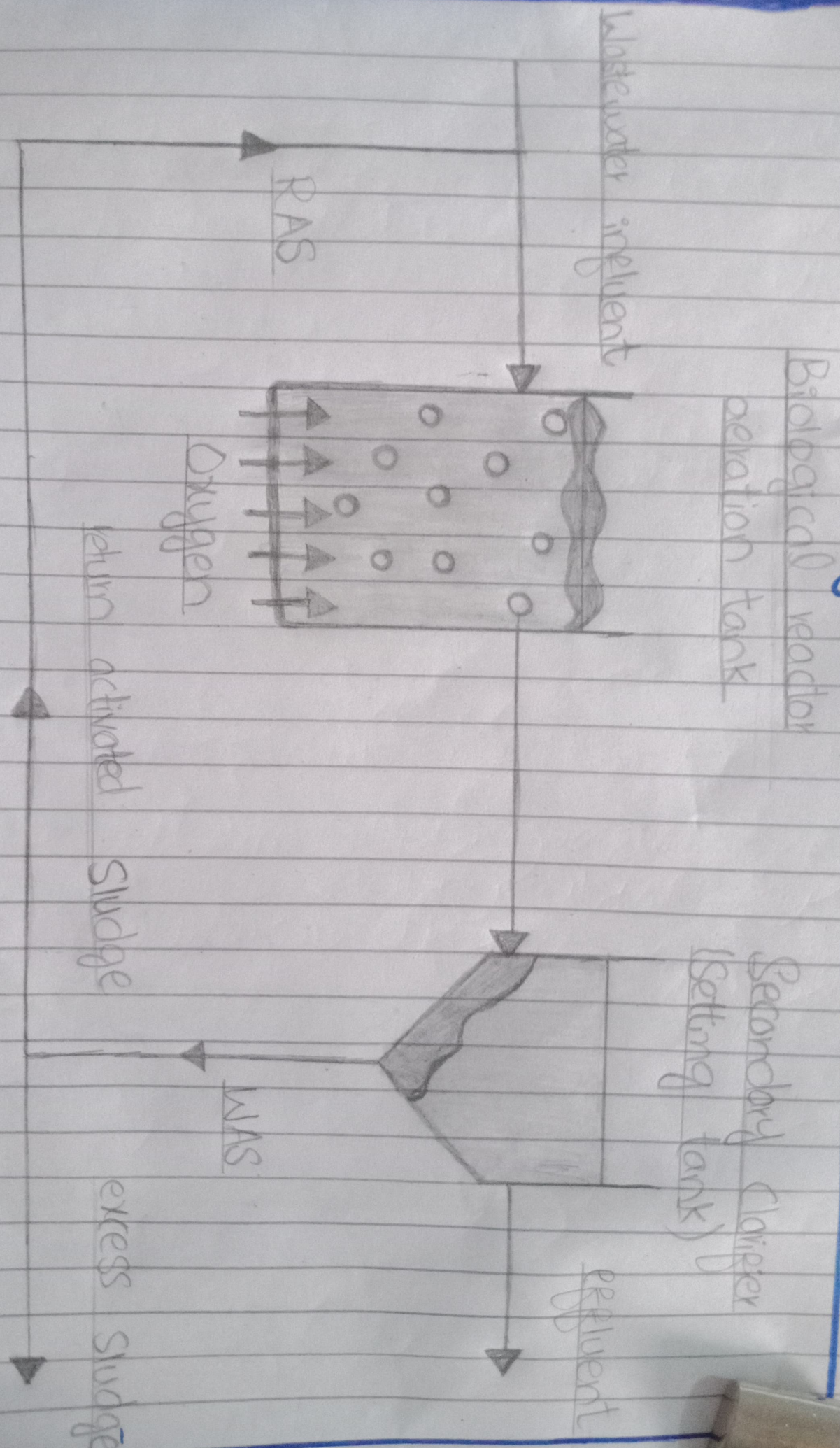
⇒ Main constituents of ASP are aeration tank in which oxygen is provided for microorganisms to grow. This aeration also helps to keep microorganisms in suspension.

⇒ Aeration tank is followed by clarifier / settler in which the micro-organisms form flocs and settled down at the bottom.

⇒ Bio flocs are recycled back to aeration tank - This is called Recycled Activated Sludge.

⇒ Removed bio flocs in system is termed as Wasted Activated Sludge.

Activated Sludge Process (ASP)



(Q3)

Assimilative Capacity of Receiving Water Bodies:

⇒ Refers to the ability of a body of water to clean itself; its capacity to receive wastewater without deleterious effects and without damage to aquatic life or humans who consume the water.

⇒ Although wastewater is properly treated before it is disposed of to the natural water streams still it has impurities/pollutants that need to be removed or make them less effective so that the receiving water bodies may not become unsuitable for use or cause damage to aquatic life.

Forces Helping Assimilative Capacity:

1) **Dilution:** Dilution is the process of reducing the concentration of pollutants in receiving water, usually simply by mixing with more quantity of water -

2) **Dispersion:** Dispersion is the distribution of pollutants in relatively large area of water -

Dilution and Dispersion are inter-related -

3) **Sunlight:** Sunlight facilitates biological decomposition of pollutants and kills pathogen by ultraviolet radiation (UV) -

(Q 4)

Answer

Sludge Management:

- Sludge management is the processes used to manage and dispose of sewage sludge produced during waste water and drinking water management.
- Sludge is mostly water with lesser amounts of solids material removed from liquid sewage.
- We can identify physical and chemical characteristics in sludge.

Treatment Processes:

Thickening :

→ Gravity and floatation.

Digestion :

→ Aerobic , Anaerobic.

Mechanical Dewatering :

→ Vacuum filtration, centrifugation.

Disposal :

→ Land application , Burial.

Advantages Of

Sludge treatment :

→ it reduces pathogens and volume to be disposed.

Protects wide life, aquatic
life and also Prevents
diseases.

Sustainable management
of organic waste.

Reduction of odors and
disease causing agents.

Producing bio - gas.

(Q5)

EIA Definition:

Environmental Impact assessment is defined as "a formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate adverse effects and to enhance positive effects".

EIA has three main functions:

⇒ To predict problems,

⇒ To find ways to avoid them,

⇒ To enhance positive effects.

My Consideration for Newly Proposed Wastewater Treatment Plant :

While conducting EIA for newly proposed wastewater treatment plant, i will suggest the following parameters:

1) Biological Oxygen Demand:

⇒ It is BOD_5 which is actual measured parameter and an indication of organic matter consumed within 5 days as from testing.

2) Chemical oxygen Demand:

The COD is an alternate measure of amount of organic matter -

This value is of greater importance when evaluating wastewater from industries -

3) Total Suspended Solids:

Effluent discharge of water must contain low level of TSS since TSS causes turbidity.

4) Total Kjeldahl Nitrogen (TKN):

The TKN indicates the amount of nitrogen of all 3 forms. TKN is useful in monitoring the plant.