A by naoh solution and phenolpthalein solution

A stopper with an eyebolt attached is loosely inserted.

A cord is attached both to the eyebolt and to the wire harness. When the bottle is lowered to the desired aepth (indicated by marked line), the cord is jerked to remove the cork. Sufficient time is allowed tor the bottle to till and it is then pulled to the surface.

Dissolved oxygen:

The dissolved oxygen of water is determined by rapid Winkler's method which involves titration. This method has been described in detail by Smith (1974).

Free carbon dioxide concentration:

The concentration of free C02 in water is determined by titration by NaOH solution and phenolpthalein solution (for details see Smith, 1974).

Hardness and salinity:

Temporary hardness of water is caused by carbonate of calcium and magnesium (or by combined CO2) and is determined by titration method by HC1 solution.

Permanent hardness of water is caused by chlorides and sulphates of calcium and magnesium and is accurately measured by a colorinietric titration method. This method is based on the ability of sodium versenate (sodium diethylenediamine tetracetate) to form un-ionized complexes with calcium and magnesium. If eriochrome black T, a dark blue dye, is added to this solution containing Ca2+ and Mg2+ ions, a complex, pink in colour, is formed. By adding sodium versenate solution to this complex, the solution

can be turned back to blue again by removing Ca2+ and Mg2+ from dye complex to the versenate complex again. The end point, when the pink changes back to blue, is used as a measure of total hardness. Salinity of estuarine water is tested by titration with silver nitrate solution.

Acidity or pH value:

For the determination of pH value of water of different habitats, samples of water are collected during different months of the season, and from different places and depths. From each sample few drops of water are taken and are tested for pH value either by universal indicator, narrow-range pH papers or pH meter.

Turbidity:

Turbidity of pond water or river water is recorded with the help of Secchi disc which is a round disc with different strips of two contrast colours, white and black. The degree of in distinction between two colours in the water determines the index of turbidity of water.

For measuring the turbidity index, the disc is lowered slowly and slowly in water until black and white colours become indistinguishable and the depth is noted down. This depth indicates the turbidity index.

Temperature:

The temperature of water of different habitats is measured at different depths at different times by thermostat or by maximum and minimum thermometer. The latter consists of two thermometers, each with metallic float that in the one thermometer lodges at the highest temperature, in the

other at the lowest. For new readings the floats are reset at the top of the mercury columns, preferably with a small magnet. For recording the water temperature at different depths of pond, lake or river, to one end of thermometer is attached a measured line and to its other end a weight is attached. The reading is taken vertically from the surface to the bottom at 0.

5 or 1. 0m intervals.

Light intensity:

Light intensity of aquatic environment is measured by the use of photometer which consists of a photoelectric cell and an amperemeter. The photocell is exposed to light, and the value is read on the amperemeter, with deflection needle. The light intensities are measured in terms of lux units.

For the use of photometer in water, the photocell is sealed in a transparent waterproof case. The photocell is placed at different sites and depths of pond water to find out variations in light intensity values.

Current:

The estimates of stream flow or current is made either by current meters or by a quick method of Robin and Crawford (1954).

In latter method, a cross section of the stream is chosen where the current and depth are most uniform, and its width is measured. The width is divided into three equal segments by pushing sticks into the bottom or coloring the surface of stones. Then, the depth is recorded at the midpoint of each segment and the velocity of the surface current is determined by dropping a fisherman’s float (without projecting arms) attached to 5 ft of limp,

monofilament nylon fishing line (0 005-0 01 inch in diameter). The time required for the float to travel the 5 ft depth is recorded by a stopwatch. This is several times and the average figure recorded and converted into feet per second.

The volume of flow R can be determined for each segment of the cross section by the following formula: R = WDa V Where, a = a bottom factor constant (0. 8 for rocks and coarse gravel; 0. 9 for mud, sand, hardpan, bedrock) W = width of the segment D = depth at the midpoint of the segment V = surface current velocity taken at the midpoint of the segment Total flow is determined by adding the flows for the three segments.