Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- VIIth SEMESTER–EXAMINATION – MAY/JUNE- 2012

Subject code: 170404 **Date: 28/05/2012**

Subject Name: Bioprocess Engineering-I

Time: 02:30 pm – 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.**

Q.1	**(a)**	Define Fluid. Also give classifications of fluids.	**07**
	(b)	How mass transfer occurs in fermentor?	**07**
Q.2	**(a)**	What is radial and axial mixing? Explain.	**07**
	(b)	Draw a sketch of Mixing vessel and give the role of major parts of it.	**07**
		OR	
	(b)	Write a note on: role of shear in fermentor	**07**
Q.3	**(a)**	Narrate Scale up and Scale down process.	**07**
	(b)	Discuss Dynamic method to find out K_la	**07**
		OR	
Q.3	**(a)**	What is structured model and unstructured model? Where and how does it help in control operations?	**07**
	(b)	Explain control loop strategy and need to control.	**07**
Q.4	**(a)**	Write a Note on: expert control system	**07**
	(b)	Factors for incubation control- Briefly Explain.	**07**
		OR	
Q.4	**(a)**	What are the major considerations for Stoichiometry calculations for fermentor?	**07**
	(b)	Derive suitable equation(s) for oxygen transfer.	**07**
Q.5	**(a)**	What is the major difference while handling animal cells and microbial cells in fermentation?	**07**
	(b)	Discuss main aspects of aseptic operations of fermentor.	**07**
		OR	
Q.5	**(a)**	Enlist various types of fermentor with its applications.	**07**
	(b)	Discuss mechanisms of mixing.	**07**

****