Name: **Enrolment No:**	

UPES

End Semester Examination, December 2024

Course: Water & Waste water Treatment **Semester: V**

Program: B.Tech (Sustainability Engineering) **Time : 03 hrs**

Course Code: SUEN3002 **Max. Marks: 100**

Instructions: Not Applicable

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Describe the objectives of sludge thickening in wastewater treatment.	**4**	**CO1**
Q 2	Explain major operational challenges encountered in wastewater treatment plants.	**4**	**CO2**
Q 3	Define sludge dewatering. List the commonly used methods for sludge dewatering.	**4**	**CO2**
Q 4	Identify the various biological stages involved in the process of anaerobic sludge digestion.	**4**	**CO3**
Q 5	Describe membrane filtration and its applications in wastewater treatment.	**4**	**CO3**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Define water filtration. Discuss various types of sand filters used in water treatment and their operational mechanisms. Or Discuss the coagulation process in water treatment. List the different types of coagulants used and provide a detailed explanation of the coagulation mechanism.	**10**	**CO4**
Q 7	Describe activated sludge processing focusing on the plug flow and complete mix treatment methods.	**10**	**CO3**
Q 8	Calculate the volume of a sedimentation basin in gallons, given its dimensions: 80 feet in length, 25 feet in width, and 14 feet in depth. Include the formula and a detailed explanation of the calculation.	**10**	**CO4**
Q 9	Explain the working principle of Rotating Biological Contactors (RBCs) in wastewater treatment. Include a labeled diagram of an RBC system and provide a detailed explanation of its components and operation.	**10**	**CO2**

SECTION-C (2Qx20M=40 Marks)			
Q 10	Discuss the different grit chambers and explain their working mechanisms with a diagram. Add a note on the processes of grit cleaning and disposal in wastewater treatment. Or Describe the disinfection of water. Explain key methods, types of disinfectants, and their reactions in water treatment.	**20**	**CO3**
Q 11	Explain the principle and operation of a trickling filter. Design a trickling filter using the National Research Council (NRC) equation, detailing the key parameters, and equation, and illustrating its application.	**20**	**CO4**