

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-IV (NEW) EXAMINATION – SUMMER 2021****Subject Code:3141402****Date:03/09/2021****Subject Name:Food and Industrial Microbiology****Time:02:30 PM TO 05:00 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) A bacterial cell divides every 15 minutes. The initial no. of cells is exactly 1000 bacterial cells. After 3 hours, how many bacteria are present? **03**
- (b) Explain steps of bioethanol production. Justify “bioethanol has to be denatured before made available for sale” **04**
- (c) Describe the concept and application of D value. Also explain the concept of F value and Z-value. **07**
- Q.2** (a) Define food borne infection with example **03**
- (b) Draw a flowchart to indicate the production of citric acid. Enlist its properties and applications. **04**
- (c) Describe the mechanism of action of exotoxin produced by *Vibrio cholerae* **07**
- OR**
- (c) Milk and milk products are highly perishable food items. Describe the sources of contamination in milk and milk products. Enlist the microorganisms responsible for these defects and their activity responsible for specific defect. **07**
- Q.3** (a) Draw an illustrated diagram depicting various parts of a fermenter. **03**
- (b) Explain the purification of proteins on the basis of solubility **04**
- (c) Discuss the microbial spoilage of canned products? What is the significance of 12D concept for packaging and processing of canned products? **07**
- OR**
- Q.3** (a) A chef prepared a coconut cream pie without washing his hands and contaminated the pie with 500 cells of *S. aureus*. He didn't even refrigerate the pie for 6 hrs. What would be the generation time if the final no. of cells is 3 million (3×10^6). **03**
- (b) Enlist factors affecting efficacy of heat treatment in foods **04**
- (c) Enlist the environmental and atleast 10 microbial causatives (genus and species) of spoilage of fruits and vegetables. **07**
- Q.4** (a) Write a short note on lactose intolerance **03**
- (b) Write difference between exotoxin and endotoxin **04**
- (c) What do you understand by downstream processing? In a hierarchical flowchart, depict the various methods of purification and recovery of proteins based on size, polarity, solubility, and binding. **07**
- OR**
- Q.4** (a) Draw a flowchart to depict differential centrifugation **03**
- (b) Explain how low temperature is effective in reducing microbial load in foods? **04**
- (c) Describe affinity elution chromatography. How does it differ from affinity elution chromatography? **07**
- Q.5** (a) What is the difference between primary and secondary metabolite **03**
- (b) Write a short note on food preservatives using chemicals. **04**
- (c) Explain the concept of 2dimensional electrophoresis. Justify that 2 D gel electrophoresis is better than 1D electrophoresis **07**

OR

- Q.5** (a) Draw a schematic graph indicating the growth phases of microorganisms. **03**
(b) Explain the concept of culture preservation for short term and long term **04**
(c) Describe the concept of isoelectric focusing. Explain how it is better than conventional SDS-PAGE **07**
