01 Waste Water TREATMENT :-

Waste Water treatment is a process used to remove contaminants from waste water or sewage and convert it into an effluent that can be returned to the water cycle with minimum impact o the environment a directly reused. The treatment process takes place in the waste water treatment plant (WWTP) often refered as water resource Recovery Facility (WRRF) or sewage Treatment plant.

=> Importance of Waste Water treatment :-

it is fundamental to protect the health of many different ecosystems. Waste Water, properly treated is a source of water for many purpose, Good Waste Water treatment allows the maximum amount of water to be reused instead of going to waste.

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=> Rectuglar & Circular shape (2)

=> Rectangular clarifiers typically require less land than circular clarifiers for a similar surface area. The reduction becomes even more significant in a multiple-unit design where common concrete wall are used :

=> Easy adaptation too high rate settlers and tolerant to shock loads.

=> Suitable to large capacity plant.

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The shape of rectangular clarifiers (Tank) provides a longer path for the wastewater flow and the suspended solid to travel and subsequently longer direction time which warrants less short circuiting and more sludge settling compared to the over flow circular clarifiers (Tank).

Q28 Activated Sludge process ?

=> Micro-organisms responsible for treatment are maintained in liquid suspension by appropriate mixing methods.

=> Main constituents to Asp are Aeration tank in which oxygen is provided for the micro-organisms to grow. This aeration also helps to keep micro-organisms in suspension.

=> Aeration tank is followed by clarifier

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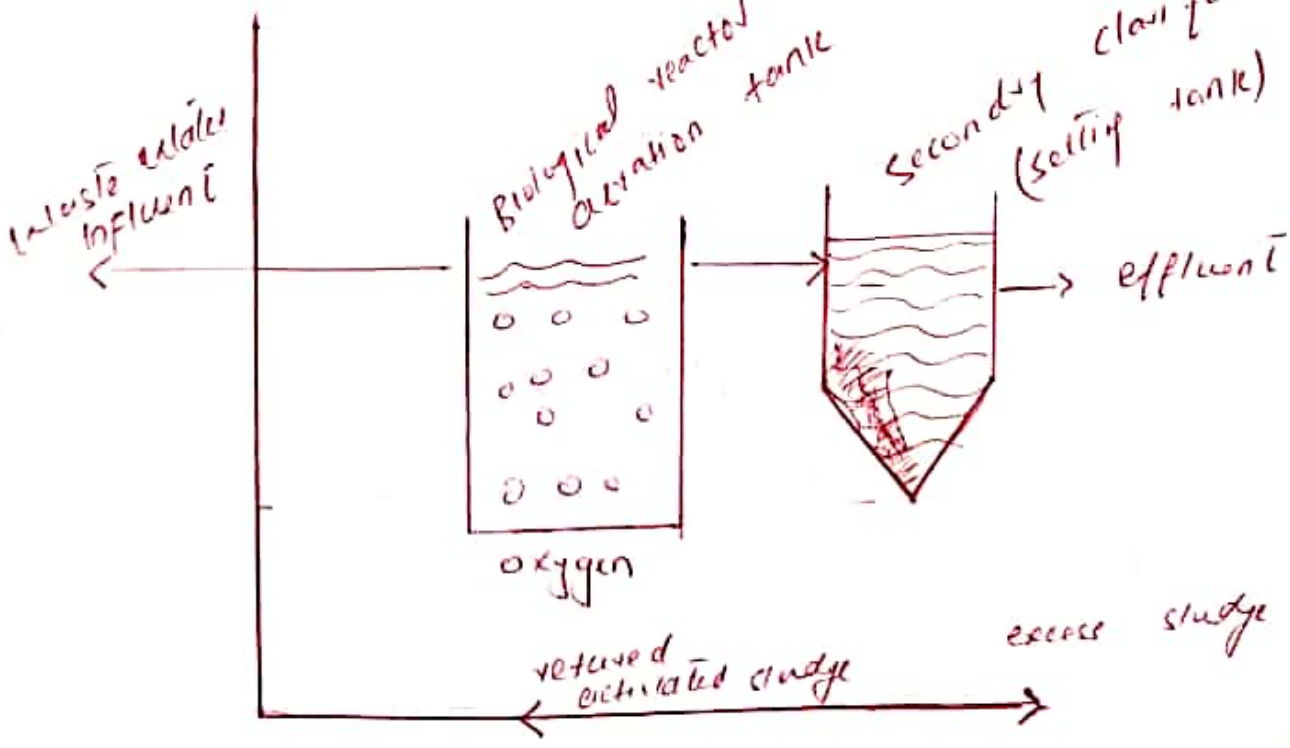
in which the micro-organisms form flocs and settled down at the bottom.

⇒ Formation of floc particles, ranging in size from 50 to 200 μm removed by gravity setting, leaving relatively clear liquid as treated effluent.

⇒ APS involves production activited of mass to micro-organisme capable of stabilizing waste under aerobic conditions.



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Difference Aerobic Treatment and Anaerobic Treatment

Parameter	Aerobic Treatment	Anaerobic Treatment
Application	low to medium strength wastewater (< 1000ppm) eg Municipal sewage, refinery waste water etc.	Medium to high strength wastewater [>4000ppm] eg food and beverage industry waste water.
=> capital investment	Relatively High	Relatively low with pay back.
=> Energy consumption	Relatively High	Relatively low
=> Foot-print	Relatively High/Large	Relatively small and compact
- Net sludge yield	Relatively High	Relatively low
= post-treatment	Typically direct discharge	Required to fulfill wastewater Standard discharge requirment.
= Example technologies	Activated sludge process Trickling Filter and Rotating Biological contractor	Anerobic Digestors (AD) continuous Stirred Tank Reactors (CSTR) Sequencing Batch reactor (SBR). Upflow Anerobic sludge Benkit (UASB) Reactors.

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Q3°- Assimilative capacity of receiving bodies?-

Ans?- it will refers to the ability of the body of water to cleanse it self. its capasity to recieve wastewater without deleterious effects and without causing damage to aquatic life or human who consume the water. it is level to which water high body or nature control the toxicity without effecting the equatic life.

=> Although waste water is properly treated before it is disposed of to the nature water stream still it has impurities/ pollutants that need to removed or make them less effective so that the receiving water bodies may not become unsuitable for use or cause damage to the aquatic life.

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= When Wastewater either treated or untreated is disposed off to the natural water bodies like river canal or some other stream it cause to pollute the water. because the presence of various pollutants in the discharge waste water. Now self assimilation of the water is that property of water to clean itself i-e with the passage of time after the waste water. is added to water quality is again ~~removed~~. improved. Now self assimition depends on factor like dispersion of pollutants in the water flow velocity temprature and sun light. Due to these parameters concentrations of added pollutants are reduced in the receiving water. bodies and thus its quality is improved. self assimulations is very important otherwise the pollutants would be great threat to the aquatic life and the people who use this water downstream of the disposal point.

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=> Also it will help in following ter
=> in short form.

=> 1) Dilution

=> 2) Dispersion

=> 3) Sunlight

=> 4) Temperature

=> 5) Depth of Flowing water.

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Q40-

Sludge Management :-

it is one of the most difficult and challging tasks of waste - water treatment plants. due to its high water content and poor dewaterbility and strict regulation for sludge reuse or dispoal. one of the recent goals of waste water treatment plants is to develp more environmentally friendly processes to reduse the volume of sludge for dispoal and to convert sludge into biogas, syngas, and boil-oil which can be further converted into electricity, mechnical energy, and heat. Sludge Dostibe the proass used to manage and dispose of sewage sludge produced during sewage treatment.

ADvantages of sludge handling managments-

1) As climate change engg is directly related to environment sludge managment is approch towards better environment.

2) Residual waste from Hospital research facilities and other industries can be hazardous to our heath and environment. These harmfull elements may require thermal treatment to control the spread of diseases or toxins. Sewage sludge incineration reduce volume (up 90%) and weight (upto 75%) and break down dangerous substances such as pathagens and toxic chemicals. Flue gases from exhaust pipes must be handled properly by utilizing a complex treatment system to prevent hazardous emissions from contaminating the environement.

3) Due to excess of new problems in sludge mangment every year new techniques and experts are emerges in waste water engg industry by face the challegens and finding the solutions.

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Q5:- 10 11

Define (EIA) Environmental Impact Assesmenti-

Ans:-

IN simple it will defined as :

=> " A formed process to predict the environmental consequences of human development activities and to plan appropiate measure to eliminate or reduce adverse effects and to enhance positive effects. "

it has three main function.

* to predict problems.

* to find ways to avoid/mitigate them, and

* To enhance positive effects.

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=> The most important parameter to be considered for a newly proposed waste-water treatment plant.

1) Biochemical Oxygen Demand :-

The BOD is the amount of oxygen consumed by aerobic microorganisms to break down the organic matter present in the waste water.

2) Chemical Oxygen Demand (COD) :-

The COD is an alternate measure of the amount of organic matter. The amount of oxygen used up by strong oxidising agent is measured.

3) Total suspended solids (TSS) :-

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TSS is measured to indicate the amount by mass of the suspended particles.

4) Total Kjehdahl Nitrogen (TKN) :-

Waste water usually contains high level of nitrogen containing compounds. The Nitrogen exists mostly in free forms. Organic nitrogen, ammonia and reduced nitrogen.

END.

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