Question 25 (5 marks)

What is the relationship between dissolved oxygen and biochemical oxygen demand and why is it important to monitor both in natural ways? **5**

Dissolved oxygen (DO) is the amount of oxygen (O_2) dissolved in a unit volume of water at a set temperature (usually 20°c) while biochemical oxygen demand (BOD) is a measure of the oxygen required by aerobic bacteria for the decomposition of organic matter. BOD uses DO to monitor levels in natural ways, by taking a sample of water and measuring its DO using an oxygen probe, and keeping another sample of the water for 5 days incubated without light at 20°C. The BOD = $DO_{0\,days} - DO_{5\,days}$. Thus level should roughly be at 9 ppm. It is very important to monitor levels of DO and thus BOD in natural ways as too little ~~or too much can cause~~ restricts the respiration of aquatic life, while too much can lead to increased dissolution of PO_4^{3-} and NO_3^- (eutrophication). This forms algal blooms at the surface of the water which restrict photosynthesis causing the death of aquatic plants which release toxins, making the water unsightly, odourful and not useable.