Seat No.:	Enrolment No.

Subject Code: 141402

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER- IV• EXAMINATION - SUMMER - 2014

Date: 16-06-2014

Subject Name: Food and Industrial Microbiology Time: 10:30 am to 01:00 pm **Total Marks: 70 Instructions:** 1. Attempt all questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. **Q.1** (a) Describe the defects in milk and milk products. Enlist the microorganisms 07 responsible for these defects and their activity responsible for specific defect. **(b)** Describe the microbial spoilage of fruits and vegetables 07 **Q.2** Describe the concept and application of D value. Determine the D value for 07 given data obtained by treating a microbial culture at 75°C for 30 min using a normal graph. Time (min) Log Cfu/ml 0 5.713 2 5.619 5 5.449 8 5.327 5.258 10 15 4.994 20 4.750 25 4.477 30 4.250 **(b)** What do you understand by food borne infection? Describe any two examples. **07** OR **(b)** Describe the mechanism of action of two types of microbial toxins. 07 Discuss the microbial spoilage of canned products? What is the significance of 07 Q.3 12D concept for packaging and processing of canned products? **07** (b) Describe a technique used to screen and isolate a lactose fermenting microorganism which would help to develop lactose free fermented dairy product. Which enzyme is produced by such microorganism? How foods can be preserved by use of high temperature? Which factors Q.3**07** determine the effectiveness of a particular heat treatment? (b) Describe various methods of preservation of microbial cultures. How does 07 glycerol acts as a cryoprotectant? Draw a flowchart to depict the preparation of 25% glycerol stock. **Q.4** (a) Draw an illustrated diagram depicting various parts of a fermenter. **07** (b) What is single cell protein? Describe its significance and production details. 07

Q.4	(a)	What is bioethanol? How it is advantageous in comparison to gasoline? Enlist substrate for bioethanol production. Describe the steps by which bioethanol is produced on large scale.	07
	(b)		07
Q.5	(a)	Draw a flow chart to represent purification and recovery of proteins based on size, polarity, solubility, and binding.	07
	(b)	Describe fed batch fermentation. Draw a diagram to illustrate the fed batch fermentation.	04
	(c)	Differentiate between gel filtration and affinity elution techniques. OR	03
Q.5	(a)	Draw a schematic graph indicating the growth phases of microorganisms. What is the difference between primary and secondary metabolite. Give example of each type of metabolite.	07
	(b)	Describe the concept of purification of protein using 2-dimensionl gel electrophoresis. What is the advantage of 2-D over 1-D gel electrophoresis.	04
	(c)	A bacterial cell divides every 30 minutes. The initial no. of cells is exactly 100 bacterial cells. After 3 hours, how many bacteria are present?	03
