rolment No

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER - VI EXAMINATION - WINTER 2015

Subj	ect Code:161304 Date:14/12/ 2015	
Subj	ect Name: Biological Processes for Wastewater Treatment	
Time	e:2:30pm to 5:00pm Total Marks: 70	
Instru	 Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. 	
Q-1	(a) Derive the relationship to find the amount of methane per gram of COD.	07
	(b) Enlist & explain the factors affecting the BOD test.	07
Q-2	 (a) Explain the Role of microorganism in wastewater treatment. (b) Give the difference between [i] Attached Growth & Suspended Growth Process [ii] Aerobic & Anaerobic Treatment OR 	07 07
	(b) Explain Biochemistry of Carbohydrates.	07
Q-3	(a) Explain mass balance for substrate for CFSTR with recycle.	07
	(b) Enlist & explain the factors affecting the Anaerobic Treatment. OR	07
Q-3	 (a) Define the Terms: [1] F/M ratio [ii] Specific Growth Rate [iii] BOD [iv] COD [v] Sludge volume Index [vi] Mean cell residence time [vii] Biomass Growth Yield (b) Explain mass balance for microbes for CFSTR with recycle. 	07 07
Q-4	 (a) Write a short notes on [i] Step fees process [ii] Contact Stabilization (b) A Domestic sewage has a 5day BOD at 20°C is 240 mg/l. If K or K' =0.1 day⁻¹.Determine BOD for 1 day & 5 day at 13°C. 	07
	Take $\Theta = 1.135$.	
Q-4	OR (a) Give the classification of tricking filter with application of each	07
~ - ~	type.	U/
	(b) Write a short note on Bio Tower.	07
Q-5	(a) Discuss the fundamental considerations in the application of natural	07

	treatment systems.	
	(b) Explain wastewater collection system for small communities.	07
	OR	
Q-5	(a) Determine the average biomass concentration in the conventional activated sludge reactor under following conditions:	07
	[i] Flow rate= 18300 m ³ /day [ii] Influent BOD(So) = 160 mg/l	
	[iii] Effluent $BOD(Se) = 5 \text{ mg/l}$	
	[iv] Tank volume = 6100 m ³ . Where Y= 0.55, Kd = 0.04.	
	Take $MCRT = 9$ days. Also determine the F/M ratio.	
	(b) With the help of neat sketch explain the working of Rotating	07
	Biological Contactor.	