

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2019****Subject Code: 2151303****Date: 06/06/2019****Subject Name: Physico - Chemical Treatment Technologies****Time: 02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

		MARKS
Q.1	(a) Explain the procedure for statistical analysis of wastewater flowrate data.	03
	(b) Why are screens necessary before the treatment of wastewater? How are they classified?	04
	(c) Draw a neat sketch of conventional water treatment plant and explain the function of each unit.	07
Q.2	(a) Explain the concept of “Break point Chlorination”.	03
	(b) Enlist the different types of mixing equipments and explain any one with sketch.	04
	(c) Explain the jar test procedure for determining the optimum dose of chemical coagulant. What is the relationship between pH, Alkalinity and the alum dose.	07
OR		
	(c) Define physical characteristics of water and wastewater. Enlist and explain all the physical parameters along with their sources and effects.	07
Q.3	(a) Enlist and explain the factors affecting the process of chlorination.	03
	(b) Write a short note on Aerated Grit Chamber.	04
	(c) Derive the Stokes law for finding the terminal settling velocity of discrete particles. Which relationship will be used if the type of flow is turbulent flow?	07
OR		
Q.3	(a) Write a short note on ‘Filter backwashing’.	03
	(b) Enlist and explain the mechanisms by which the colloids are stabilized.	04
	(c) Explain the four types of settling phenomena in water and wastewater treatment. Explain clearly the difference between them.	07
Q.4	(a) What are the advantages of dual media filters as compared to single media filters?	03
	(b) Explain the coagulation theory for removal of colloids.	04
	(c) Prepare a list of different types of chemical coagulants and explain any two along with chemical reactions.	07
OR		
Q.4	(a) Write a note on “Operational difficulties of RSF”.	03
	(b) Enlist and explain the mechanisms of filtration in a Rapid Sand filter.	04
	(c) Draw a neat sketch of Rapid Sand Filter and explain its construction and working.	07
Q.5	(a) What are the functions of under drainage systems?	03
	(b) Describe the methods normally used to process the sludge before its final disposal.	04

- (c) Describe the usual sources of sludge and the characteristics of sludge generated in a conventional wastewater treatment plant. **07**

OR

- Q.5** (a) Discuss the objectives of treatment of sludge. **03**
(b) Explain sludge thickening. **04**
(c) Specify the significance of the Volume-Weight relationship of the sludge in design of sludge handling facility. **07**
