

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– IV • EXAMINATION – SUMMER - 2014

Subject Code: 141402**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.
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? Draw a flowchart to depict the preparation of 25% glycerol stock. **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-dimensional 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**
