Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – SUMMER • 2014

Subject Code: 170506 **Date: 31-05-2014**

Subject Name: Biochemical Engineering

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)**	State various organelles in Eukaryotic cells and their brief functions	**07**
	(b)	What are the differences between Eukaryotic and Prokaryotic cells?	**07**
Q.2	**(a)**	Deduce the Michaelis-Menten Equation of the enzyme kinetics. State the assumptions clearly.	**07**
	(b)	Classify Enzymes with examples. Show schematically how an enzyme works on a typical substrate.	**07**
		OR	
	(b)	Explain 'lock and key model' and 'Induced fit model' of enzyme – substrate reaction.	**07**
Q.3	**(a)**	Describe metabolism of cells in brief.	**07**
	(b)	State and explain various methods for measurement of microbial growth	**07**
		OR	
Q.3	**(a)**	Explain various phases of microbial growth and their biological implications.	**07**
	(b)	State and explain primary, secondary and tertiary structure of proteins	**07**
Q.4	**(a)**	Briefly describe various methods of product separation and purification operations in bioprocess industries.	**07**
	(b)	State various methods of sterilization. Discuss batch and continuous sterilization process	**07**
		OR	
Q.4	**(a)**	Discuss with a flow diagram the production of lactic acid by fermentation method.	**07**
	(b)	State the functions of each part of a fermenter with the help of a schematic diagram.	**07**
Q.5	**(a)**	Discuss with a flow diagram the industrial production of single cell protein. State the uses of single cell protein.	**07**
	(b)	Explain with a neat sketch the principle and operation of activated sludge process for the waste water treatment.	**07**
		OR	
Q.5	**(a)**	Discuss nitrogen cycle with a schematic diagram. State the importance of nitrogen cycle on our environment.	**07**
	(b)	Write a note on biogas production with special reference to biomethane.	**07**

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