

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2161304

Date:14/05/2019

Subject Name:Biological Processes for Wastewater Treatment

Time:10:30 AM TO 01:00 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) State the objectives of Biological Waste-Water Treatment.	03
	(b) Differentiate between: Aerobic & Anaerobic treatment process for wastewater treatment	04
	(c) Draw the BOD progression curve and explain the different phases of it.	07
Q.2	(a) Differentiate between BOD, COD & TOC.	03
	(b) Define: (1) Specific growth rate (2) Yield coefficient (3) Endogenous decay coefficient (4) Maximum substrate utilization rate constant	04
	(c) Enlist and explain the factors affecting the BOD test.	07
	OR	
	(c) Write down the mass balance for CFSTR with recycle and hence Derive the equation for finding biokinetic constant.	07
Q.3	(a) Write a brief note on “bulking of sludge in ASP”.	03
	(b) Explain the mechanism by which substrate removal takes place in suspended growth process.	04
	(c) Highlight the importance of BOD for environmental engineers	07
	OR	
Q.3	(a) Describe with sketches the treatment of waste water by activated sludge process. Mention the advantages and disadvantages of this system.	03
	(b) Give the brief classification of various Biological treatment processes used for Wastewater Treatment.	04
	(c) Enlist and explain the advantages and disadvantages of anaerobic treatment processes.	07
Q.4	(a) Differentiate between the Oxidation Ditch & oxidation Ponds.	03
	(b) Explain in detail anaerobic sludge digestion.	04
	(c) Enlist and explain the basic steps involved in the overall anaerobic oxidation of a waste.	07
	OR	
Q.4	(a) Write a short note: Bio-towers.	03
	(b) Discuss the mechanism of working of UASB with neat sketch.	04
	(c) Enlist the factors affecting the performance of aerators and describe anyone in brief.	07

- Q.5** (a) Explain the types of aerators. **03**
(b) Enlist the major problems faced by small communities to treat the domestic wastewater **04**
(c) Discuss the fundamental considerations in the application of natural treatment systems. **07**

OR

- Q.5** (a) Enlist the different types of natural treatment systems used for small community. **03**
(b) Write a brief note: Root zone treatment **04**
(c) Write a detailed note on: packaged treatment plants **07**

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