Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-VIII Examination May 2012

Subject code: 180401

Subject Name: Bioprocess Engineering II

Date: 10/05/2012 **Time: 10.30 am – 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.**
4. **The abbreviations have conventional meaning.**

Q.1	**(a)**	Define Biosensor. Give the sketch showing major components and write its function.	**07**
	(b)	Discuss the relation of Del factor and batch sterilization.	**07**
Q.2	**(a)**	Discuss the principles of FTIR and MALDI-TOF-MS.	**07**
	(b)	Discuss the terms: Lumped parameter and Distributed parameter model, Static model and Dynamic model.	**07**
		OR	
	(b)	Give the broad classification of models and explain the requirements in developing model.	**07**
Q.3	**(a)**	Enlist the equations for adsorption isotherms with nature of plots and give uses of each.	**07**
	(b)	What is selectivity and partition coefficient for extraction? Describe its role in brief and explain batch extraction process.	**07**
		OR	
Q.3	**(a)**	Discuss the mechanisms of filtrations for removal of suspended solids.	**07**
	(b)	Explain two phase extraction principle and applications.	**07**
Q.4	**(a)**	Enlist different Downstream Processes with significance of each.	**07**
	(b)	Give a brief account of various online monitoring techniques.	**07**
		OR	
Q.4	**(a)**	Write down the advantages, disadvantages and Applications of MATLAB.	**07**
	(b)	Explain principle and theory of filtration.	**07**
Q.5	**(a)**	Discuss the principle of hydrophobic chromatography.	**07**
	(b)	Two proteins of molecular weights 2.5×10^5 and 1.0×10^4 were eluted out of a gel filtration column at 220 ml and 300 ml respectively. Determine the molecular weight of a protein which elutes out a 270 ml from the column under the same conditions.	**07**
		OR	
Q.5	**(a)**	Narrate the Electric Double Layer Theory for bioseparations of charged molecules.	**07**
	(b)	Draw a chart showing classification of various chromatographic techniques.	**07**

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