WATER QUALİTY

- Water, an essential component of life, gets degraded in quality when it contains an excess of unwanted chemicals and harmful microorganisms. Water gets polluted by various causes and sources.
- Water bodies have many uses such as municipal use, agricultural, industry, fisheries, recreation etc and the term quality must be considered relative to the intended use.
- There are many aspects of water pollution and there are many variables that determine water quality for a given use.

- Water quality is an issue that relates the chemical composition of water for particular use and societal needs. The three important factors that control the quality of water are:

- Physical Factor
- Chemical Factor
- Biological Factor

Physical Factor

- Includes the dissolved and suspended solid in water body
- Plants, leaves and degraded organic material etc become the part of suspended matter
- Ions like nitrates, hydroxides and chlorides etc are completely soluble in water and called dissolved solid

Chemical Factor

- Solubility, chemical reactivity, temperature etc play important role in chemical quality of water
- High level of acidity/alkalinity, toxic and carcinogens etc degrade the water to a large extent.

Biological Factor

- Includes microorganism-cellular and microscopic bacteria
- Contaminate both ground and surface water and cause various water borne disease like diarrhoea, cholera, thypoid etc

Physical Parameters	Chemical Parameters	Biological Parameters
Temperature	Hardness	Dissolved Oxygen (DO)
Colour	Salinity	Biochemical Oxygen Demand (BOD)
Odor	Alkalinity	Chemical Oxygen Demand (COD)
Turbidity	pH	Total Organic Carbon (TOC)
Electrical Conductivity	Total dissolved solids (TDS)	

a. Physical Parameters

i. Temperature

- Temperature is an important water quality parameter because it affects the degradation rate of the biodegradable pollutants.
- Temperature also affects the level of dissolved oxygen in water.
- Sharp increases or decreases of temperature cause high adverse impacts on the ecological system.

ii. Colour

- Many surface waters are coloured, due primarily to decomposition of organics, metallic salts or coloured clays. This colour is considered as "apparent colour" as it is seen in the presence of suspended matter, whereas "true colour" is derived only from dissolved inorganic and organic matters.

- Samples can be centrifuged and/or filtered to remove turbidity in order to measure true colour.

iii. Odor

- Pure water is odorless.
- When water dissolves other substances, the odor is determined by them.
- Mostly decayed organic substances give fouling smell.
- Inorganic substances give earthy smell.

iv. Turbidity

- Turbidity is a measure of the amount of suspended particles in the water. Algae, suspended sediment, and organic matter particles can cloud the water making it more turbid.
- Suspended particles diffuse sunlight and absorb heat. This can increase temperature and reduce light available for algal photosynthesis.
- Turbidity is expressed in Nephelometric Turbidity Units (NTU) and is measured using a relationship of light reflected from a given sample.
- The term Nephelometric refers to the way the instrument estimates how light is scattered by suspended particulate material in the water.

v. Electrical Conductivity

- Ability of a substance to conduct an electrical current.
- Electrical conductivity is determined by the concentrations of ions and cations that conduct electricity.
- The presence of charged ionic speies makes water conductive.
- Directly related to temperature of water.
- Pure water is less conductive.