

SUBMITTED TO

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STUDENT ID

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SECTION

B

SUBJECT :

WAST WATER ENGINEERING.

# ANSWER TO QUESTION # 01

## WASTE WATER TREATMENT :

→ Waste water treatment is a process used to remove contaminants from wastewater or sewage, and convert it into an effluent that can be returned to the water cycle with minimum impact on the environment, or directly reused.

OR.

→ Waste water 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.

→ Waste water treatment, also called Sewage Treatment.

The Removal of Impurities from a. <sup>(2)</sup>  
wastewater, or sewage before they reach  
aquifers or natural bodies of water  
such as rivers, lakes, estuaries and  
oceans. Since pure water is not  
found in nature (i.e., outside chemical  
laboratories), any distinction between clean  
water and polluted water depends on  
the type and concentration of impurities  
found in the water as well as on  
its intended use.

## IMPORTANCE of wastewater Treatment.

waste water Treatment Importance  
is to remove as much of the  
Suspended Solids as possible before.  
the Remaining water called effluent,  
is discharged back to the Environment  
As solid material decays its use



up oxygen, which is needed <sup>(3)</sup>  
by the plant and animals living  
in the water.

→ Essential for life, clean water  
is one of the most important resources.  
on the planet. Wastewater, which  
is basically used water is also  
valuable resource, especially with  
recurring droughts and water shortage  
in many area of the world. However  
wastewater contain many harmful  
substances and cannot be released  
back into the environment until it  
is treated. Thus, the importance of  
wastewater treatment is twofold: to  
restore the water supply and to  
protect from toxins.

→ The purpose of using Rectangular  
Sediment Tank.

We prefer rectangular tank ④  
because of following.

- ① Easy to operate and low maintenance costs.
- 2) Easy adaptation to high-rate. Settlers and tolerant to shock load.
- 3) Commonly used in municipal and industrial applications.
- 4) Suited to large capacity plants.

# ANSWER TO QUESTION 2.

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## AEROBIC waste water TREATMENT

- Aerobic process use bacteria that require oxygen, so air circulated throughout the treatment tank.
- These aerobic bacteria then breakdown the waste within the wastewater.
- Some system utilize a pretreatment stage prior to the main treatment to reduce the chance of clogging the system.
- Electricity is required for system operation.

## ANAEROBIC waste water Treatment.

- Anaerobic bacteria transform organic matter in the wastewater into biogas that contain large amount of methane gas and carbon dioxide.
- Energy ~~used~~ ~~to~~ efficient process.
- Often used to treat industrial wastewater that contain high level of organic matter in warm temperatures.
- It can be used as a pretreatment prior to aerobic municipal wastewater treatment.



# ACTIVATED SLUDGE PROCESS: (6)

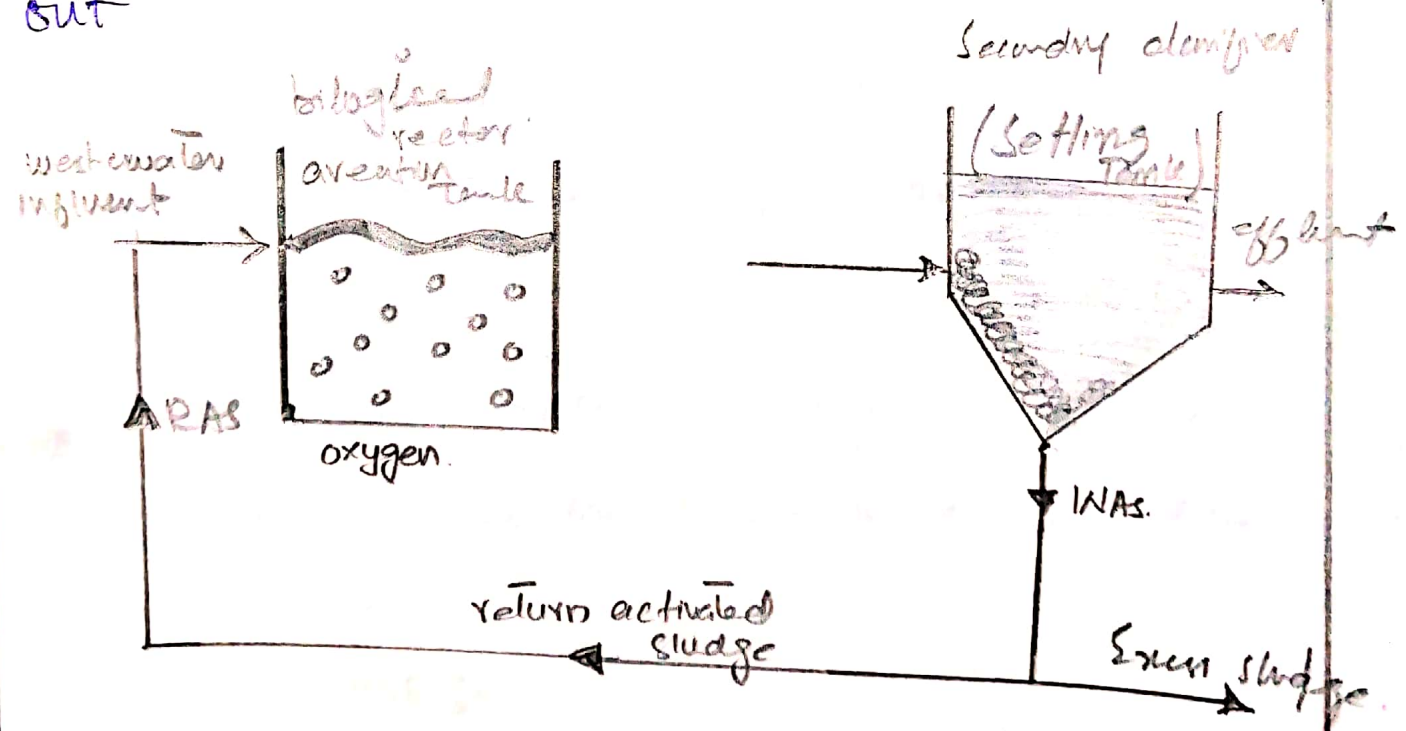
- Process for treating sewage or industrial wastewater using aeration and a biological floc composed of bacteria and protozoa.
- A biological process that can be used for oxidizing carbonaceous biological matter, oxidizing nitrogenous matter ( $\text{NH}_3$  and  $\text{N}_2$ ), removal of nutrients (N and P).
- Aeration method - diffused aeration, surface aerator (cone) and pure oxygen aeration.

## PROCESS :-

- Pre-treatment stage to remove large solids and other undesirable substances.
- Aeration stage - where aerobic bacteria digest biological wastes.

Settling stage allows undigested solids to settle form a sludge that must be periodically removed from the system.

Disinfecting stage, where chlorine or similar disinfection is mixed with water to produce an antiseptic out





# ANSWER TO QUESTION # 03.

## ASSIMILATIVE CAPACITY OF RECEIVING

### Water bodies:

→ The ability of a body of water to cleanse itself, its capacity to receive wastewater without deleterious effect and without causing damage to aquatic life or human who consume the water. It is a <sup>level</sup> to which water body or nature control the toxicity without affecting the aquatic life.

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

# ASSULATIVE CAPACITY HELPS IN WASTE WATER TREATMENT ARE:

follow are the factor which helps in assumulative water capacity.

- Sunlight
- dispersion.
- Dilution.
- Temperature
- depth of flowing water.

**Sunlight** Sun light facilitates biological decomposition of pollutants and kill pathogens. by UV.

**Dispersion:** Dispersion is the distribution of pollutants in relatively large area of water. Dilution and dispersion are inter-related.

**TEMPERATURE** Temperature play important role in assumulative capacity of receiving water. temperature increases the organics decomposes.



# ANSWER TO QUESTION 4

## SLUDGE MANAGEMENT:

→ Sludge management is most difficult and challenging task of wastewater treatment plant due to its high water content and poor de-watering and strict regulation for sludge reuse or disposal..

→ One of the recent goal of wastewater treatment plant is to develop more environmentally friendly process to reduce the volume of sludge for disposal. and to convert sludge into bio energy.

→ Energy recovery of the sludge into biogas, syngas and bio-oil which can be further converted into electricity. mechanical energy and heat.

→ Sludge Refers to the residual material left from municipal wastewater.



or industrial waste. water treatment process.

## Managing of sludge:

→ Sustainable sludge handling.

Managing may be define as.

→ A socially acceptable, cost-effective method that meets the requirement of efficient recycling of sources while ensuring that harmful substances are not transfered to humans or environment.

## ADVANTAGES:

→ As Environment Engineering directly related to Environment sludge management is approach towards a better Environment.

→ Residual waste from Industries, hospital, research facilities can be hazardous to our health and environment. These should be manage properly. because it spread diseases.

→ Sewage sludge incineration, reduce volume and weight and

break down harmful substances.

→ Due to Excess of these problems in sludge management every year new techniques and professional are emerges in waste water Engineering, industries, to face the challenges and finding the solution.

# ANSWER TO QUESTION "5"

## DEFINITION:

An Environmental study comprising collection of data, prediction of qualitative and quantitative impact, comparison of alternatives, evaluation of preventive mitigatory and management and training plans and monitoring arrangements and framing of recommendation and such other component as may be prescribed.

→ A formal process to predict the environmental consequences of human development activities and to plan appropriate measures to eliminate or reduce adverse effect and to enhance positive effects.

→ The following are the considerations should keep in mind while conducting EIA for newly proposed



## Waste water treatment plant

- Environmental damage should be minimum. Such as do not affect water body greenery and energy consumption. which effect environment should be controlled
- Environmental Benefit should be should be minimum. and water life should be controlled
- Ensure that development is according to (NEPs)
- The project should be not conflict with Govt policies.
- International obligations should be strictly followed.

Most of treatment plant have primary treatment and secondary treatment. Some other treatment plant have tertiary treatment option. The purpose of tertiary treatment

to provide a final treatment stage to raise the Effluent quality before it is discharged to receiving environment.

→ More than one treatment process may be used at any treatment plant.