Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER–IV • EXAMINATION – SUMMER 2015

Subject Code: 741801 **Date: 01/05/2015**

Subject Name: Anaerobic Biotechnologies

Time: 2:30 pm to 5:00 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)**	Give a detailed description about anaerobic treatment as a five step process with its uses.	**7**
	(b)	How do we get the methane from the anaerobic treatment? Explain in detail.	**7**
Q-2	**(a)**	An anaerobic reactor is loaded with 1000 kg COD/day. The effluent COD is measured to be 200Kg/day. Estimate the biogas produced per day if the reactor operating temperature is 30ºC.	**7**
	(b)	Draw a neat diagram indicating the conversion of different organic substances into gaseous end products.	**7**
		OR	
	(b)	With help of neat sketches explain the UASB and IC reactor	**7**
Q-3	**(a)**	Briefly explain the factors affecting the ñRate limiting stepsò of the anaerobic process.	**7**
	(b)	Show that 1kg COD stabilized produces 0.35 cu m of methane at STP.	**7**
		OR	
Q-3	**(a)**	Define toxicity. Explain sulfide and ammonia toxicity.	**7**
	(b)	Is anaerobic treatment is suitable for low strength wastewater (< 1000 mg/LCOD)? Give your comments.	**7**
Q- 4	**(a)**	Enlist the environmental variables for anaerobic treatment.	**7**
	(b)	Briefly explain the possible methods to control the toxicity in the anaerobic reactor.	**7**
		OR	
Q-4	**(a)**	Discuss the important waste characteristics for evaluation of anaerobic treatment	**7**
	(b)	Give the comparison of Suspended growth, Hybrid growth and Attached growth Anaerobic Treatment	**7**

Q-5	**(a)**	Enlist and explain causes and control of unbalanced condition in anaerobic reactor.	**7**
	(b)	What are the obstacles to wide spread the use of anaerobic digester?	**7**

OR

Q-5	**(a)**	What are the differences between methane fermentation system and anaerobic digestion of organic waste?	**7**
	(b)	Give the difference between Expanded bed and Fluidized bed Anaerobic Treatment.	**7**

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