Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII • EXAMINATION – WINTER 2013

Subject Code: 170506 Date: 03/12/2013

Subject Name: Biochemical Engineering

Time: 10:30 TO 01:00 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 the differences between Prokaryotes and Eukaryotes. Take one examples from each of them and write their salient features	**07**
	(b)	Discuss nitrogen cycle stating the reactions involved and schematic diagram. What is the significance of nitrogen cycle?	**07**
Q.2	**(a)**	Derive Michaelis-Menten equation for the rate of enzyme catalyzed reaction stating the assumptions. How do you determine the kinetic parameters of the above equation?	**07**
	(b)	What are the advantages of enzyme immobilization? State various physical and chemical methods of immobilization of enzymes with rough sketches.	**07**
		OR	
	(b)	Explain 'lock and key model' and 'Induced fit model' of enzyme –substrate reaction.	**07**
Q.3	**(a)**	Discuss primary, secondary and tertiary structure of proteins? What is protein denaturation?	**07**
	(b)	State and explain various methods for measurement of microbial growth.	**07**
		OR	
Q.3	**(a)**	Discuss various types of lipids with examples and functions.	**07**
	(b)	Write down Monod equation for growth. State its assumptions and limitations if any.	**07**
Q.4	**(a)**	State and Explain various methods of cell disruption for product recovery operations.	**07**
	(b)	Write a note on industrial enzymes and their applications.	**07**
		OR	
Q.4	**(a)**	Discuss with a flow diagram the production of single cell protein.	**07**
	(b)	Write a note on alkaloids and their applications.	**07**
Q.5	**(a)**	Discuss with a flow diagram the industrial production of lactic acid. State the uses of lactic acid.	**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 anaerobic digestion and biodegradation in context with biological waste water treatment	**07**
	(b)	Give examples (one each) of the following: (i) Protective protein (ii) Polysaccharide (iii) Coenzyme (iv) information biomolecule (v) cofactor (vi) solid medium (vii) biofertilizer	**07**

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