

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019****Subject Code: 2161408****Date: 21/05/2019****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**
- (a) Give mathematical derivation for $K_L a$ value **03**
 - (b) Draw a well labeled diagram to depict the structure of a fermenter. **04**
 - (c) Explain using a well-illustrated flowchart the steps of beer production. How the green colored beer transforms into golden yellow color? What is the significance of hops flowers in beer composition? **07**
- Q.2**
- (a) Give health benefits of wine consumption **03**
 - (b) In fermentation what do you understand by upstream and downstream processing? **04**
 - (c) Enlist various methods of protein purification **07**
- OR**
- (c) Which genes are responsible for production of beta galactosidase enzyme? Explain the regulation of genes in case of presence and/or absence of glucose and/ or lactose **07**
- Q.3**
- (a) List down applications of amylase enzyme in food industry. **03**
 - (b) What is SDS-PAGE? What is the difference between 1-D and 2-D gel electrophoresis? **04**
 - (c) Describe the concept of adsorption chromatography using an illustration. What are the disadvantages of adsorption chromatography? How does it differ from affinity elution chromatography? **07**
- OR**
- Q.3**
- (a) Comment on the following statement “The larger particles elute first during gel filtration” **03**
 - (b) What is the difference between a) curd and yogurt b) cheese and paneer **04**
 - (c) What is the difference between batch, fed batch and continuous fermentation? Draw diagram for each type of fermentation **07**
- Q.4**
- (a) Comment on the statement “The yogurt starter culture grow synergistically”. **03**
 - (b) Explain with an example the application of recombinant DNA technology in production of protein at large scale fermentation **04**

- (c) Describe the following methods of protein purification: a) ammonium sulphate precipitation b) gel filtration **07**
- OR**
- Q.4** (a) What do you understand by strain development and strain improvement **03**
- (b) Write a note on 'scale up of batch sterilization process' **04**
- (c) A better microbial strain to produce a yogurt production is required. What steps would you take to isolate it? What is the significance of strain improvement in fermentation industry? **07**
- Q.5** (a) Write a short note on antifoaming agents **03**
- (b) Draw a flowchart to depict production of tempeh, an oriental fermented food **04**
- (c) Describe types of fermentations based on media feeding, air requirement, sophistication, metabolite, starter. **07**
- OR**
- Q.5** (a) Write a short note on types of spirits **03**
- (b) Explain Richards rapid method for calculation of del factor **04**
- (c) Enlist any 14 fermented products alongwith the starter organism used for its preparation. **07**
