

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3161408****Date:10-07-2023****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.
4. Simple and non-programmable scientific calculators are allowed.

- Q.1** (a) State any three important parts of industrial fermenter with their functions. **03**
- (b) Which are different types of wine ? **04**
- (c) Draw a diagram to depict the functioning of Lac operon. Discuss in reference to cAMP and CAP, the status of operon when both lactose and glucose is available for the bacteria. **07**
- Q.2** (a) State why yeast is considered as a better starter culture than bacteria? **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**
- OR**
- (c) Describe the effect of dissolved oxygen concentration on amino acid synthesis by *Brevibacterium flavus* **07**
- Q.3** (a) State various applications of fermentation process in food industry. **03**
- (b) What do you mean by malolactic fermentation? **04**
- (c) Describe Richard's Graphical Integration method used for calculation of Del factor during heating and cooling . **07**
- OR**
- Q.3** (a) State various consequences of contamination in fermentation industry **03**
- (b) Write a note on "Calculation of holding time at constant temperature" during sterilization. **04**
- (c) Explain with suitable example why ammonium sulphate precipitation is better than precipitation under acidic or alkaline condition? **07**
- Q.4** (a) Define 'Design Organism'. Name the most commonly used design organism with its thermal death characteristics. **03**
- (b) Write in brief about crushing and maceration processes during wine manufacture **04**
- (c) Describe types of fermentations based on media feeding, air requirement, sophistication, metabolite, starter. **07**
- OR**
- Q.4** (a) Define fermentation. Give its advantages and disadvantages. **03**
- (b) What are different methods of preservation of microbial starter culture. **04**
- (c) Explain how formulation and optimization of media for fermentation is carried out? Also comment on frequently encountered problems during media optimization. **07**

- Q.5** (a) What are the criteria for selection of an organism to be used for production of desirable product during fermentation? **03**
(b) Write in brief about microbial metabolite production **04**
(c) Which are the important chemical components of grapes responsible for wine quality? **07**

OR

- Q.5** (a) Explain the methods of purification of enzyme considering its solubility as major criteria **03**
(b) Draw a well-illustrated flowchart to depict iso electric focusing. **04**
(c) Write in detail about gassing out technique used for determination of 'Kla value' **07**
