

Explain various steps involved in laying of sewers. 4 1A. 3 Describe the working and use of the catch basin with a neat sketch. 1B. 1C. Write short notes on Partial flow diagram. 3 Explain variations in sewage flow and what is its importance? 3 2A. A 300 mm diameter sewer is to flow at 0.3 depth on a grade ensuring a degree of selfcleansing equivalent to that obtained at full depth at a velocity of 0.9m/sec Find the 5 2B. required grade and associated velocity and rate of discharge at this depth. Assume Manning's rugosity coefficient n = 0.013. The variation of n with depth may be neglected. Explain with reason how the velocity in a sewer is affected by the flow variation. 2 2C. For a wastewater sample, 5-day BOD at 20°C is 200mg/1 and is 67% of the ultimate. 4 3A. What will be the 4-day BOD at 30°C 3 3B. Write a note on Relative stability. What is Detritus tank? What is its importance? 3 3C. Explain the working of a septic tank with neat sketch. 5 4A. Explain oxygen sag curve with Deoxygenation and reoxygenation curve using a neat 3 4B. sketch. What are the factors on which rate of reoxygenation depend? 2 4C. 3 5A. Define Sludge. Describe the process of sludge digestion A 6 mid sewage having BOD of 200mg/1 has to be treated such that the final effluent from a low rate trickling filter has BOD of 30mg/1 The organic loading rate is 380 4 5B. $g/m^{3}/d$ Design a low rate trickling filter assuming 30% of BOD load is removed in primary sedimentation tank. Assume depth of filter 1.5m. 5C. 3 Compare the dilution and land disposal method of sewage disposal. 3 6A. What is composting? Explain vermicomposting 4 6B. What are the different categories of biomedical wastes?