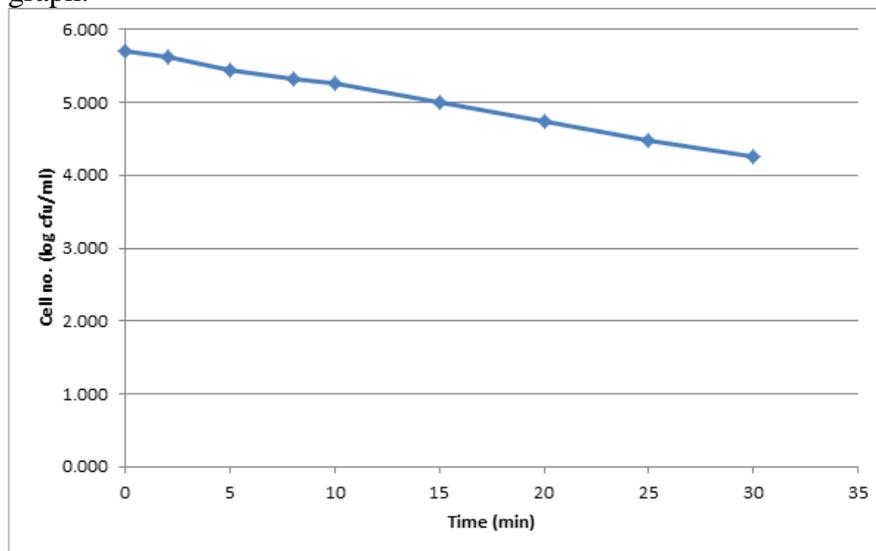


**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023****Subject Code:3141402****Date:07-07-2023****Subject Name:Food and Industrial Microbiology****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

- Q1**
- (a) Describe the concept of Z value, 12 D, F value **03**
- (b) What is the difference between sterilization and pasteurization? Name the indicator organism for sterilization and pasteurization. **04**
- (c) Describe the defects in milk and milk products. Enlist the microorganisms responsible for these defects and their activity responsible for specific defect. **07**
- Q.2**
- (a) Explain types of pasteurization methods especially the time and temperature combination. **03**
- (b) Draw a diagram to depict infection of cholera toxin in host cell **04**
- (c) 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**

**OR**

- (c) Describe foodborne infection. Draw diagrams to depict infection caused by serotypes of *E. coli*. **07**
- Q.3**
- (a) 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**
- (b) The beta galactosidase is genetically regulated by Lac operon. Explain the genetic regulation of operon responsible for production of beta galactosidase in case of 1) only glucose present 2) only lactose present 3) both glucose and lactose present 4) both glucose and lactose absent **04**
- (c) Explain the concept of 2dimensional electrophoresis. Justify that 2 D gel electrophoresis is better than 1D electrophoresis **07**

**OR**

- Q.3** (a) Draw a well-illustrated schematic diagram to depict the sub parts and probes of a fermenter **03**  
 (b) Draw a flowchart to indicate the production of citric acid. Enlist its properties and applications. **04**  
 (c) Draw a flow chart to represent purification and recovery of proteins based on size, polarity, solubility, and binding. **07**
- 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) 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**
- OR**
- Q.4** (a) Enlist factors affecting efficacy of heat treatment in foods **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**
- Q.5** (a) Enlist sources of contamination in milk during milking of cows, transport and storage. **03**  
 (b) Describe affinity elution chromatography. How does it differ from affinity elution chromatography? **04**  
 (c) Describe methods to purify protein on the basis of polarity **07**
- OR**
- Q.5** (a) Write a short note on food preservation using chemicals. **03**  
 (b) Enlist difference between exotoxin and endotoxin **04**  
 (c) Enlist the microbial causatives of spoilage of fruits and vegetables **07**

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