Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – WINTER 2015

Subject Code: 141402 **Date:22/12/2015**

Subject Name: Food and Industrial Microbiology

Time: 02:30pm to 05:00pm **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)** Describe the defects in milk and milk products. Enlist the microorganisms responsible for these defects and their activity responsible for specific defect. **07**

(b) Describe the microbial spoilage of fruits and vegetables **07**

Q.2 **(a)** Describe the concept and application of D value. Determine the D value for given data obtained by treating a microbial culture at 75°C for 30 min using a normal graph. **07**

Time (min)	Log Cfu/ml
0	5.713
2	5.619
5	5.449
8	5.327
10	5.258
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**

Q.3 **(a)** Discuss the microbial spoilage of canned products? What is the significance of 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? **07**

OR

Q.3 **(a)** How foods can be preserved by use of high temperature? Which factors determine the effectiveness of a particular heat treatment? **07**

(b) Describe various methods of preservation of microbial cultures. How does glycerol acts as a cryoprotectant? **07**

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**

OR

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) Draw a flowchart to indicate the production of citric acid. Enlist its properties and applications. **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.	**03**

OR

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**

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