Name	Obaid ur rehman
ID	7742
Paper	wastewater Engineering
Exam	Final term
SEC	A
Submitted to	Engr. Nadeemullah
Date	27-June-2020

Question - 1:

Wastewater treatment:

* Wastewater treatment is process which consist of applying known technology to improve or upgrade the quality of a wastewater.
* In wastewater treatment, First the wastewater is collected in a centralized or decentralized location (wastewater treatment plant) and then subjected to different treatment processes

Importance:

i) wastewater treatment is necessary because there is shortage of water in our country so the wastewater can be reused for several purposes after the treatment.

ii) wastewater contains contamination from both residential and commercial use. This water is harmful for living organisms and plants. So the wastewater treatment is a source to reused and clean-off this water which can be serve us for several purposes.

iii) wastewater treatment plants also allow the human and industries to disposed off their effluents without causing danger to human health or any damage to the natural environment.

iv) wastewater treatment also generate biogas as final product which is a potential source of energy.

v) most of the people die from born diseases ~~ver~~ every year, so it is very important to get the proper treatment of the water for a healthy living.

Rectangular tank preffered over circular tank for removal of settleable solids during preliminary treatment:

This is because:

i) The shape of rectangular tank provides a longer path for settleable solids to travel and subsequently longer detention time which warrants less short circuiting and more sludge settling compared to peripheral overflow circular tanks.

ii) Rectangular tank required less land than circular for a similar surface area.

iii) Rectangular tank can be built shallow (i.e 3m deep) as compared to circular tank (i.e 5.5m deep) to achieve the same effluent quality and subsequently result in cost saving.

Question - 2:

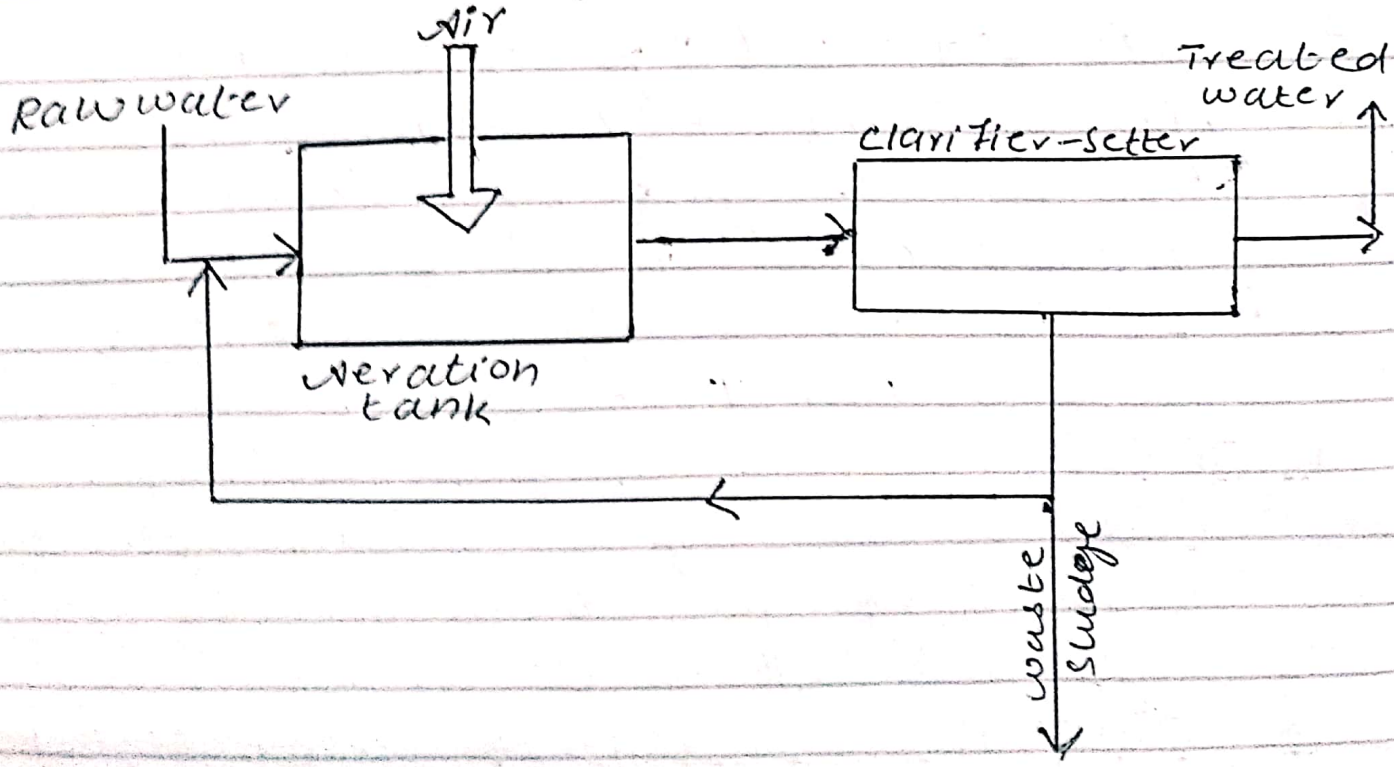
AEROBIC	ANAEROBIC
i) Aerobic waste water treatment requires oxygen, so the air is circulated in treatment tank	i) Anaerobic waste-water treatment do not required oxygen.
ii) It required electricity for system operation.	ii) It is an energy efficent process.
iii) Aerobic treatment is used as a secondary step for further reduce BOD and TSS.	iii) Anaerobic treatment is used for initial reduction of organic contaminant level.

AEROBIC	ANAEROBIC
iv) The discharge in aerobic treatment is typically direct discharge	iv) Anaerobic treatment required post-treatment to fullfill waste-water standard discharge requirement.
v) The net sludge yield in this process is relatively high	v) The net sludge yeild in this process is relatively low.
vi) Capital investment is relatively high.	vi) Capital investmend is relatively low with pay Back.

Activated sludge process:

* Activated sludge process is a process for treating sewage or industrial wastewater using aeration and a biological floc composed of bacteria and protozoa.
* It is a biological which can be used for oxidizing carbonaceous biological matter, oxidizing nitrogeneous matter (NH_3 and N_2)

* Activated sludge process is most commonly aerobic biological treatment process in which microorganisms (including bacteria, nitrifier denitrifiers) are involved in process.
* This is used as secondary treatment of medium and low strength industrial wastewaters treatments.
* This is designed and used mainly for the removal of biodegradable organic matter.
* Also designed and used even for the removal of nutrients.
* This generate waste activated sludge.
* Usually employed in conjuction with physical and chemical treatment ment for
  -> preliminary and primary treatment (primary clarifier, clariflocculator)
  -> post / advanced / tertiary treatment (disinfection, filteration etc)
* Usually receives clarified water.
  -> primary clarification is often omitted (in case of small communities for small flow and low TSS levels and in hot climates for avoiding odour problem.



Question-3

* Assimilative capicity of receving water bodies refers to the ability of a body of water to cleanse itself.
* It's capicity to recieve waste water without deleterious effects and without causing damage to aquatic life or humans who consume the water. It is level to which water body or nature control the toxicity without affecting aquatic life.
* wastewater properly treated before diposed to the natural water streams still it has impurities that need to removed, so the water bodies may not become unsuitable for use or cause damage to the aquatic life.

-> Help in wastewater treatment:

* Assimilative capicity of receving help in wastewater treatment by;
  i) The amount of wastewater disposed of in the water body so it can be safley stabilized while maintaining the desired water quality.
  ii) A certain amount of wastewater can be discharge into a reciving body, it may high un-economical to outlaw the discharge.

iii) Assimilative capicity of receiving water bodies are more easiest way of wastewater treatment as compared to other processes.

iv) ~~Assim~~ The water body absorbs constituents without exceeding a specific concentration, such as water quality.

v) The cost of wastewater treatment are less by using Assilative capicity of receiving body ~~p~~ way.

Question-4

Sludge management:

* Sludge managment consist of sludge treatment, sludge reuse, and sludge disposal.

Sludge treatment:

* Sludge treatment is used to manage and dispose of sewage sludge.
* Sludge is mostly water with lesser amount of solid material removed from liquid sewage.
* Primary sludge includes settleable solids removed during primary treatment in primary clarifier.
* Secondary sludge separated in secondary clarifier includes treated sewage sludge from secondary treatment bioreactors.
* The main purpose of sludge treatment is to reduce sludge weight and volume to reduce disposal costs, and on reducing potential health risks of disposal option.

* Sludge treatment consists of
1) Thickening.
2) Digestion
3) Mechanical Dewatering
4) Disposal.

Sludge disposal:

There is various option available for the disposal of sludge.

* Incineration of sludge is an option that is becoming less attractive because of the high cost of building and operating incinerators.

* Sludge can be dispose in water which is most common method.
* Sludge can be also disposed on land by burial or Fill.

Advantage in wastewater engineering:

Sludge management have high advantage in wastewater engineering because the sludge management give many benefits to living organism like;

i) producing Biogas which is sourse of energy
ii) protects wildlife, aquatic life and also prevent deseases
iii) Sustainable management of organic waste.
iv) stabalization of sludge.
v) Biological Phosphorus removal.

* The study of sludge management is also essential for the healthy environment also for the sevege of aquatic life.

Question-5

Environmental Impact Assesment (EIA):

EIA is a techniaue and a process by which information about environmental effects of a project is collected, both by the developer and from other sources, and taken into account by the planning authority in forming the judgement on whether the development should proceed.

Parameters:

1) Odour & Air pollution

There is a proper system availible to remove odour and air pollution from the plant and form the disposal of effluents and sludge.

2.) mosquitos:

The spray for mosquito's removed should be done because mosquito's breeding and diseases transmitted by mosquitoes

3) Climatological and meteorological conditions:

* Basic meteorological data such as wind direction and wind velocity should be kept in mind.
* Special climatic conditions such as storms, average rainfall and number of rainy days per year should be analyse.

4) Surroundings:

Surroundings around the plant should not be disturb due to plant operation.

5) Geological and hydrological conditions:

* Geological structure of the proposed area, including hydrology and aquifers should be in focus.

* Existing uses of water bodies around the plant and quality of water should be analyse.