01

ASSIGNMENT #02

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ID = 7724

SECTION = 'A' 8th Semester

Subject = Waste water Engineering

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02

#01

Q#01:- Hydroulic Retention Time :-

The hydroulic retention time is a measure of the average length of time that a soluble compound remains in a constracted bioreactor.

- The volume of the earation tank divided by the influent flow rate is i (ian) the hydroulic retention time.
- The hydroulic retention time is closely related to the amount of substrate that can be handled per unit time, and thereby has a direct impact on economic feasibility of bioprocess.
- A short "Hydroulic Retention time" yeilds a higher hydrogen production rate and lower capital outlay by reducing the size of the bioreaction.
- According to Borzonella David 2019 "the Hydroulic Retention time as the ratio between the reactor volume and the feed flow rate, represents the average time the cells and substance stay inside the reactor.

H.R.T is a vary importantant peramater for the hydrogen and methan production in continous mode.

Q3 #02

=> Solid Retention Time :-

The Solid retention time (SRT) is time of the Solid friction of the wastewater spad in a treatment unit it is quantity of Solids maintained in the reactor divide by the quantity of Solids leaving out the reactor each day

$$SRT = V \times \frac{cd}{cloud} \times Cout$$

Cout is the Solids concentration of the effluent in a conventional completly mixed or plug flow reactor, the HRT equal the SRT.

The Solid retention time (SRT) controls the concentration of bacteria through the treatment System.

= Small reactor size.
= Large Seperate size.
= Reduce sludge production.

#03

Q No: 2 & 7

** Methods used For Decoupling SRT from HRT

By decoupling the SRT and HRT, the liquid wastewater can be prosseced faster.

HRT is the time water is retained within the digester and is equal to reactor volume divided by the average volumetric flowrate in many instance a short HRT will reduce capital operation cost, there may have some advantage for a simple design generally reliable and easily managed.

Through modern control permits it handle off management of more complex design that decouple HRT and SRT.

Some of the more common digester types are given below.

- Continuous stirred tank reactor
- HRT Contract Reactor.
- HRT Sequencing Batch reactor
- induced load Reactor.

#04

Q No 3 :=

Advantages of Decoupling SRT from HRT :-

- HRT treatment technology has relatively low equipment cost.
- Available HRT treatment system can be applied at small as well as larger scale.
- HRT process stability can be easily achieved
- Managment requirment is low
- off-gas air pollution can be elliminated
- Foaming of Surfactant containing wastwater can be avoided.
- The HRT treatment technology does not require the impact of expensive equipment.
- HRT nutrodegradable organics can be degraded.
- less space is required for an HRT treatment plant compared to an HRT treatment plant.

End #01 ASSIGMENT