

MID TERM PAPER.

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Subject:.. Water Supply Engineering.

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Date:.. 26/08/2020

Water Supply Engineering.

Q2): What are the various sources of municipal water supply? What parameters are considered while designing a water supply scheme?

Ans: Sources of Municipal Water Supply:

Following are the sources of municipal water supply.

1). Water on Earth.

2). Oceans and Seas.

3). Polar Ice caps.

4). Rain water

5). Ground water

6). Surface water

71. River

81. Lake

91. Spring

101. Dam

Parameters for Designing a water

Supply Scheme:-

Following are the list of design parameters in the design of water supply scheme.

11. Maximum Pressure Limits.
21. Safe Yield.
31. Negative or low Pressure head.
41. Velocity limits.
51. Natural flow.

6). Residual Head

7). Air Blocks.

8). Cost

Large system (say, 100 taps or more) are difficult to analyze mathematically and meeting some of the above parameters in a case where all the taps may open may lead to an over design of the system. In such cases an acceptable rule of thumb is to allow a flow rate of 0.02 liters per second when all of the taps are open.

Q.No: 2). Briefly Describe various types of Water Pollution and their potential Sources?

Ans.: Types of Water Pollution:

Following are the types of water Pollution.

- 1) Nutrient Pollution
- 2) Surface water Pollution
- 3) Oxygen Depleting
- 4) Ground water Pollution
- 5) Microbiological
- 6) Suspended matter
- 7) Chemical water Pollution.
- 8) Oil Spillage.

1). Nutrient Pollution:-

Some waste water, fertilizers and sewage contain high level of nutrients. If they end up in water bodies, they encourage algae and weed growth in the water. This will make the water undrinkable, and even clog filters.

2). Surface Water Pollution:

Surface water includes natural water found on the earth's surface, like rivers, lakes, lagoons and oceans.

Hazardous substances coming into contact with this surface water, dissolving or mixing physically with water can be called surface water pollution.

31. Oxygen Depleting:

Water bodies have micro-organisms. These include aerobic and anaerobic organisms.

When too much biodegradable matter (things that easily decay) end up in water, it encourages more organisms growth, and they use up more oxygen in the water.

41. Ground Water Pollution:-

When human apply pesticides and chemicals to soils, they are washed deep into ground by rain water. This gets into underground water, causing pollution underground. This means when we dig wells and bore holes to get water from underground, it needs to be checked for ground water pollution.

5/1. Microbiological:-

In many countries in the world, people drink untreated water (straight from a river or stream). Sometimes there is natural pollution caused by microorganisms like viruses, bacteria and protozoa.

6):- Suspended Matter:-

Some pollutants (substances, particles and chemicals) do not easily dissolve in water. This kind of material is called particulate matter. Some suspended pollutants later settle under the water body. This can harm and even kill aquatic life that live at the floor of water bodies.

7). Chemical Water Pollution:-

Many industries and farmers work with chemicals that end up in water. This is common with point-source pollution.

8). Oil Spillage:-

Oil spills usually have only a localized effect on wildlife but can spread for miles. The oil can cause the death of many fish and get stuck to the feathers of seabirds, causing them to lose their ability to fly.

↳ Sources of Water Pollution:-

There are various classifications of water pollution. The two chief sources of water pollution can be seen as Point and Non-Point.

1). Point Source Pollution:-

Point Source Pollution refers to contaminants that enter a waterway through a discrete conveyance, such as a pipe or ditch.

Examples:-

- discharges from a sewage treatment plant, a factory etc.
- A city storm drain.

2). Non-Point Source Pollution:

Non-Point Source Pollution (NPS)

refers to diffuse contaminations that does not originate from a single discrete source.

NPS pollution is often accumulative effect of small amounts of contaminants gathered from a large area.

The leaching out of nitrogen compounds from agricultural land which has been fertilized is a typical example.

Q No. 3). Briefly describe various types of water treatment methods! Which method will you recommend for biological contamination removal?

Ans:. Methods of Purification:

Following are the methods of Purification of water.

- 1). Screening
- 2). Plain Sedimentation
- 3). Sedimentation Aided with coagulation.
- 4). Filtration.
- 5). Aeration.
- 6). Softening.
- 7). Miscellaneous Treatment, fluoridation, recarbonation, desalination.

I will recommend Plain Sedimentation method for purification of water.

Because it is simplest of all methods.

It is time saving. It can remove upto 60% of suspended solids and 75% of bacterial load.
