Diploma/3rd/DCE 304

2022

Environmental Engineering

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Explain in brief the various process which are generally adopted for treating public water supplies	8
	b)	Explain the various actions takes place during filtration process	7
	c)	Design a plain sedimentation tank to treat 6 million litres water per day. Take a detention period of 10 hours and assume a depth of 2.5 m	5
2.	a)	Find the settling velocity of silica particles of specific gravity 2.65 at 20° C, if the diameter of particles is 0.002 cm	3
	b)	Derive Stoke's law for settlement of discrete particles in water	7
	c)	What do you understand by coagulation and flocculation? What are the various factors affecting coagulant? Describe various types of coagulant commonly uses in water treatment plant	10
3.	a)	Classify various types of filters. Differentiate between the slow sand filter and rapid sand filter	8
	b)	A city has a population of 80000 with an average rate of demand of 160 litres per head per day. Find the area of rapid sand filters. Assume an average filtration rate of 5000 litres per hour per m^2 of filter area	8
	c)	Define the term self-cleansing velocity and non-scouring velocity	4
4.	a)	Calculate the velocity of flow and discharge in a sewer of circular section having diameter of 1 m, laid at the gradient of 1in 500. Use manning formula taking N= 0.013. Assume sewer is running half full.	6
	b)	Discuss the mechanism of working of oxidation pond	4
	c)	Explain the working of rapid sand filter with a neat sketch	10
5.	a)	Explain the various factors affecting self-purification of polluted streams	7
	b)	A sewer of 0.6 m diameter, laid at a gradient of 1 in 400 runs full using	6

manning's formula, calculate the velocity of flow and the discharge

c) Explain the clarification in a water treatment. Explain the mechanism of floc formation 7

6. a) Mention the important factors considered for selecting materials for sewer 4

b) A settling tank of 20 m in diameter with 3 m water depth. For a water flow of 15,000 m^3 per day. Calculate i) surface area and volume of tank ii) detention time 6

c) What is meant by disinfection of water and disinfectants? What are the requirements of good disinfectants? Briefly explain various methods of disinfection of water 10