

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – WINTER 2023****Subject Code:3163510****Date:02-12-2023****Subject Name:Waste Water Treatment- III****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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Write wastewater discharge limits for following parameters for disposal in ocean. 1. Biochemical oxygen demand 2. Chemical oxygen demand 3. Dissolved oxygen	03
	(b) Explain the different objectives of biological treatment.	04
	(c) Write a note on role of microorganism in wastewater treatment.	07
Q.2	(a) Define the following: 1. Endogenous decay coefficient 2. Half velocity constant 3. Yield coefficient	03
	(b) If BOD ₅ of wastewater measured at 20 C is 250 mg/L and the reaction rate constant K is 0.35 day ⁻¹ compute the ultimate and 3 day BOD at 20 C.	04
	(c) Explain different culture media and its type for bacterial growth.	07
	OR	
	(c) Explain Bioaggrugmentation and Bio magnification in brief.	07
Q.3	(a) Explain in brief difference between MLSS & MLVSS.	03
	(b) Explain complete mix activated sludge process with a neat sketch.	04
	(c) Enlist different modifications of activated sludge process. Explain any one in brief.	07
	OR	
Q.3	(a) Define the following: 1. F/M Ratio 2. MCRT 3. Maximum substrate utilization rate	03
	(b) Explain extended aeration system with a neat sketch.	04
	(c) Enlist different types of oxidation ditch systems and explain Intermittently aerated and decanted systems.	07
Q.4	(a) Draw a neat sketch of bio tower.	03
	(b) Explain the working of fluidized bed reactor in brief.	04
	(c) Explain the working of oxidation ponds with a neat sketch.	07
	OR	
Q.4	(a) Draw a neat sketch of UASBR	03

- (b) Explain packed bed reactors in brief. **04**
- (c) Enlist five points of difference between attached growth and suspended growth process. **07**
- Q.5** (a) Enlist any three methods to reduce solids content from sludge. **03**
- (b) What do you mean by RBC? Explain its working in brief. **04**
- (c) What do you mean by stabilization ponds explain it's working in detail. **07**
- OR**
- Q.5** (a) Enlist any three methods for sludge disposal. **03**
- (b) Differentiate high rate and multi stage anaerobic digesters in brief. **04**
- (c) Explain the working of trickling filter with a neat sketch. **07**
