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# SELF-ASSESSMENT TEST

# LESSON 1

## Answers

1. **False**

   Dissolved constituents include ions and organic compounds. Clays and other silicates, colloids and microorganisms are suspended constituents or particulate constituents.

2. **True**

   The concentrations above which water impurities and pollutants adversely affect a particular water use differ widely. They are different for drinking-water supply, industrial processes and irrigation, recreation, among others.

3. **False**

   Suspended Solids (SS) is the portion of total solids retained by a filter in a filtration. On the contrary, Dissolved Solids (DS) is the portion that passes through the filter. Volatile Solids (VS) is the fraction that is volatilized and burned off when SS or DS are ignited (550ºC). Thus, SS can be subdivided into VS and FS.

4. **False**

   Conductivity is determined by comparing the resulting voltage of two electrodes immersed in a probe of sample water when applying an alternating electrical current.

   Turbidity is determined comparing the intensity of the light scattered by a water sample to the light scattered by a reference suspension under the same conditions.

5. **False**

   The parameters that relate the organic matter content are Theoretical Oxygen demand (ThOD), Total Organic Carbon (TOC), Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD).

   Suspended Solids (SS) may include other constituents besides organic matter. Solids Yield (Y) is the amount of new cell mass created per unit of substrate removed from a wastewater.

6. **False**

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The more easily biodegradable compounds are in the wastewater, the higher the rate- velocity (k) will be. The rate of oxidation will be high and, therefore, maximum Biological Oxygen Demand ($BOD_{max}$) will be reached in a short time.

**7. True**

Inputs of oxidizable pollutants cause de-oxygenation. This decrease of oxygen is compensated by the atmospheric re-aeration. The rate of diffusion is proportional to the concentration gradient (Fick's Law describes this rate). Thus, reaeration -rate increases until de-oxygenation rate is compensated.

**8. False**

Acidity is caused by dissolved $CO_2$. Dissolved $CO_2$ is governed by a series of reversible reactions that control the pH of water. Addition of heavy metals will impact on the toxicity of the water.

**9. True**

At the critical point ($D_C$) the re-aeration rate is similar to the de-oxygenation rate, therefore, Dissolved Oxygen (DO) stops declining, registering at that point the lowest concentration of DO and greatest oxygen deficit.

**10. True**

BOD/COD indicates the ratio between biological oxygen demand and chemical oxygen demand. When BOD/COD is high, a higher proportion of biodegradable organic material is present in the wastewater.

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