Long Answer Questions

Q.1. What are the different types of inorganic and organic impurities generally present in sewage?

[NCERT Exemplar]

Ans. Wastewater is composed primarily of natural organic substance, which are by-products of human, animal and plant processes. The primary elements in domestic wastewater are nitrogen, phosphorous, ammonia and carbon, these elements are released with the growth of bacteria in standing water. The bacteria consume the oxygen present in water and as a result, living organisms in the water start to die. We know that sewage is a complex mixture containing suspended solids, organic and inorganic impurities, nutrients, saprotrophic and disease-causing bacteria and other microbes.

Organic impurities	Human faeces, animal waste, oil, urea (urine)
Inorganic impurities	Nitrates, phosphates, metals
Nutrients	Phosphorus and nitrogen
Bacteria	Such as which cause cholera and typhoid
Other microbes	Such as which cause dysentery

Q.2. Describe various steps of cleaning wastewater in a wastewater treatment plant.

[NCERT Exemplar]

Ans. (a) Wastewater is passed through bar screens. Large objects like rags, sticks, cans, plastic packets, napkins are removed.

(b) Water then goes to a grit and sand removal tank. The speed of the incoming wastewater is decreased to allow sand, grit and pebbles to settle down.

(c) The water is then allowed to settle in a large tank which is sloped towards the middle. Solids like faces settle at the bottom and are removed with a scraper. This is the sludge. A skimmer removes the floatable solids like oil and grease. Water so cleared is called clarified water. The sludge is transferred to a separate tank where it is decomposed by the anaerobic bacteria. The biogas produced in the process can be used as fuel or can be used to produce electricity.

(d) Air is pumped into the clarified water to help aerobic bacteria to grow. Bacteria consume human waste, food waste, soaps and other unwanted matter still remaining in

clarified water. After several hours, the suspended microbes settle at the bottom of the tank as activated sludge. The water is then removed from the top.

Q.3. Give short note on alternative methods for sewage.

Ans. Every community should have a way of disposing sewage so that people, animals and flies cannot touch it. This is called a sewage system. We know that poor sanitation is the basic cause of a number of diseases. To make our sanitation get better there are different types of sewage systems which can be used such as on-site systems and sewage or effluent systems. Septic tanks, composting pits, chemical toilets, etc., are examples of on-site sewage disposal systems.