Seat No.:	Enrolment No
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GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) - EXAMINATION - SUMMER 2017

Subject Code: 2160508 Date: 05/05/2017

Subject Name: Biochemical Engineering

Time: 10:30 AM to 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.

			MARK
Q.1		Short Questions	14
	1	State the importance of pH and dissolved oxygen in a fermentation process	01
	2	Define aerobic and anaerobic fermentation process	01
	3	List the type of sterilization techniques used for sterilization of equipments	01
	4	Define containment and its importance in biochemical process	01
	5	Discuss the importance of K_L a values in fermentor	01
	6	Fluid rheology is dependant on which parameters in fermentation process?	01
	7	Define Bingham plastic fluid	01
	8	What is used to control excessive foaming in a fermentation process?	01
	9	List any two technique used to measure the cell mass in a fermentor	01
	10	Define OUR and OTR	01
	11	Define NAD and NADH	01
	12	Discuss what constitute an enzyme and its role in biochemical process	01
	13	Discuss the effect of pH on enzymes in brief	01
	14	List four basic components of a control loop	01
Q.2	(a)	Discuss various factors affecting the K_L a values in Fermentation vessels in brief	03
	(b)	Discuss the asceptic condition and how to achieve it.	04
	(c)	Explain the material of construction used in the design of fermentor	07
		OR	
0.0	(c)	Discuss the different types of spargers used for aeration in fermentor	07
Q.3	(a)	State the techniques used for giving biomass feedback in the chemostat	03
	(b)	Define multistage chemostat and state its advantages	04
	(c)	Explain the growth of a typical microbial culture in batch conditions	07
0.2	(0)	OR Discuss in brief techniques used for measurement and central of dissolved	02
Q.3	(a)	Discuss in brief techniques used for measurement and control of dissolved oxygen in aerobic processes	03
	(b)	Show the comparision between the batch and continuous culture in industrial	04
	(0)	processes	V -
	(c)	Discuss the air sterilization technique used for Aerobic fermentation process	07
Q.4	(a)	Explain in brief the problems associated with foaming during fermentation in a	03
~ ··	(44)	fermentor	
	(b)	Discuss in brief the application of variable volume fed-batch culture technique	04
	(c)	Explain the membrance processes for purification and recovery in brief	07
	ν-)	OR	-
Q.4	(a)	Explain in brief the method to monitor rate of stirring for proper fermentation in	03
-	. ,	a fermentor	
	(b)	Discuss in brief various techniques used for the determination of K_L a values in fermentor	04

	(c)	Explain cell disruption and discuss precipitation method for separation and recovery of product/cells	07
Q.5	(a)	Write a short note on drying and crystallization process for separation and purification of product	03
	(b)	Explain the basic functions of a fermentor for microbial or animal cell culture	04
	(c)	Discuss the working of Plug valve, Butterfly valve and Ball valves with diagram	07
		OR	
Q.5	(a)	Define Fluid Rheology and its importance in Fermentation process	03
	(b)	Explain in brief the range of fermentation process	04
	(c)	Dicuss the High Performance Liquid Chromatography and its application	07
