Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER – VI• EXAMINATION – SUMMER 2014

Subject Code: 161304 **Date: 28-05-2014**

Subject Name: Biological Process 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.**

Q.1	**(a)**	Explain the mechanism of anaerobic fermentation with a neat sketch	**07**
	(b)	Explain the objectives of biological treatment	**07**
Q.2	**(a)**	With the help of a neat sketch explain working of rotating biological contactor	**07**
	(b)	Explain in detail the procedure to calculate biokinetic constants	**07**
		OR	
	(b)	An influent from a primary settling tank containing 225 mg/L of BOD_5 is to be treated aerobically in a complete mixed reactor without recycle. Compute the minimum mean cell residence time of biomass in the reactor if the essential bio-kinetic coefficients are as follows: K_s= 60 mg/L, K= 5 d^{-1}, K_d= 0.05 d^{-1}, Y= 0.5 Assuming suitable ratio, determine design MCRT.	**07**
Q.3	**(a)**	If BOD_5 of a sample measured at 20 °C is 250 mg/L, determine the 3-day BOD at 27 °C. Assume a reaction constant K'=0.23 d^{-1} at 20 °C.	**07**
	(b)	Explain the factors affecting oxygen transfer	**07**
		OR	
Q.3	**(a)**	Define the terms: SVI, F/M, specific growth rate, yield coefficient, maximum substrate utilization rate constant, endogeneous decay coefficient, organic loading	**07**
	(b)	Explain the types of aerators	**07**
Q.4	**(a)**	Write a short note: Package plants	**07**
	(b)	Explain in detail Reed Beds	**07**
		OR	
Q.4	**(a)**	Explain chemistry of carbohydrates	**07**
	(b)	Discuss the fundamental considerations in the application of natural treatment systems	**07**
Q.5	**(a)**	Write a short note: Bio-towers	**07**
	(b)	Explain the major problems faced by small communities to treat the domestic wastewater	**07**
		OR	
Q.5	**(a)**	Explain the paratmeters affecting anaerobic digestion	**07**
	(b)	Explain the procedure to calculate the value of ultimate BOD and rate constant using Thomas method.	**07**

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