Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2161408 **Date: 08/05/2017**

Subject Name: Food Fermentation Technology

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.**

Q.1		**Short Questions**	**14**
	i)	Define fermentation and write its advantages and disadvantages	
	ii)	Give two examples of antifoaming agents	
	iii)	What is the difference between affinity chromatography and affinity elution chromatography?	
	iv)	Give any two examples of downstream processes of fermentation	
	v)	Write the E.C. number of chymosin.	
	vi)	Define critical oxygen concentration.	
	vii)	Suggest an application of amylase in food industry.	
	viii)	What is average alcohol content of wine?	
	ix)	Name any three methods of desorption for eluting the enzyme from chromatography columns	
	x)	What are different sterilization agents?	
	xi)	Name the reagent (complete name) used to screen beta galactosidase positive microorganisms	
	xii)	Which enzyme is present in Barley malt?	
	xiii)	Give mathematical derivation for del factor.	
	xiv)	Write the fullform of ATCC and MTCC. What is the role of these agencies?	
Q.2	**(a)**	State various consequences of contamination in fermentation industry	**03**
	(b)	Give the classification of wine	**04**
	(c)	Comment on criteria to be considered during formulation and optimization of media for fermentation. What problems are frequently encountered during media optimization?	**07**
		OR	
	(c)	Draw a diagram to depict parts of a fermenter. Enlist the parts and mention their function in tabular manner.	**07**
Q.3	**(a)**	What are the criteria for selection of an organism to be used for production of desirable product during fermentation?	**03**
	(b)	Draw a well-illustrated flowchart to depict iso electric focusing. Explain how it is better than conventional SDS-PAGE.	**04**
	(c)	Write in brief about important chemical components of grapes responsible for wine quality	**07**
		OR	
Q.3	**(a)**	Explain how synergisms between starter culture is crucial for yogurt preparation.	**03**
	(b)	Comment on methods of preservation of microbial cultures for use in fermentation industry.	**04**

	(c)	Give mathematical derivation for thermal destruction of essential media components during sterilization.	**07**
Q.4	**(a)**	Give significance of separation and pressing during wine manufacture	**03**
	(b)	Write in brief about microbial metabolite production	**04**
	(c)	Draw a diagram to illustrate the genetic regulation of beta galactosidase production. Explain in reference to cAMP and CAP, the regulation under the following conditions: a) Only glucose present; b) Neither glucose nor lactose present; c) both glucose and lactose present; d) Only lactose present. Give one application of the enzyme.	**07**

OR

Q.4	**(a)**	What is significance of malting during beer manufacture	**03**
	(b)	Explain how holding time can be calculated at constant sterilization temperature?	**04**
	(c)	Explain the significance of chymosin in dairy industry. Draw a flowchart to depict the expression and purification of chymosin.	**07**
Q.5	**(a)**	Explain why yeast is a better starter culture than bacteria	**03**
	(b)	Explain the methods of purification of enzyme considering its solubility as major criteria.	**04**
	(c)	Describe the relationship between reaction rate constant and sterilization temperature	**07**

OR

Q.5	**(a)**	Draw a diagram to depict preparation of an oriental fermented soybean based product.	**03**
	(b)	Explain the methods of purification of enzyme considering its molecular weight as major criteria.	**04**
	(c)	Write in detail about gassing out technique used for determination of ‘Kla value’	**07**

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